Appendix A

300 Area Maps

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Maps

Plate A-1. 300 Decision Area Base Map

Plate A-2. 300 Area Subregion Base Map

Plate A-3. 400 Area Base Map

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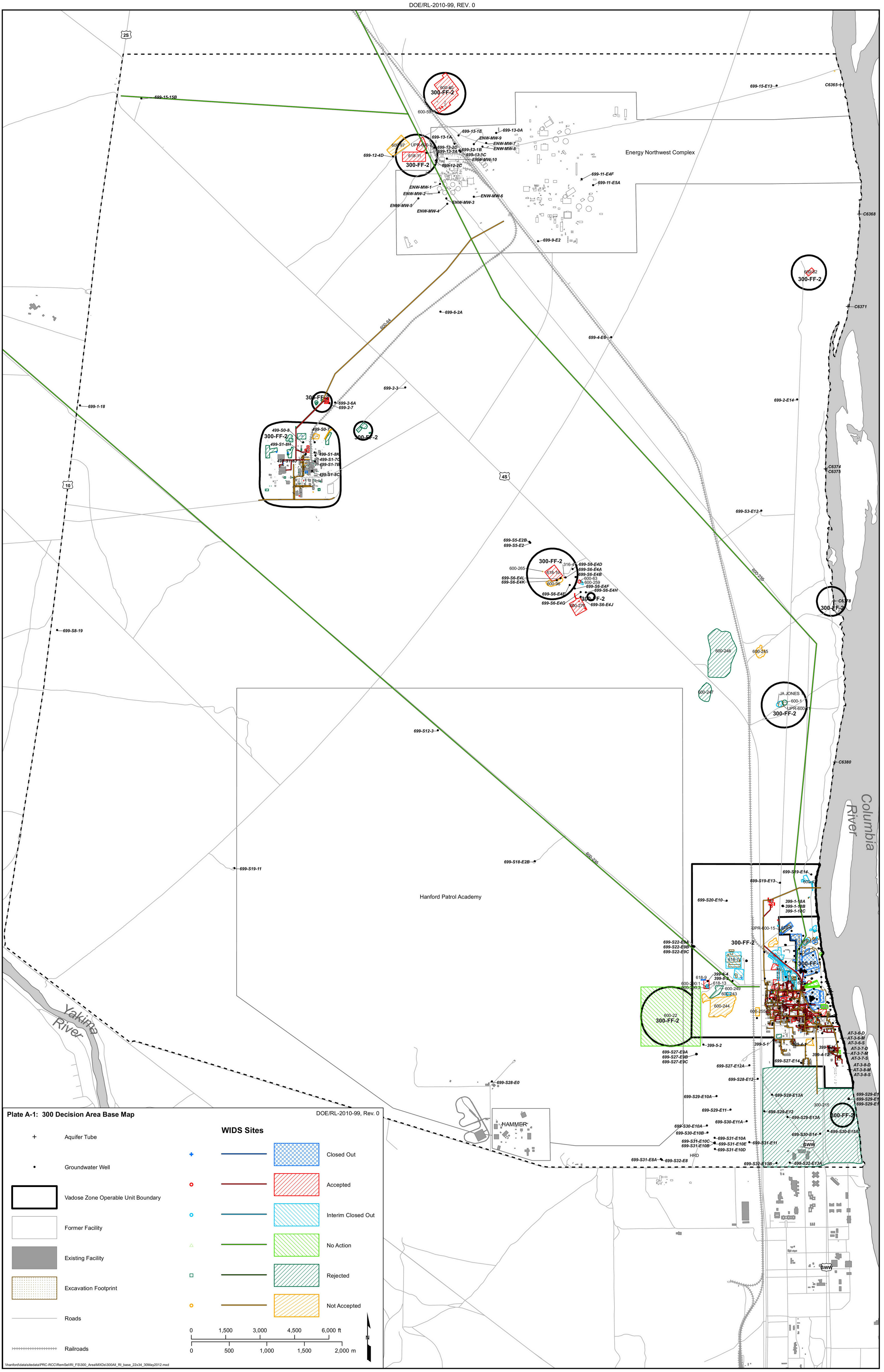

Plate A-1: 300 Decision Area Base Map DOE/RL-2010-99, Rev. 0

- Aquifer Tube
- Groundwater Well
- Vadose Zone Operable Unit Boundary
- Former Facility
- Existing Facility
- Excavation Footprint
- Roads
- Railroads

WIDS Sites

- Closed Out
- Accepted
- Interim Closed Out
- No Action
- Rejected
- Not Accepted

0 1,500 3,000 4,500 6,000 ft

0 500 1,000 1,500 2,000 m

N

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Plate A-2: 300 Area Subregion Base Map

DOE/RL-2010-99, Rev. 0

+ Aquifer Tube

• Groundwater Well

Vadose Zone Operable Unit Boundary

Former Facility

Existing Facility

Excavation Footprint

Railroads

Roads

WIDS Sites

Closed Out

Accepted

Interim Closed Out

No Action

Rejected

Not Accepted

0 75 150 225 300 ft

0 25 50 75 100 m

N

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Columbia River

600-64
400 SS
600-64
400-7
4607 4608B
499-S0-8
400 PPSS
400-5
400-6
400-8
400-2
4732-D
400-3
400-1
6508F2
400-23
480-A
480B
499-S0-7
400-24
400-9
400-19
4713C
437
MASF
4831LHWSA
400-17
300-FF-2
400-18
400-16
4843
451B
4842A
499-S1-8H
499-S1-8J
499-S1-8K
400-25
480-D
499-S1-7C
400-22
482C
4713D
400 SBT
400RFD
4817
403 FD
499-S1-7B
400 PPSS
427HWSA
400-20
400FD10A
400FD1A
400FD1B
UPR-400-1
400FD10
400-26
482A
482B
400-21
4721FD
400FD9
400FD8
400
FD2
400-9
427
4862
400-9
4713-B
HWSA
400-35
400FD7
408C
491W
405
491E
400 FD3
400 SS
4713B
4713-BFD
4713-BLDFD
402
408B
400-31
499-S1-8C
400FD4
453-A
401
4814
4713A
4701A
400FD5
400FD6
4722E
4701C
4607
400-10
400-9
4790
4722A
4760
4707
4734B
4734D
4702
400RST
400RSP
4791TC
4706
4790A
4727
400 SS
400-9
400 SS
400-35
4719
4722C
4725
4726
4727
4722B
4734C
4704N
4704S
400SS
MO378
MO379
400-9
400-35
400STF
400 SS
4722PSHWSA
4722-CFD
4732A
400-39
Percolation Basin
4732B
4732C
400-15
400-38
400-37
4722-BFD
6508F1
400-35
6224
6224A
6234A

400-4
400-13
300-FF-2
400-14

699-2-6A
699-2-7

Plate A-3: 400 Area Base Map

DOE/RL-2010-99, Rev. 0

- Groundwater Well
- Vadose Zone Operable Unit Boundary
- Former Facility
- Existing Facility
- Roads
- Railroads

0 200 400 600 ft
0 50 100 150 200 m

N

WIDS Sites

- Closed Out
- Accepted
- Interim Closed Out
- No Action
- Rejected
- Not Accepted

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Appendix B

Description and Brief History of 300 Area Waste Sites and Facilities

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Tables

Table B-1. Summary of 300 Area CERCLA Waste Sites **B-3**

Table B-2. Summary of 300 Area Facilities **B-38**

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Terms

ACL	above cleanup level
BBP	butylbenzylphthalate
BCL	below cleanup level
BHI	Bechtel Hanford, Inc.
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CHWSA	Complex Hazardous Waste Storage Area
Cr(III)	trivalent chromium
Cr(VI)	hexavalent chromium
COC	contaminant of concern
CVP	closeout verification package
CWS	contaminated waste storage
D&D	decontamination and decommissioning
DHX	Dump Heat Exchanger
DOE	U.S. Department of Energy
dpm	disintegrations per minute
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
ESHTSSA	East Side Heat Treat Salt Storage Area
FBP	Filter Backwash Pond
FFTF	Fast Flux Test Facility
FH	Fluor Hanford
FMEF	Fuels and Materials Examination Facility
FRTE	Fast Reactor Thermal Engineering
GEL	Geotechnical Engineering Laboratory
GPR	ground penetrating radar
HAMMER	Volpentest Hazardous Materials Management and Emergency Response Training and Education Center

HCBD	hexachlorobutadiene
HCE	hexachloroethane
HEPA	high efficiency particulate air
HEW	Hanford Engineering Works
hp	horsepower
HTLTR	High Temperature Lattice Test Reactor
HTS	heat transport system
HTSF	High Temperature Sodium Facility
HVAC	heating, ventilation, and air conditioning
HW	hazardous waste
HWSA	Hazardous Waste Staging Area
HWSF	Hazardous Waste Storage Facility
kV	kilovolt(s)
kVA	kilovolt-ampere(s)
LHWSA	Laydown Hazardous Waste Storage Area
LMFBR	Liquid Metal Fast Breeder
LSLDF	Life Sciences Laboratory Drain Field
LSLT1	Life Sciences Laboratory Trench #1
MASF	Maintenance and Storage Facility
MCO	multi-canister
Met Semi-Works	Metallurgical Semi-Works
NDE	non-destructive examination
NPDES	National Pollutant Discharge Elimination System
OU	Operable Unit
PCB	polychlorinated biphenyl
PIU	personal identification unit
PNL	Pacific Northwest Laboratory
PNNL	Pacific Northwest National Laboratory
PRTR	Plutonium Recycle Test Reactor
PSHWSA	Paint Shop Hazardous Waste Satellite Area

PUREX	Plutonium Uranium Reduction Extraction Facility
PVC	polyvinyl chloride
R&D	research and development
RCC	Radiation Coordinating Council
RCF	Radiological Counting Facility
RCRA	*Resource Conservation and Recovery Act of 1976*
RECUPLEX	Recovery of Uranium and Plutonium by Extraction
REDOX	reduction oxidation
RFBP	Retired Filter Backwash Pond
RL	U.S. Department of Energy, Richland Operations Office
RLWS	Radioactive Liquid Waste Sewer
RMW	radioactive mixed waste
RPS	retention process sewer
RRLWS	Retired Radioactive Liquid Waste Sewer
RSDF	Retired Sanitary Drain Field
SPP	South Process Pond
SSF	Sodium Storage Facility
SSHWSA	Sign Shop Hazardous Waste Satellite Area
SSS	sanitary sewer system
SWFL	Special Waste from Lysimeter
T&G	tongue and groove
TC	temporary construction
TCA	tetrachloroethane
TCE	trichloroethylene
TCLP	toxicity characteristic leaching procedure
TEDF	Treated Effluent Disposal Facility
TFWAST	Tank Farm Waste Acid Storage Tank
TPH	total petroleum hydrocarbon
TRF	Test Reactor Facility
TRIGA	training, research, isotopes, general atomics

TRU	transuranic
TSD	treatment, storage, and disposal
TT	treatment tank
TTL	Thermal Transient Loop
UCL	undetermined contamination level/upper confidence limit
UPR	unplanned release
UPS	uninterruptible power supply
URMA	underground radioactive material area
URO	Uranium Recovery Operations
UST	underground storage tank
V	volt(s)
VTS	Vitrification Test Site
WATS	Waste Acid Treatment System
WCH	Washington Closure Hanford
WDNR	Washington Department of Natural Resources
WIDS	Waste Information Data System

B1 Introduction

The following tables provide a complete list and brief description of 166 CERCLA waste sites located in the 300 Area. During remedial action planning, larger waste sites were occasionally segmented into smaller, manageable subunits called subsites to facilitate safe and cost effective field operations. Waste sites described in the tables include subsites.

Table B-1. Summary of 300 Area CERCLA Waste Sites

Table B-2. Summary of 300 Area Facilities

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Table B-1. Summary of 300 Area CERCLA Waste Sites

Site Code	Site Type	OU	Site Dimensions (m) OR m^2	Operation Dates	Site Description	Decision Documents	Remedial Action Start Date	Remedial Action End Date	Waste to ERDF (metric tons)	Maximum Remedial Action Depth (m)	Contaminant of Concern	Max Concentration (pCi/g, mg/kg)			95% UCL (pCi/g, mg/kg)		
												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
300 Ash Pits	Coal Ash Pit	300-FF-1	127 × 62	1944-1994	The 300 Area coal-fired powerhouse generated coal ash starting in about 1944. The ash was suspended in water slurry and sluiced to the SPP until 1951. When the coal fly ash was dry, it was hauled to several locations, including the disposal pit located west of the 300 Area. These pits received about 56,000,000 L (15,000,000 gal) per year of fly ash slurry during operations.	BHI-01132	August 1997	August 1997	No Excavation	4.6 (test pits)	Co-60	0.04	/	/	0.03	/	/
											U (total)	1.61	/	/	1.61	/	/
											As	8.20	/	/	8.81	/	/
											Benzo(a)pyrene	0.035 U	/	/	N/A	/	/
											chrysene	0.35 U	/	/	N/A	/	/
											PCBs (total)	0.26	/	/	0.25	/	/
											Thallium	5.20	/	/	5.25	/	/
300 FBP	Surface Impoundment	300-FF-1	97.5 × 65	1987-1992	The unit consists of two subsites; 300 FBP:1 and 300 FBP:2. Subsite 300 FBP:1 consists of a single, rubber-lined basin measuring 97.5 m × 65 m × 7.6 m deep. Subsite 300 FBP:2 consists of an unlined percolation pond operated from 1987 to 1992. In 1992, the pond was lined with a synthetic liner on a concrete foundation. Before the pond was lined, it received discharge of filter backwash, which was allowed to percolate to groundwater. After 1995, the backwash was held in the lined pond to clarify. The clarified water was sent to the 300 Area TEDF. The unit receives 76 million L/year (20 million gal/year) of water and alum backwashed from filters. This component of the 300 FBP is included as a "no action" site within EPA/ROD/R10-96/143. Analysis of the backwash has shown it to be nonhazardous.	EPA/ROD/ R10-96/143	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300 RFBP	Pond	300-FF-1	150 × 50	1975-1987	The 300 RFBP and the 316-1 SPP, collectively referred to as the 316-1 SPP Site, are the site of former high-volume liquid waste disposal activities located north of the 300 Area Complex, near the Columbia River. The 316-1 SPP Site was built in 1943 and was the first 300 Area process liquid disposal unit. It was originally a single, large infiltration pond to which dikes were later added, forming three settling ponds and a large main infiltration pond. The east lobe of the site was used by the 300 Area water treatment plant as a FBP (WIDS Site 300 RFBP).	CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002.	Cleaned up with 316-1. See CVP-2003-00002.	Cleaned up with 316-1. See CVP-2003-00002.	Cleaned up with 316-1. See CVP-2003-00002.	Cleaned up with 316-1. See CVP-2003-00002.	Cleaned up with 316-1. See CVP-2003-00002.	Cleaned up with 316-1. See CVP-2003-00002.	Cleaned up with 316-1. See CVP-2003-00002.	Cleaned up with 316-1. See CVP-2003-00002.	Cleaned up with 316-1. See CVP-2003-00002.	Cleaned up with 316-1. See CVP-2003-00002.
300 RLWS	Radioactive Process Sewer	300-FF-2	850 m^2	1979-1998	The 300 Area RLWS consists of a network of underground, double-encased stainless-steel pipe (encased in reinforced-fiberglass or plastic pipe as secondary containment) draining to the 340 Complex. The sewer system is designed to transfer radioactive liquid wastes from the generating facilities to the 340 Complex. Contaminants would include uranium, acids, bases, metals, solvents, and fission products. Contaminated soil and piping is ~7928.7 m^3 (280,000 ft^3).	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300 RRLWS	Radioactive Process Sewer	300-FF-2	<0.1 m (dia.)	1954-1975	The 300 Area RRLWS is a network of single-walled stainless steel piping and carbon steel fittings buried between 3 and 6 m (10 and 20 ft) below grade. The unit received radioactive wastes from various 300 Area facilities including the fuel fabrication and R&D laboratories. Wastes discharged to the sewer included water and small quantities of chemicals, decontamination solutions, aqueous fuel fabrication solutions, acids, and bases. Contaminants of potential concern would include uranium, mercury, acids, bases, fission products, metals, and solvents.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300 VTS	Process Unit/Plant	300-FF-2	105 × 85	1983-1986	The site was used in the 1980s and 1990s as a field demonstration site for the vitrification of soils containing waste simulates. Tests using PCBs and limited tests with very low levels of radioactivity were also conducted.	CVP-2005-00009	December 2004	8/22/ 2005	10	Not documented	Am-241	0.22 U	/	/	0.11 U	/	/
											Cs-137	0.031	/	/	0.024	/	/
											Co-60	0.039 U	/	/	0.017 U	/	/
											Pu-238	0 U	/	/	0 U	/	/
											Pu-239/240	0 U	/	/	0.067 U	/	/

Table B-1. Summary of 300 Area CERCLA Waste Sites

Site Code	Site Type	OU	Site Dimensions (m) OR m^2	Operation Dates	Site Description	Decision Documents	Remedial Action Start Date	Remedial Action End Date	Waste to ERDF (metric tons)	Maximum Remedial Action Depth (m)	Contaminant of Concern	Max Concentration (pCi/g, mg/kg)			95% UCL (pCi/g, mg/kg)		
												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
											Ru-106	0.29 U	/	/	0.13 U	/	/
											Sr-90	-0.046 U	/	/	-0.017 U	/	/
											PCB	0.0013 U	/	/	ND	/	/
300-1	Dumping Area	300-FF-2	Not documented	Not documented	The area was used by North Richland residents to conduct automotive repairs and recreational activities. No evidence exists that radiological contamination may be at the site. Debris removed from the area in late 1993 included empty bottles, lumber, empty cans of automotive oil, 19 L (5 gal) cans and buckets, an 46 cm (18 in.) wooden wire spool, an automotive front grill, old automotive oil filters, etc. Because of the culturally sensitive issues in this area, the decision makers associated with DOE/RL-96-42 concluded that no further action would be necessary at this site.	CCN 066141	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-2	Trench	300-FF-2	Not documented	1965-1966	About 189,250 L (50,000 gal) of secondary cooling water and other contaminated water containing 33 mCi of I-133 and 12 mCi of I-131were disposed of to ground. About 10 µCi of alpha emitters (calculated as Pu-239) and about 40 mCi of non-volatile beta emitters plus ruthenium were transferred to the trench during the first 36 hours of the incident. A few short pumpings were made after that; however, the total volume and radioisotopic inventory are insignificant in comparison to those during the first 36 hours.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-3	Burial Ground	300-FF-1	657 m^2	Not documented	The 300-3 Aluminum Hydroxide Site was identified during installation of a sump pit for the 300 Area TEDF. The site consists of several horizontal 0.3 to 0.45 m (1 to 1.5 ft) dia. Cedar logs forming a vertical wall approximately 3 m (10 ft) high running in a north south direction.	EPA/ROD/ R10-96/143	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-4	UPR	300-FF-2	19.5 × 21.3	1943-1990	The site consists of the contaminated soil inside the southwest corner of the fenced (active) electrical substation. The waste is uranium-contaminated soil. According to the referenced document, there is a potential for spillage of PCB to the soil. This statement was based on four samples that contained PCBs in the range of 1 to 3 mg/kg. EPA (2001) also lists solvents as a potential contaminant at this site.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-5	UPR	300-FF-2	1,892 L capacity	Unknown-1992	The site was two underground fuel tanks, the pump island, ancillary piping, and contaminated soil. An unknown quantity of contaminated soil, under the fuel dispensing island at the 3709-A Building (300 Area Fire Station) was discovered on 4/10/1992. These tanks were removed on 4/14/1992.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-6	Storage Tank	300-FF-2	64 × 8	1964-1998	The four concrete bunkers (USTs) were removed during summer 2001. In September 2001, the soil adjacent the sidewalls of the bunkers were separated into two categories: soil that visually appears to be contaminated with hydrocarbons and soil that visually appears not to be contaminated with hydrocarbons. The soil was staged to await sampling and disposition.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-7	Burial Ground	300-FF-2	83 × 75	Not documented	The site contains solid construction debris, such as concrete, metallic waste, asbestos, and uranium contamination. Surface debris piles can be seen and subsurface disturbances have been identified with GPR. Currently, the site is covered with natural vegetation.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-8	Dumping Area	300-FF-2	350 × 100	1962-1971	The site consisted of six irregularly shaped soil contamination areas. The area was used to stage aluminum scrap from fuel fabrication operations to be sold to salvage contractors.	CVP-2005-00007	December 2004	May 2005	39,750	0.6	Be	0.65	/	/	0.57	/	/
											U (total)	3.175	/	/	1.622	/	/

Table B-1. Summary of 300 Area CERCLA Waste Sites

Site Code	Site Type	OU	Site Dimensions (m) OR m^2	Operation Dates	Site Description	Decision Documents	Remedial Action Start Date	Remedial Action End Date	Waste to ERDF (metric tons)	Maximum Remedial Action Depth (m)	Contaminant of Concern	Max Concentration (pCi/g, mg/kg)			95% UCL (pCi/g, mg/kg)		
												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
300-9	Burial Ground	300-FF-2	Not documented	1943-1945	The location of the site referred to as the Early Burial Ground is not well documented. Uranium-contaminated aluminum shavings are scattered on the surface of the site. Other surface contaminants may include aluminum-silicon alloy and beryllium-contaminated aluminum. Actual burial inventory is unknown. Process knowledge suggests the waste would consist of the uranium-contaminated waste from very early 300 Area experimental processes.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-10	Burial Ground	300-FF-2	657 m^2	1950	The site was expected to consist primarily of soil mixed with clean and contaminated metal shavings. The northwest corner terminates very near a dirt road that intersects the midpoint of the west 316-5 Process Trenches. On 11/11/1994, a field walk down resulted in a report that the site appeared as a soil-covered field with natural vegetation.	BHI-01134	Not documented	10/3/1997	Not documented	1.2	As	13.5	/	/	/	/	/
											Thallium	4.1 U	/	/	/	/	/
											Benzo(a)pyrene	0.36 U	/	/	/	/	/
											Chrysene	0.36 U	/	/	/	/	/
											PCBs (total)	0.25 U	/	/	/	/	/
											U (total)	2.69	/	/	/	/	/
											Co-60	0.02 U	/	/	/	/	/
300-11	UPR	300-FF-2	1 × 1 m^2 550 L capacity	1943-1992	The site was releases to the soil that were discovered following the removal of an underground gasoline tank in September 1992. The tank had failed a leak test. The tank was removed; however, the contaminated soil has not been cleaned up. The site is not marked in the field and currently appears as a graveled lot adjacent to the 382 Building.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-15	Process Sewer	300-FF-2	~ 9.7 km (6 mi) outside lines;~40 km (25 mi) interior building waste pipe	1943	This 1943 underground process sewer extends across the 300 Area to dispose process wastes such as potable water, cooling water, precipitation runoff, waste brine solution, chromium, copper, uranium nitrate, sulfate, and fluoride ions with the contaminants lead, silver, acetone, and cyanide. The early system received low-level liquid wastes from the 313 and 314 Buildings, and 3706 and 321 Laboratories. Piping is constructed of stainless steel, wrought iron, and earthenware pipes, all acid proof. By 1994, more than 50 facilities were connected to the process sewer with ~9.6 km (6 mi) of outside, underground piping and an ~ 40.2 km (25 mi) of interior piping. As the system was updated and expanded, pipe materials included the original vitrified clay as well as cast iron, steel, concrete, PVC, and stainless steel.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-16	UPR	300-FF-2	Not documented	Not documented	This WIDS consists of three subsites: 300-16:1, 300-16:2, and 300-16:3. On three occurrences, radioactive contamination (yellow cake uranium) was discovered on the bottom ends of utility poles that had been removed.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-18	Dumping Area	300-FF-2	13× 12 × 1 Overburden Depth: 0.6	Not documented	The site was identified in 1993 as an approximately 4.6 m × 6.1 m (15 × 20 ft) area containing radiologically contaminated soil, metal shavings, nuts and bolts, and concrete. Soil and metal shavings were identified with contamination levels of 3,000 to 4,000 dpm.	CVP-2005-00004	December 2004	May 2005	392	1.0	U (total)	1.38	/	/	0.878	/	/
											As	2.2	/	/	2.20	/	/
											Ba	67.7	/	/	62.1	/	/
											Be	0.65	/	/	0.62	/	/
											Cd	0.4	/	/	0.04	/	/
											Cr	7.40	/	/	6.40	/	/
											Pb	3.60	/	/	3.40	/	/

Table B-1. Summary of 300 Area CERCLA Waste Sites

Site Code	Site Type	OU	Site Dimensions (m) OR m^2	Operation Dates	Site Description	Decision Documents	Remedial Action Start Date	Remedial Action End Date	Waste to ERDF (metric tons)	Maximum Remedial Action Depth (m)	Contaminant of Concern	Max Concentration (pCi/g, mg/kg)			95% UCL (pCi/g, mg/kg)		
												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
300-22	UPR	300-FF-2	6 × 2.5	1962	The site is an UPR from a parted hose coupling that contaminated the ground outside the emergency airlock of the 309 Building on 9/20/1962. The site is covered with new asphalt. The asphalt area is roped off and trucks are not allowed on the asphalt. The rupture loop annex is present below ground.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-24	UPR	300-FF-2	Not documented	Not documented	This site is contaminated soil near the 314 Building. Soil samples of the dirt in the trench near the 314 Building found mostly uranium and a trace of Cs-137. The gross alpha count was 896 pCi/g.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-28	UPR	300-FF-2	168 × 6.5	1994	The site is contaminated asphalt and soil beneath Gingko Street. Patches of new asphalt are visible where utility trenches were excavated. The oxide burner operations caused contamination to spread and be deposited around the 314 Building area. Uranium metal dust from the fuel fabrication activities provided a pathway for heavy metal dust to become airborne and accumulated in the soils throughout the northern portion of the 300 Area.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-29	UPR	300-FF-2	19 × 6	Not documented	The waste is radioactively contaminated soil (reported 5/29/1980). The site is a U-shaped soil berm that surrounds the east wing of the 305-B Chemical Waste Storage Building. On 5/29/1980, the JA Jones subcontractor workers had excavated 76.5 m^3 (100 yd^3) of soil from the 305-B berm before the contaminated rubble was detected and work was stopped. The contaminated material had been taken to the JA Jones Pit No. 1, which was designated as a nonradioactive landfill. Work was stopped immediately after the contamination was identified and the appropriate personnel were notified. Low-level beta/gamma contamination (600 to 4,000 counts/min) was discovered in a small amount of blacktop rubble on the south side of the berm.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-32	Fabrication Shop	300-FF-2	86 × 42	1961	The site is the remaining contaminated components of the former 333 Building, including the concrete pad, any subgrade soils and piping. Chemical wastes included nitric, sulfuric, hydrofluoric, chromic-nitric-sulfuric, and other acids, along with degreasers TCE in the 1960s and early 1970s and PCE and 111-TCA in the 1970s and 1980s. Heat treatment salts included sodium nitrate, sodium and potassium nitrite, and sodium and potassium chloride. Additionally, many alcohol and acetone cleansers were used throughout the building's history.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-33	UPR	300-FF-2	58 × 49	Not documented	The site is the contaminated soil around and under the 306W Building. The area around the 306W Building is paved and posted as having underground radioactive contamination.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-34	UPR	300-FF-2	3.7 (depth)	1995	This release to soil site was discovered during excavation to install a new manhole (PS-87). Soil contaminated with radioactive material was found at ~4 m (12 ft) deep. Maximum soil contamination levels were beta/gamma 10,000 dpm. Soil sample results reported 525 pCi/g total beta and 91 pCi/g total alpha.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-40	UPR	300-FF-2	Not documented	1980	This section of pipe was part of the 300 Area process sewer until it was isolated. This leg of pipe collected rainwater drainage from the 311 Tank Farm and the 303-F Floor Drains. The piping also collected effluent from the 311 Stillhouse. Potential wastes received in this piping system would consist of chemicals used in the 313 Building fuels manufacturing process. These include nitric acid, sodium hydroxide, alcohol, TCE, phosphoric acid, Duponol-M-3, hydrofluorosilicic acid, thorium, uranium, and cutting oils.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-41	Neutralization Tank	300-FF-2	2 (dia.)	Not documented	The site includes a neutralization tank and valve pit. The valve pit is constructed of concrete and is covered by a 2.18 m (7.15 ft) diameter metal lid. The neutralization tank and valve pit	EPA, 2001; RSVP-2010-058	Jul-09	Nov-09	30,513	1.5	U233-234	1.92	/	/	1.94	/	/
											U-238	1.07	/	/	1.85	/	/

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
					intercepted and neutralized nitric acid-bearing chemical wastes before discharge to the process sewer. The lime pit is said to contain uranium and thorium sludge.						As	3.24	/	/	2.63	/	/
											Ba	64.6	/	/	73.0	/	/
											Be	0.169	/	/	0.249	/	/
											Bo	1.03	/	/	1.51	/	/
											Cd	0.100	/	/	0.0864	/	/
											Co	5.64	/	/	6.25	/	/
											Cr	8.08	/	/	8.80	/	/
											Cu	10.4	/	/	13.3	/	/
											Hg	0.0158	/	/	/	/	/
											Pb	3.16	/	/	4.19	/	/
											Li	6.58	/	/	5.42	/	/
											Mn	259	/	/	313	/	/
											Mo	0.275	/	/	0.462	/	/
											Ni	8.04	/	/	8.87	/	/
											Ag	0.782	/	/	/	/	/
											U (total)	7.26	/	/	/	/	/
											V	51.4	/	/	52.4	/	/
											Zn	38.9	/	/	41.6	/	/
											Aroclor 1016	0.0103	/	/	/	/	/
											Aroclor 1248	0.330	/	/	/	/	/
											Aroclor 1254	0.385	/	/	0.177	/	/
											Aroclor 1260	0.052	/	/	0.0169	/	/
											Butylbenzyl-phthalate	0.228	/	/	/	/	/
											Methylene chloride	0.00221	/	/	0.00298	/	/
											Chloride	15.2	/	/	/	/	/
											Fluoride	1.3	/	/	1.6	/	/
											Nitrogen	4.0	/	/	/	/	/
											Sulfate	15.8	/	/	/	/	
300-43	UPR	300-FF-2	Not documented	1972-1989	The waste is uranium-contaminated soil remaining following operations of the 304 CF and 304 SA facilities. Sampling and analysis during TSD closure activities for the 304 CF and 304 SA showed uranium contamination at levels up to 256 µg/g for shallow soils at the exterior storage pad.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-44	UPR	300-FF-1	159.0 m^2	Not documented	This contaminated area was identified during the 300-FF-1 OU Phase 1 Ris conducted in 1989 and 1990 (DOE/RL-92-43). An attempt was made to remove the contamination, but it was concluded that the area appeared to be shallow buried material. The soil contamination appears to be the result of shallow buried materials.	BHI-01135	Not documented	11/18/ 1997	Not documented	1.2	As	16.9	9.1	/	/	/	/
											Thallium	3.2 U	3.4 U	/	/	/	/
											Benzo(a) pyrene	0.33 U	0.35 U	/	/	/	/
											Chrysene	0.33 U	0.35 U	/	/	/	/

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
											PCBs (total)	0.23 U	0.23 U	/	/	/	/
											U (total)	0.61	0.69	/	/	/	/
											Co-60	0.051 U	0.19 U	/	/	/	/
300-45	UPR	300-FF-2	1874.23 m^2	Not documented	It has been determined the area consisted of contaminated soil caused by the spread of radioactive rabbit feces.	BHI-01136	Not documented	10/3/ 1997	Not documented	0.3	As	6.1 U	/	/	/	/	/
											Thallium	3.5 U	/	/	/	/	/
											Benzo(a) pyrene	0.36 U	/	/	/	/	/
											Chrysene	0.36 U	/	/	/	/	/
											PCBs (total)	0.23 U	/	/	/	/	/
											U (total)	2.47	/	/	/	/	/
											Co-60	0.051 U	/	/	/	/	/
300-46	UPR	300-FF-2	Not documented	Not documented	Contamination of the area surrounding the 3706 Building resulted primarily from the operations and associated spills and releases. Although radiological surveys near and around the 3706 Building have not detected any radiologically contaminated soil, subsurface contamination is suspected.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-48	UPR	300-FF-2	14.68 × 8.69	1949-1970	The handling of thorium powder targets spread fine and particulate contamination throughout the 3732 Building. Decontamination practices included hosing down the facility floors and walls, allowing contaminated liquid to be released to the surrounding soil.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-49	Dumping Area	300-FF-1	105 × 75	Not documented	Subsidence and surface debris were visible in this large, such as acid and mercury bottles, ceramics, and other laboratory glassware, metal, and a partially buried 208 L (55 gal) drum. Radiologically contaminated materials included soil, tumbleweeds, pipes, ceramics, glass, and a small amount of yellow material that resembles “yellow cake”. May have been used for random disposal of miscellaneous waste from 300 Area laboratory operations.	CVP-2000-00020	December 1999	6/28/ 2000	17,761	3	Co-60	0.027 U	0.026 U	/	0.011	0.011	/
											U-233/234	1.7	1.1	/	1.24	0.99	/
											U-235	0.24 J	0.057 J	/	0.14	0.083	/
											U-238	1.3	1.1	/	1.0	1.0	/
											Aroclor 1254	0.035 U	3.0	/	0.035	1.3	/
											Pb	8.90	41	/	6.3	21.0	/
300-50	Dumping Area	300-FF-1	Not documented	Not documented	The site was an area of surface disturbance. Many discrete objects were detected by GPR. The Landfill 1 B site was identified as an undocumented landfill in 1990 during the 300-FF-1 OU RI (DOE/RL-92-43). The original purpose of the landfill and its period of operation are unknown.	CVP-2000-00021	December 1999	8/12/ 2000	35,652	3.1	Co-60	0.062 U	0.059 U	/	0.025	0.027	/
											U-233/234	15.5	8.0	/	7.4	5.7	/
											U-235	0.89 J	0.54 J	/	0.61	0.43	/
											U-238	16.6	7.7	/	7.9	5.7	/
											Aroclor 1254	0.180	0.026 J	/	0.12	0.035	/
											Aroclor 1260	0.04 U	0.230	/	0.04	0.15	/
300-51	Dumping Area	300-FF-1	23 × 15	Not documented	The site contained radiologically contaminated surface debris. This area of surface contamination and debris was identified in 1990 during the 300-FF-1 OU (UPR-300-FF-1) RI (DOE/RL-92-43). Geophysical surveys of the area did not detect any significant anomalies.	EPA/ROD/ R10-96/143	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
300-52	Trench	300-FF-1	182.88 × 19.81	1948-1996	The 300 Area Sanitary Trenches Site includes two septic tanks and unlined trenches that were connected to the 300 Area SSS. The trenches received sanitary waste from 300 Area facilities.	EPA/ROD/ R10-96/143	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-53	UPR	300-FF-2	0.91 × 0.30	1996	The site was contaminated soil that was discovered on the surface of some slightly eroded soil located within a posted URMA. The actual erosion was at the end of a concrete splashguard underneath the water discharge pipe. Disruption of the ground surface by the fire suppression system testing exposed sub-surface contamination that had been previously covered with clean soil.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-80	French Drain	300-FF-2	1.22 × 1.22	Not documented	The site is a square concrete structure adjacent to the 314 Building and next to a fenced stairway leading down. The site is covered by a steel plate marked with a sign “Radioactive material, internally contaminated.” The purpose of this structure in not clear. The site appears to have become contaminated.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-109	Injection/ Reverse Well	300-FF-2	Not documented	Not documented	DOE/RL-95-82 states the injection well is below grade and drains a network of four catch basins.	EPA, 2001; CVP-2010-00004; WSRF 2010-010	April 2009	April 2009	570	3.7	Cs-137	0.070	/	/	0.027	/	/
											U-233/234	2.68	/	/	1.73	/	/
											U-235	0.243	/	/	0.142	/	/
											U-238	2.47	/	/	1.68	/	/
											Tc-99	0.204 U	/	/	/	/	/
											Th-232	0.765	/	/	/	/	/
											As	3.40	/	/	2.88	/	/
											Ba	96.1	/	/	82.6	/	/
											Be	0.254	/	/	0.224	/	/
											B	3.10	/	/	1.65	/	/
											Cd	0.118	/	/	0.0900	/	/
											Cr (total)	11.1	/	/	9.98	/	/
											Co	7.29	/	/	6.33	/	/
											Cu	18.2	/	/	13.0	/	/
											Pb	12.6	/	/	7.19	/	/
											Mn	353	/	/	311	/	/
											Mo	0.560	/	/	0.460	/	/
											Ni	9.80	/	/	9.23	/	/
											V	65.2	/	/	53.8	/	/
											Zn	65.5	/	/	47.2	/	/
											Acenaphthene	0.0248	/	/	/	/	/
											Benzo(a)anthracene	0.00680	/	/	0.00435	/	/
											Benzo(a)pyrene	0.00627	/	/	0.00306	/	/
											Benzo(b) fluoranthene	0.0143	/	/	0.00590	/	/
											Benzo(ghi)perylene	0.00698	/	/	/	/	/
											Benzo(k) fluoranthene	0.00519	/	/	0.00261	/	/

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
											Chrysene	0.0106	/	/	0.00543	/	/
											Dibenz(a,h) anthracene	0.00125	/	/	/	/	/
											Fluoranthene	0.0133	/	/	0.00887	/	/
											Fluorene	0.00215	/	/	/	/	/
											Indeno(1,2,3-cd)pyrene	0.0895	/	/	0.00713	/	/
											Naphthalene	0.110	/	/	0.0309	/	/
											Phenanthrene	0.00818	/	/	0.00467	/	/
											Pyrene	0.00759	/	/	/	/	/
											Aroclor 1254	0.780	/	/	0.191	/	/
											Aroclor 1260	0.153	/	/	0.0851	/	/
300-110	Injection/ Reverse Well	300-FF-2	0.4 (dia.)	Not documented	The site is a 0.41 m (1.3 ft) dia. Drain with a metal grate labeled "Internal Radioactive Contamination "due to its closeness to 618-1. The drain has a dirt bottom that is approximately 0.61 m (2 ft) below the asphalt surface and an overflow line that drains to the process sewer.	EPA, 2001; CVP-2010-00001; WSRF 2010-024	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1
300-121	French Drain	300-FF-2	1.37 (dia.)	Not documented	The site received condensate from the air receivers inside the 3621D Building. It may also have received any spills that reached the floor drains. There is a potential for contamination from petroleum and ethylene glycol.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-123	French Drain	300-FF-2	0.69 (dia.)	Not documented	This French drain received steam condensate from the 366 Building fuel oil bunker loading station. The French drain is a metal culvert that is covered with a 0.69 m (2.25 ft) dia. Diamond plate metal cover.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-175	French Drain	300-FF-2	0.36 (dia.)	1995	The site is a concrete French drain with a metal cover. The waste was non-dangerous/ nonradioactive steam condensate only. The flow rate when the site was active was less than 0.038 L/min (0.01 gal/min).	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-214	Radioactive Process Sewer	300-FF-2	274.32 (length)	1953	The site is an underground carbon steel and PVC pipeline connecting the 300 Area laboratory facilities (308, 324, 325, 326, 327, and 329 Buildings) to the 307 Retention Basins. The waste discharged to the RPS is nonhazardous, potentially radioactive waste (not to exceed 5,000 pCi/L) from the 300 Area Laboratory facilities. In FY 1998, approximately 12 million L (3 million gal) flowed through the RPS to the 307 Retention Basins.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-218	Fabrication Shop	300-FF-2	60.96 × 27.43 × 12.19	1943-1996	The site is the 314 and 314A Buildings. This site has been demolished down to the slab. This building is one of the original World War II-era 300 Area, Manhattan Engineering District/ DuPont structures. Exterior walls and partitions are concrete block. The floor is reinforced-concrete with test pits and a basement room at the west end. A small second floor or mezzanine exists at the west end of the building.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
300-219	Process Sewer	300-FF-2	Not documented	Not documented	This site includes the transfer lines connecting the various components of the 300 Area WATS and the 300 Area URO. The piping, located in the Pipe Trench (300-224), includes: (1) the 333 N Fuels process transfer lines to the process acid waste solution storage tanks in the 333 and 334-A Facilities, (2) the waste transfer lines to the waste treatment facilities in the 313 Uranium Recovery/WATS Neutralization Room, (3) the transfer lines to/from the 313 Building to the neutralized acid waste storage tanks in the 311 Tank Farm, (4) ethylene glycol supply and return lines in the Pipe Trench between the 333 Building and the 313 Building used to heat this portion of the Pipe Trench, (5) fresh acid (nitric and sulfuric) lines from the 334 Tank Farm to the 333 Building, and (6) caustic lines from the Tank Farm to the 313 WATS/URO Room. As of 11/1/1998, all process and waste piping inside the associated facilities had been disconnected from the Pipe Trench; only the piping inside the Pipe Trench or outside the facilities (e.g., tank farm piping) remains for pipes associated with the 300 Area WATS or the 300 Area U-Bearing Acid Treatment System.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-224	Trench	300-FF-2	243.84 (length)	1960-1988	The site is a subsurface, concrete pipe trench with concrete block and metal plate covers. The pipe trench has several sections that allow piping connections to be made between process operations in the 313 Building, the 303-F Building, the 311 Tank Farm, the 333 Building, the 334-A Building, and the 334 Tank Farm. The pipe trench and subsurface soil have become contaminated due to multiple releases into the trench. Releases included acids, bases, and solvents. Some of released acids contained dissolved uranium.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-249	Process Unit/Plant	300-FF-2	Not documented	1952-1995	This site is the residual radioactive contamination at the 304 Building that was not closed out as part of the 304 Concretion Facility. Residual uranium contamination remains in the building from its past use as a concretion facility.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-251	UPR	300-FF-2	Not documented	1943	The site consists of uranium-contaminated soil around and under the 303-K Building (also known as the 303-K CWS). The 303-K Building was removed and clean closed on 7/22/2002.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-253	Sump	300-FF-2	4.51 × 2.65	1977-1998	The site was a two-chambered concrete structure. The larger chamber was the salt dissolving pit, also identified as the "Salt Storage Pit." This section held the salt that was dissolved to make the brine. The smaller chamber was the brine pump pit, also identified as "brine." This chamber held the filtered brine for use in powerhouse operations. The steam system used "soft" water. Brine was used to regenerate the ion exchange demineralizers in the water softeners.	Not documented	Not documented	N/A									
300-255	UPR	300-FF-2	23.64 × 21.70	1960-1969	The site is contaminated soil located inside the 309 Building Tank Farm fenced area. The source of the contamination was probably the piping related to tanks 309-TW-1, 309-TW-2 and 309-TW-3. Potential radioactive COCs are Cs-137, Co-60, and Am-241. Potential hazardous contaminants are barium, cadmium, chromium, lead, and selenium. The related contaminated structures, e.g., tanks, valve pit, and ancillary piping will need to be removed under a D&D action before soil remediation.	EPA, 2001	N/A										
300-256	UPR	300-FF-2	57.91 × 48.77	1956	The site is contaminated soil under and around the 306E Building. The area around the 306E Building is paved and posted as having underground radioactive contamination.	EPA, 2001; RSVP-2010-058	Jul-09	Nov-09	30,513	1.5	Same as for 300-41	Same as for 300-41	Same as for 300-41	Same as for 300-41	Same as for 300-41	Same as for 300-41	Same as for 300-41

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
300-257	Process Sewer	300-FF-2	0.91 (dia.)	Unknown – late 1970s	The waste is a pipeline that carried potentially radioactively contaminated water to the river. The site is process sewer piping that was originally connected to the 309 Building's Rupture Loop Holding Tank. The tank was removed in the late 1970s. At the same time the Rupture Loop Holding Tank was removed to a 200 Area burial ground, all RLWS connections were severed and plugged. The area where the Rupture Loop Holding Tank was located is now covered with asphalt and is being used as a parking lot.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-258	Trench	300-FF-2	73 (length)	1960-1975	The site is an abandoned subsurface concrete pipe trench. The pipe trench was used to house acid transfer piping from the 334 Tank Farm to the 306E Building chemical processing bay in the northeast corner of this facility. From about 1972 to1975, waste etch solution may have been transferred from the 306E Building chemical bay to the 333/334 WATS.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-259	UPR	300-FF-2	103 × 53	Not documented	In March 1991, partially buried debris was observed protruding from the ground north of the 618-1 Burial Ground marker posts. Removed leather gloves emitted 30,000 dpm beta/gamma and 2,000 dpm alpha radiation. Additional soil contamination east of the 618-1 Burial Ground Markers emitted 20,000 dpm beta/gamma and 1,400 dpm alpha radiation. The debris and some soil were removed and placed into a radioactive waste box.	EPA, 2001; WSRF 2009-059	3/18/2009	5/18/2009	6,600	1	U-233/234	3.01	/	/	1.51	/	/
											U-238	2.10	/	/	1.30	/	/
											Sb	0.353	/	/	0.315	/	/
											As	2.33	/	/	2.07	/	/
											Ba	82.6	/	/	74.3	/	/
											Be	0.241	/	/	0.224	/	/
											B	2.24	/	/	1.27	/	/
											Cd	0.495	/	/	0.152	/	/
											Cr (total)	9.32	/	/	7.90	/	/
											Co	6.02	/	/	5.81	/	/
											Cu	11.9	/	/	10.7	/	/
											Pb	6.99	/	/	4.58	/	/
											Mn	338	/	/	319	/	/
											Hg	0.01	/	/	/	/	/
											Mo	0.379	/	/	0.301	/	/
											Ni	11.7	/	/	8.63	/	/
											V	46.6	/	/	42.7	/	/
											Zn	1,030	/	/	255	/	/
300-260	UPR	300-FF-2	35 × 30	Not documented	The contamination discovery date is Not documented. Pb and Ba were detected in soil, and were used in fuel fabrication processes. Their levels exceeded regulatory standards in soil. Process slag may have been staged here at pre-asphalt surface conditions, before transport to a burial ground.	EPA, 2001; WSRF 2010-074	June 2010	June 2010	1,278	1	U-235	0.251	/	/	/	/	/
											U-238	4.3	/	/	/	/	/
											Sb	0.922	/	/	/	/	/
											As	3.16	/	/	/	/	/
											Ba	122	/	/	/	/	/
											Be	0.239	/	/	/	/	/
											B	8.36	/	/	/	/	/
											Cd	0.11	/	/	/	/	/
											Cr (total)	9.89	/	/	/	/	/
											Co	7.43	/	/	/	/	/
											Cu	73.3	/	/	/	/	/
											Pb	18.3	/	/	/	/	/
											Mn	328	/	/	/	/	/

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
											Hg	0.012	/	/	/	/	/
											Mo	0.537	/	/	/	/	/
											Ni	10.2	/	/	/	/	/
											Ag	0.206	/	/	/	/	/
											V	59	/	/	/	/	/
											Zn	77.4	/	/	/	/	/
300-262	UPR	300-FF-2	Not documented	1943-1975	The waste is radioactively contaminated soil. The contamination is suspected to be scrapings from the 316-1, SPP. The survey report indicates readings up to 15,000 dpm beta/gamma. Potential COCs may be the same as those for 316-1, including U-238 and Co-60. Other contaminants may be copper, chromium, ammonia, and PCBs.	CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002
300-263	Catch Tank	300-FF-2	77070.99 (capacity)	1969	The site is an inactive catch tank. Hazardous or radioactive waste was never transferred from the 324 Building to the tank. The tank is isolated and the pipelines are capped. Sample results indicated Cs-137 to be 509 pCi/L. Gross beta was 1,700 pCi/L. At the time the site was sampled, 15.2 cm (6 in.) of rainwater. The water may have come from intrusion because many of the flange bolts were missing. Surface contamination is suspected. This site lies in the middle of WIDS Site 316-3, 307 Disposal Trenches.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-265	Radioactive Process Sewer	300-FF-2	Length: 213.36	1971	The transfer line carried liquid High Level Waste from spent nuclear fuel processing.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-268	Foundation	300-FF-2	9.14 × 4.27	1944-1956	The contamination related to this building were a result of passive dust from machining irradiated uranium, graphite, and other metallic samples from the 305 Test Pile. The contamination, if remaining, would be associated with any remaining concrete foundation.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-269	Foundation	300-FF-2	31.40 × 14.50	1972-1995	The site is a rectangular concrete building foundation. The 331-A Building was used for biological research and demolished in 2000. Residual contamination may be on the pad from past releases at the building.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-270	UPR	300-FF-2	Not documented	2000	The UPR is a milky-white flow of water that came out of a pipe located below the loading dock on the east side of the 313 Building. The dock is used by Richland Specialty Extrusions to store metal cylinders. The pipe drains stormwater from the roof of the 313 Building. The release was on to the surface of the ground, in an area of compacted gravel and soil. The stormwater is non-dangerous and nonradioactive. Soil collected from the area near the pipe showed elevated levels of lead. The contaminated soil was not caused by the milky-white liquid. The source of the lead contamination is unknown.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-273	Product Piping	300-FF-2	Length: 53 Dia. (Large): 0.12	1964-1998	The site is an encased underground pipeline. The encased pipeline contains two 7.6 cm (3 in.-) dia. Stainless steel lines. The underground pipeline transferred fuel oil from the 366 Fuel Oil Bunkers (300-6) to the underground Fuel Oil Day Tanks (300-223) to run the 384 Powerhouse.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-274	Dumping Area	300-FF-2	Not documented	Not documented	Transite pipe, treated wood, insulation, and various forms of transite were identified during the OU walk down. The debris was determined to be potential asbestos containing material.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-275	Sanitary Landfill	300-FF-2	337 m^2	Not documented	The site is comprised of four zones of sparsely scattered subsurface debris, including small fragments of potential asbestos-containing shingles and concrete. Buried debris is not identified. The operating history and COPC list is similar to that of 300-49.	EPA, 2001; EPA et al., 2009; WSRF 2008-059	July 2007	August 2007	2,754	3	Cs-137	0.082	/	/	0.030	/	/
											Co-60	0.035 U	/	/	/	/	/
											U-233/234	16.2	/	/	4.22	/	/

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
											U-235	1.00	/	/	0.293	/	/
											U-238	15.5	/	/	4.05	/	/
											Sb	0.26	/	/	/	/	/
											As	2.9	/	/	2.77	/	/
											Ba	108	/	/	74.0	/	/
											Be	0.65	/	/	0.45	/	/
											B	3.4	/	/	1.4	/	/
											Cd	0.21	/	/	0.10	/	/
											Cr (total)	10.3	/	/	9.0	/	/
											Co	7.6	/	/	6.0	/	/
											Cu	84.2	/	/	26.0	/	/
											Pb	17.4	/	/	6.8	/	/
											Li	9.1	/	/	7.1	/	/
											Mn	307	/	/	293	/	/
											Hg	0.04	/	/	0.03	/	/
											Mo	0.67	/	/	0.4	/	/
											Ni	13.5	/	/	9.5	/	/
											Ag	0.20	/	/	/	/	/
											Sr	36.6	/	/	27.5	/	/
											Th	0.55	/	/	/	/	/
											Sn	3.0	/	/	2.0	/	/
											U	2.5	/	/	/	/	/
											V	53.1	/	/	51.7	/	/
											Zn	53.2	/	/	41.4	/	/
											Acenaphthene	0.96	/	/	/	/	/
											Benzo(a)pyrene	0.0013	/	/	/	/	/
											Benzo(b) fluoranthene	0.0046	/	/	/	/	/
											Benzo(ghi)perylene	0.0014	/	/	/	/	/
											Chrysene	0.0022	/	/	/	/	/
											Fluoranthene	2.3	/	/	/	/	/
											Fluorene	0.13	/	/	0.018	/	/
											Phenanthrene	0.026	/	/	0.0050	/	/

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
300-276	Sanitary Sewer	300-FF-2	Not documented	1943-1996	The original 300 Area SSS serviced all existing 300 Area Buildings and a process line from the 313 Building with vitrified clay sanitary sewer pipes. The system fed into a large septic tank with a connection to a tile drainage field. The site includes the surface and subsurface sewer system. In 1947, capacity was increased by adding a new tile field, overflow ditch, and connecting ditch. It was at this time that uranium contamination was discovered in the sanitary sewer sludge and water. The system was expanded again in 1951 to cope with the increasing number of 300 Area facilities by adding two more septic tanks and north and south leaching trenches to replace the old tile field. The system continued to be used until 1996 when the 300 Area SSS was tied into Richland's municipal water treatment system. The SSS potentially contains radioactive and chemical contaminants.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-277	UPR	300-FF-2	Not documented	Not documented	Contamination was discovered at the East Container Transfer Area (300 Area Queue) on August 25, 2004, during grading operations (M-082704-6). Black ash, small pieces of transite, broken glass, and metals were visible in soil. Beta/gamma levels were 4,000 cps. In January 2006, additional contamination was discovered while installing outdoor lighting.	N/A	N/A	N/A	270	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-279	Storage Tank	300-FF-2	Not documented	1943-1947	This feature consists of the historical location of underground diesel and gasoline storage tanks that were located to the north of the original 313 Bldg. (M-2885 sheet 1 rev 0), and east of the original 3716 Automotive Repair Building. The northern expansion of the 313 Building was over this area where the tanks were located.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-280	Dumping Area	300-FF-2	13 × 38	1950s	The rectangular, construction debris, disposal pit was aligned northwest to southeast with a 6 m (20 ft) wide gravel road ramping into the northwest end of the.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-281	Septic Tank	300-FF-2	Not documented	Not documented	This is the suspected site of a septic tank that was shown on drawing H-3-45154. The drawing calls for removal of the septic tank. However, the entire drawing was placed on hold for future construction and it is unclear if the septic tank was ever removed. The drawing was for a facility that was never built.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-283	Trench	300-FF-2	28 × 26	1965	Located 155 m (508 ft) southeast of the 309 Building, 157 m (515 ft) south of the 324 Building and 47 m (154 ft) north of Cypress Street.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-284	UPR	300-FF-2	Not documented	Not documented	The waste site is an intentional release to soil. This feature is the historical location of the sand blasting area associated with the former 3221 building location. The site and associated 3221 building was used for the sand blasting of various items preparatory to these items being painted. The area currently is used as a parking area for 300 Area D4 activities.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-286	French Drain	300-FF-2	Not documented	Not documented	This site consists of three, discrete locations of potentially contaminated soil beneath a French drain and drywells, and their associated subsurface piping components. These features collected liquids from sumps, a stormwater catch basin, an evaporative cooler, and a guardhouse drinking fountain. Contamination may be from the 309 Building exhaust stack and filter pit.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-287	Dumping Area	300-FF-2	0.5 × 1.5	Not documented	The waste site consists of broken corrugated transite in a pile, approximately 28 m west of Route 4S.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-288	Dumping Area	300-FF-2	5 (dia.)	Not documented	This feature consists of two piles of garnet blasting material, totaling ~15 m^3 (20 yd^3), and each pile is ~5% garnet sand and 95% soil. While garnet is not hazardous, contamination from the blasted material may be present.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
300-289	UPR	300-F-2	Not documented	Not documented	This feature consists of bare ground, with crusting and two drum bung plugs.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-290	Dumping Area	300-FF-2	Not documented	Not documented	The site is posted Radiological Materials Area, ~ 64 m^2. The material consisted mostly of rusted metal automotive parts, scraps of crumpled sheet metal, electrical wire debris, and engine gaskets, consistent with debris received by the Horn Rapids Landfill, which operated as an uncontrolled landfill from the late 1940s to the 1970s.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-291	Dumping Area	300-FF-2	Not documented	Not documented	This waste site consists of garnet sand on a rocky road bed approximately 60 m west or the 350A paint shop.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-293	Piping	300-FF-2	Not documented	Not documented	The site consists of miscellaneous piping in the 300 Area. The 300 Area Orphan Site Evaluation identified 278 unidentified underground utility lines (UGL) having a total length of 2,755 m (1.71 mi) (Other08252010). Most of the lines have unknown terminal ends (starting and ending points of origin), which suggests that the estimated length is substantially underestimated. The unidentified underground lines may include many non-hazardous telecommunication, compressed gas and electrical related utilities. The site was divided into two subsites: 300-293:1, <2.5 ft bgs; and 300-293:2 ≥2.5 ft bgs. No process history is associated with 300-293.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-294	Dumping Area	300-FF-2	Not documented	Not documented	This feature consists of garnet sand on a gravel road bed.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
300-296	UPR	300-FF-2	8 × 7	1986	The site consists of contaminated soil beneath the B-Cell of the 324 Building. The lateral and vertical extent of contamination is not fully known at this time. The B-Cell was 9.3 m (30 ft) high. The floor and walls (up to 8.2 m [27 ft] high) were lined with stainless steel (H-3-20195, H-3-20213, H-3-20214 and H-3-20273). The floor sloped to a trench that ran the length of the east side of the cell. The trench emptied into a sump located in the northeast corner of B-Cell (H-3-20195).	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
303-M SA	Storage	300-FF-2	14 × 11	1983-1987	The 303-M Storage Area is an inactive curbed 15 cm (6 in.) concrete pad adjacent to the west side of the 303-M Uranium Oxide Facility. The area was used for storage of pyrophoric uranium and zirconium fines awaiting treatment in the 303-M Oxidation Facility. The metal turnings were stored underwater in 114 L (30 gal) metal drums. The drums of uranium fines were stored in a spaced array defined by painted yellow circles on the pad. Approximately 115,300 kg (127 tons) of uranium were treated during the 303-M Facilities operation.	EPA, 2001; CVP-2010-00001; WSRF 2010-025	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1
303-M UOF	Process Unit/Plant	300-FF-2	Not documented	1983	The oxidation process feed material was pyrophoric uranium and 16ircaloy-2 fines. Approximately 115,300 kg (127 tons) of material was oxidized during operations. Waste currently at the facility may include residual radiological and chemical contamination in the process equipment, on surfaces, and in the process sewer.	EPA, 2001; CVP-2010-00001; WSRF 2010-026	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1
											Cd	1.3	/	/	/	/	/
											Cr	19.8	/	/	/	/	/
											Pb	863	/	/	/	/	/
											Ni	89.5	/	/	/	/	/
											Ur	256	/	/	/	/	/
											TCE	0.0067 U	/	/	/	/	/

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
											PCE	0.0067 U	/	/	/	/	/
											1,1,1 TCA	0.0067 U	/	/	/	/	/
											1,1 DCE	0.0067 U	/	/	/	/	/
											cis- 1,2 DCE	0.0067 U	/	/	/	/	/
											trans-1,2 DCE	0.0067 U	/	/	/	/	/
											MEK	0.014 U	/	/	/	/	/
311 MT1	Storage Tank	300-FF-2	7.32 (length) 1.63 (dia.) 15,142 L (capacity)	1955-1971	The site consisted of a horizontal, flat-ended cylindrical tank. While in service, the unit stored pure methanol used as a final rinse to remove water from aluminum end caps and cans in the "triple dip "and "lead dip" fuel fabrication processes. The tank was in use until 1971, when the tank was pumped out and filled with water. The tank was emptied in 1987 and removed on 11/30/1989.	Not documented	8/30/1989	8/30/1989	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
311 MT2	Storage Tank	300-FF-2	7.41 (length) 1.83 (dia.) 22712 L (capacity)	1955-1971	The site consisted of a horizontal, flat-ended cylindrical tank. While in service, the unit stored used methanol solution generated in the 313 fuel fabrication/final rinse processes, until the solution was de-watered in the still. The dewatered methanol was then added to the 311 Methanol Tank (WIDS Site 311 MT1). The tank was in use until 1971, when the tank was pumped out and filled with water. The tank was emptied in 1987 and removed on 8/30/1989.	Not documented	8/30/1989	8/30/1989	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
313 ESSP	Storage	300-FF-2	Not documented	Not documented	The 313 East Side Storage Pad is a large concrete pad with an asphalt ramp that connects the pad to Gingko Street. The area was used to stage mixed waste including byproduct waste materials from the fuels fabrication process and neutralized solids from the 313 Recovery Operations process.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
313 MT	Storage Tank	300-FF-2	Not documented	1955-1971	The site consisted of a steel cylindrical tank lying horizontally. The tank was below the floor of the 313 Building. From 1971 to 1987, the tank contained an aqueous methanol solution. In case of a fire in the 313 Building, the methanol from the dehydration tanks could be released to the underground tank. The tank was never used for an emergency dump. The tank was filled with water in 1971, and emptied in 1987. 2,271 L (600 gal) of water and 0.7% methanol was removed from the tank. The excavation was backfilled and the floor was patched with concrete.	Not documented	8/30/1989	8/30/1989	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
316-1	Pond	300-FF-1	32,000 m^2	1943-1975	The original unlined percolation pond had a surface area of 45,522 m^2 (490,000 ft^2), was 1.5 m (5 ft) deep, and was separated into five separate sections. The site originally received cooling water and low-level liquid wastes from the fuel fabrication facilities and early laboratories (313, 314, 3706, and 321 Buildings). Contaminants from these facilities included uranium, copper, cobalt, and small amounts of plutonium. Combined process wastes discharged from the fuel fabrication	CVP-2003-00002	1997	2000	234,000	5.7	Co-60	0.12	7.2	0.0133 U	0.047	2.03	0.00605
											U-234	30.1	242	40.8	13.7	21.2	18.3
											U-235	2.15	11.9	1.87	0.991	2.11	0.801
											U-238	28.9	216	40.6	13.8	19.6	18.5
											Aroclor 1248	0.034 U	0.072 U	3	0.034	0.038	3

Table B-1. Summary of 300 Area CERCLA Waste Sites

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
					facilities to the South and North Process Ponds ranged from 1,514,000-11,360,000 L/day (400,000-3,000,000 gal/day). In August 1945, the pond overflowed on the east side (toward the Columbia River). A crushed rock and earth dike was built in September 1945. This overflow gave the first indication that the infiltration rate was affected by the accumulation of aluminum/uranium hydroxide precipitate. In October 1948, the SPP dike broke on the northwest side, releasing the bulk of the pond's contents, including 5.4 to 27.7 kg (12 to 61 lb) or uranium, into the Columbia River. The breach was attributed to the accumulation of aluminum/uranium hydroxide precipitate on the pond bottom. The North Process Pond was built as a substitute for the SPP while repairs were made and the bottom was cleared of precipitate. Following the incident, the ponds were regularly dredged to prevent future dike failures. The sediments from dredging were deposited on the surrounding dikes and on the scrapings disposal area. The site was Closed Out under EPA/ROD/R10-96/143. Approximately 234,000 metric tons (257,000 tons) of material were removed from the site. The excavation depth was about 5.7 m (19 ft).						Aroclor 1254	0.062	0.188	0.035 U	0.062	0.091	0.035
316-2	Pond	300-FF-1	Not documented	1948-1974	This site was divided into seven sections separated by 3.7 m (12 ft) wide dikes, with the entire 40,000 m2 (10 ac) area surrounded by a dike 4.6 m (15 ft) wide and approximately 3.0 m (10 ft) high. It was built and began receiving waste in 1948 after a dike failure at the SPP. The site originally received cooling water and low-level liquid process wastes from the fuel fabrication facilities and the early laboratories (313, 314, 3706, and 321 Buildings). In 1955, the North Process Pond was taken out of service for 14 months to deal with the uranium-bearing sludge on the bottom of the pond. Dredging recovered 4,672 kg (10,300 lb) of uranium from deposits up to 22.9 cm (9 in.) thick in two locations in the southwest region of the pond. It is estimated that before 1954, 21,955 L (5,800 gal) per month of sodium aluminate containing 22.7 kg (50 lb) of uranium, was released into the South and North Process Ponds, resulting in a total accumulation of 2,722 kg (6,000 lb) of uranium. Additionally, an estimated 8,684 kg (19,145 lb) of mostly depleted U-235 was discharged to the Ponds from the 321 Building. Remediation began in May 1998 and was completed in June 1999. Almost 140,000 metric tons (154,324 tons) of contaminated soil was transferred to.	EPA/ROD/R10-96/143; BHI-01298	May 1998	January 1999	139,204	2.1	PCBs (total)	0.28 U	2.12 J	0.29 U	N/A	1.87	N/A
											U (total)	/	/	/	96.22	221.6	49.7
											U-234	95	147	36.5	/	/	/
											U-235	12.2	15.2	1.39	/	/	/
											U-238	79	119	36.8	/	/	/
											Co-60	0.1	0.75	0.02 U	0.09	0.46	N/A
316-3	Trench	300-FF-2	182.88 × 3.05 × 6.10	1953-1963	The site received wastes from the 300 Area Laboratory expansion facilities (329 Biophysics Laboratory, 327 Radiometallurgy Building, 324 Radiochemistry Building, 326 Pile Technology Building, and 329 Mechanical Development Building). The wastes first went through the 307 Retention Basin. Retention Basin waste below discharge limits was released to the trenches.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
316-4	Crib	300-FF-2	7.92 × 7.92 × 5.49	1948-1956	The site received hexone-bearing uranium wastes and limited amounts of other uranium-bearing wastes from the 321 Building. Calculations up to and including July 1955 indicated liquid wastes containing a total of 550 kg (1,230 lb) of uranium had been discharged to this site. Additional documentation has been found indicating 12,040 L (3,182 gal) of liquid organic waste was being shipped to the 300 North Cribs in 1962.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table B-1. Summary of 300 Area CERCLA Waste Sites

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
316-5	Trench	300-FF-1	470 × 3 × 3.7	1975-1994	This unit served as the discharge site for the 300 Area Process Sewer System. The 468 m (1,535 ft) long, 3 m (10 ft) wide, 3.7 m (12 ft) deep ponds, spaced 15 m (50 ft) apart were constructed to receive the low-level waste that had previously gone to the South and North Process Ponds (316-1 and 316-2). The two trenches operated alternately with one being filled to a predetermined level before switching to the other one, usually every 2 to 6 months. The site received approximately 9.8 million (2.6 million gal) of water per day. This water was chlorinated by the water filter plant for the 300 Area and contained minerals added to the water during use. Water discharged to the process sewer was used primarily for cooling purposes and was not modified. Other sources of discharge include steam condensates, janitorial solutions from washing and waxing floors, water treatment (primarily salt), laboratories, process water from fuel fabrication and other aqueous solutions not designated as dangerous wastes by WAC 173-303. In 1991, an Expedited Response Action resulted in the removal of contaminated soil and sludge from the sides and bottom of the trenches. The excavated sediments were used to fill the north end of the trenches and were immobilized in the Process Trench Spoils Area. The excavation resulted in the removal of 0.3 m (1 ft) and 1.3 m (4 ft) of contaminated soil from the sides and bottom of each trench, respectively. The 300 Area Process Trenches Waste Site was closed out under EPA/ROD/R10-96/143. Approximately 34,000 metric tons (37,479 tons) of material and six 208 L (55 gal) drums of sediment were transported to ERDF.	BHI-01164	July 1997	Feb. 1998	34,386 + 6 (55 gal) drums	4.3	As	14.7	/	15.1	12.8	/	12.1
											Thallium	3.6 U	/	3.5 U	N/A	/	N/A
											Benzo(a)pyrene	0.37 U	/	0.36 U	N/A	/	N/A
											chrysene	0.37 U	/	0.38	N/A	/	N/A
											PCBs	0.26 U	/	0.25 U	N/A	/	N/A
											Co-60	0.04	/	0.12	0.04	/	0.08
											U (total)	310	/	196	229.7	/	171.8
331 LSLDF	Drain/Tile Field	300-FF-2	45 × 12	1970-1974	The 331 LSLDF is an abandoned drain field. The unit is fed by one diversion box and four septic tanks. The unit discharged sanitary wastewater, and potentially animal waste, from the 331-A and 331-B Buildings for discharge into the soil column. The site was abandoned in place after the waste system was connected to the 300 Area Sanitary Sewer. The waste line has been capped west of the septic tanks.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
331 LSLT1	Trench	300-FF-2	2.13 (depth) × 2.13 (Overburden)	1966-1969	The unit received sanitary wastewater and animal waste from the animal waste pit. Since most of the animal studies involved the use of radio isotopes, animal waste was segregated on the bases of activity. Solid animal waste, exceeding 200 pCi/g specific activity, was transported to 100-F trenches regularly. All other solid animal waste (less than 200 pCi/g specific activity) was allowed to flush into the 331 Waste System. However, specific cases of contamination have occurred at the 331 Complex.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
331 LSLT2	Trench	300-FF-2	2.13 (depth) × 2.13 (Overburden)	1966-1974	The unit received liquid animal waste from the animal waste pit. Animal wastes were the most prominent wastes, in terms of volume, generated by the 331 Complex. Originally, liquid animal wastes from the complex including wash downs from the “hog and dog runs” were disposed to a large, unlined pit, east of the 331-D Building. Sewers carrying animal waste from the 331 Complex were also connected to this pit.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
333 ESHWSA	Storage Area	300-FF-2	Not documented	1964	The 333 Building East Side Hazardous Waste Storage Area (333 ESHWSA) was a part of the asphalt paved area near the northeast comer of the 333 Building, within the building fence line. For many years, the fenced area behind 333 Building had been used for storage of miscellaneous wastes in drums. The area contained small quantities of miscellaneous waste oils, cutting lubricants, chemicals, and solvents stored in containers. In previous years, the area was used for miscellaneous radioactive and hazardous waste storage. The 333 ESHWSA waste site is being interim closed out with the 618-1 waste site.	CVP-2010-00001; WSRF 2010-027	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1	Same as for 618-1

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
333 West Side Test Facility	Storage Tank	300-FF-2	6 × 4.21 × 0.40	1972	The Waste Oil Tank was used for storage of oil from the extrusion press sump. It was verified that the oil did not contain PCBs and was not ignitable before removal. No known releases have been reported. The Uranium Bearing Acid tanks stored spent acid containing uranium. The uranium was a recoverable asset for recycling.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
340 Complex	Storage Tank	300-FF-2	Not documented	1953 active	The 340 Complex consists of Buildings 340, 340-A, 340-B, 3707-F, office trailers, the 307 Retention Basins, two tanks in an underground vault, six tanks in 340A, underground transfer pipes, load-out and decontamination equipment, instrumentation, and before 1963, the 316-3 Trenches, which disposed of retention process waste that met release criteria. The Complex was built from 1951 to 1953 to support the 325, 326, 237, and 329 Buildings, relieve stress on the South and North Process Ponds, and provide a method for disposing of potentially contaminated "retention" waste liquids. The waste liquids passed through the RPS line to the 307 Retention Basins to wait until the radioactivity was below a threshold value before being sent to the 307 Trenches. Liquid with radioactivity above the threshold value was transferred to 56,781 L (15,000 gal) collection tanks in the 340 Building before being hauled to the 200 Area for disposal. Allowable discharge to the basins was 4 g/L gross beta and 0.5 g/L plutonium. Later, the limit became 50,000 pCi/L. The RLWS collected liquid process waste from the laboratories and the 308, 309, and 324 Buildings and sent the wastes directly to the 340 Building tanks. The 307 Trenches operated from 1953 to 1963 during which time they received 1 million L (264,172 gal) of uncontaminated low-level radioactive waste waters from the 307 Retention Basins once the waste streams were below the discharge limits. After the 307 Trenches were removed from service in 1963, waste liquids went to the process sewer for disposal in the Process Ponds. The 307 Trenches were excavated; the contaminated soil was sent to the 618-10 Burial Ground. In 1965 the trenches were backfilled with 7,645 m^3 (25,082 ft^3) of uranium-contaminated sediment from the SPP and fly ash. During normal operations, leaks occurred at transfer points of the 340 Building and at the 340-B rail load-out facility. A leak test in 1976 of the single-walled RLWS network showed widespread leaks. The system was replaced in 1978 to 1979 with double-walled, stainless steel pipes, and a leak detection system. During replacement, some contaminated soil was removed, but the RLWS piping and low radioactive level soil remains.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3712 USSA	Storage	300-FF-2	Not documented	1961-Present	The building is used to store uranium fuel elements, fuel fabrication components, and uranium scraps from the 313 and 333 fuel fabrication efforts.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
UPR-300-1	UPR	300-FF-2	7.62 (depth) × 3.7 (dia.)	1969	The site was a release to the soil in the area between the 307 Retention Basins and the 340 Building. The waste discharged to the soil column consisted of process effluent contaminated by TRU fission products including 900 Ci of short-lived radionuclides (mainly promethium-147) and 10 Ci each of Sr-90 and Cs-137. The top 0.61 m (2 ft) of the contaminated soil was placed into drums and taken to a 200 Area Burial Ground. Further removal of contaminated soil was considered a threat to adjacent structures. There is no readily apparent sign of subsurface contamination beneath the gravel-covered area. More than 90% of the contamination is confined to an area 3.7 m (12 ft) in dia. And 7.62 m (25 ft) deep.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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UPR-300-2	UPR	300-FF-2	Not documented	1954	The site appears to be multiple releases from ongoing decontamination and waste handling activities starting in January 1954. It is unknown if this was related to a single event or all events over the period (1954 to date). 10 mCi of Cs-137 is provided in the original source document and is designated as an estimate only.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
UPR-300-4	UPR	300-FF-2	30.53 × 0.5 × 6.1	Not documented	The site is the soil beneath and south of the 321 Building. The site represents a number of releases that occurred from 1945 to 1988. Because removal of all of the contaminated soil was a threat to the integrity of the 321 Building, it was not attempted. No specific occurrence reports have been identified. The true extent of the soil contamination is unknown.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
UPR-300-5	UPR	300-FF-2	1.22 × 6.10 × 0.46	1973	The site was a release that contaminated the storage basin area, the filter vault, the stack base, the truck stall, and the truck ramp outside the 309 Building. The waste was low-level radioactive water. The primary isotope was Cs-137.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
UPR-300-8	UPR	300-FF-1	Not documented	9/20/1980 – 9/22/1980	UPR-300-8 was associated with the caustic storage tank in the 311 Tank Farm and the 316-5 Process Trenches. The release was confined to the 300 Area Process Trench. A defective valve in the storage tank steam sparge line allowed steam condensate to overflow the caustic storage tank contents into the process sewer system. The release consisted of 50% sodium hydroxide solution. The pH in the process sewer was 11.95.	BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164
UPR-300-9	UPR	300-FF-1	Not documented	7/3/1976 – 7/5/1976	Nitric acid drained from a storage tank in Room 120 of Building 306-W and drained to the process sewer leading to the north (316-5) process trench. Groundwater analysis showed that the lost uranium and acid never reached the trench. The release consisted of nitric acid solution containing 121.5 kg (267.9 lb.) of depleted uranium. The draining system was dye tested. Fluorescein dye was added to the floor drain and showed that the system was free of leaks.	BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164
UPR-300-10	UPR	300-FF-2	Not documented	1977	The site was an UPR to the soil beneath the northwest corner of the 325 Building. UPR-300-10 occurred in the radioactive waste sewer line that served the 325-B Hot Cells, between the west basement wall of Room 32 and the north foundation wall of Room 202 of Building 325. The release included waste from dissolution of highly radioactive samples including irradiated reactor fuels.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
UPR-300-11	UPR	300-FF-2	0.61 × 0.91 × 7.62 × 2.13 (depth)	1977	The site was a release to the soil that involved a 1.22 m (4 ft) dia. Column of gravel-covered soil in the 340 Complex yard. The release occurred around and below a leaking flanged-tee that connected the RRLWS to the 340 Vault. Soil samples collected near the broken pipe were analyzed and yielded concentrations of 0.2 µCi/cm^3 Sr-90, 0.24 µCi/cm^3 Eu-155, 0.09 µCi/cm^3 Ce-144, 0.0017 µCi/cm^3 Pu-239/240, and 0.014 µCi/cm^3 Am-241 and Pu-238. Approximately 1 Ci of contamination was left in place.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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UPR-300-12	UPR	300-FF-2	12.19 × 0.30	1979	UPR-300-12 occurred in the basement floor of the 325-A Building. The waste migrated through cracks in the floor to the soil beneath the building. The site received radioactive rinse water overflow containing nitrate ions, promethium-147, fission products, and TRU nuclides. The total activity in the rinse water was estimated to be 70 Ci, of which 95% was Pm-147. The rinse water contained nitrate ions, Pm-147, fission products, and TRU radionuclides. Nitrate ions, but no radionuclides, were detected in samples taken from a nearby groundwater monitoring well. PNL) reports that coring through the cement floor of Room 50-A and sampling of the soils below was completed on 1/26/1979. Decontamination efforts on Room 50-A were completed. Removal of the contaminated soil under the building was considered a threat to the integrity of the 325 Building.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
UPR-300-15	UPR	300-FF-1	Not documented	8/19/1980	The site was a release that flowed into the 313 Process Sewer leading to the 316-5 Trench. UPR-300-15 was associated with uranium- bearing acid storage Tanks 3 and 4, the overflow catch barrel in Building 313, and the 316-5 Process Trenches. The spill was completely contained by the process sewer system, posing no risk to workers, the public, or the environment at the 313 Building. The system engineer rinsed the residual acid out of the sewer with rinse water and caustic (sodium hydroxide) to help neutralize the acid. The defective valves were replaced. The waste contained uranium-bearing acid.	BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164
UPR-300-17	UPR	300-FF-2	30 m^2	1979	The release site was the asphalt area at the southeastern corner of Building 333. The waste consisted of oily rags and other waste material, including uranium shavings. Cleanup effectiveness is not documented.	EPA, 2001; RSVP-2010-014	May 2009	May 2009	445	1	U-233/234	18.1	/	/	5.33	/	/
											U-235	2.90	/	/	0.793	/	/
											U-238	12.4	/	/	3.89	/	/
											Sb	0.370	/	/	/	/	/
											As	2.98	/	/	2.53	/	/
											Ba	92.5	/	/	80.5	/	/
											Be	0.317	/	/	0.240	/	/
											B	7.24	/	/	3.52	/	/
											Cd	0.325	/	/	0.157	/	/
											Cr (total)	26.0	/	/	13.3	/	/
											Co	7.38	/	/	6.65	/	/
											Cu	19.4	/	/	15.0	/	/
											Pb	20.0	/	/	11.4	/	/
											Mn	325	/	/	282	/	/
											Hg	0.0694	/	/	/	/	/
											Mo	0.578	/	/	0.414	/	/
											Ni	1,250	/	/	283	/	/
											Ag	0.340	/	/	/	/	/
											V	56.0	/	/	51.6	/	/
											Zn	278	/	/	102	/	/
											TPH-motor oil	260	/	/	180	/	/
											TPH-diesel	2.95	/	/	/	/	/

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
											Acenaphthene	0.117	/	/	/	/	/
											Acenaphthylene	0.405	/	/	/	/	/
											Anthracene	0.0111	/	/	/	/	/
											Benzo(a)anthracene	0.108	/	/	0.0256	/	/
											Benzo(a)pyrene	0.0672	/	/	0.0172	/	/
											Benzo(b) fluoranthene	0.670	/	/	0.0185	/	/
											Benzo(ghi)perylene	0.0152	/	/	/	/	/
											Benzo(k) fluoranthene	0.0398	/	/	0.0102	/	/
											Chrysene	0.827	/	/	0.0242	/	/
											Fluoranthene	0.225	/	/	0.0533	/	/
											Fluorene	0.00293	/	/	/	/	/
											Indeno(1,2,3-cd)pyrene	0.00974	/	/	/	/	/
											Phenanthrene	0.0727	/	/	0.0321	/	/
											Pyrene	0.154	/	/	/	/	/
											Aroclor 1248	1.97	/	/	/	/	/
											Aroclor 1254	0.819	/	/	2.37	/	/
											Aroclor 1260	0.196	/	/	0.244	/	/
UPR-300-19	UPR	300-FF-1	Not documented	9/30/1980	The release originated at the 313 Building floor trenches and was confined to the 300 Area Process Trench. Two 53 L (14 gal) drums of incoming deoxidization chemicals (nitric sulfuric chromic acid mixture) were found to be leaking. After the leaks were discovered, the floor was washed off, resulting in discharge to the process sewer. The process sewer showed high nitrate, fluoride, and pH values because of this incident. The event is documented in SO-80-12. The waste contained nitric, sulfuric, and chromic acid, followed by an ammonium bifluoride and sodium hydroxide discharge with incoming acid used in copper component deoxidizing. The leaking drums were repacked to prevent further release.	BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164
UPR-300-20	UPR	300-FF-1	Not documented	8/19/1980	The release originated at the 313 Building Uranium Recovery Area and confined to the 300 Area Process Trenches. On 8/19/1980, an overflow of a storage tank in the 313 Building resulted in an overflow of the catch barrel into the process sewer system. The release was documented on Occurrence Report 80-26. The release consisted of nitric and sulfuric acids with uranium in solution, quantity unknown.	BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164
UPR-300-21	UPR	300-FF-1	Not documented	8/5/1980	The release originated in the 333 Building and was confined to the 300 Area Process Trench. UPR-300-21 was associated with Tanks 13, 15, and 16 in Building 333 and the 300 Area Process Trench. The tanks were removed and the fill lines were capped off. Nitric acid fill lines to Tanks 13, 15, and 16 in the 333 Building were removed. Some residual nitric acid from these lines was discharged into the process sewer. The waste contained a small quantity of nitric acid.	BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164

Table B-1. Summary of 300 Area CERCLA Waste Sites

Site Code	Site Type	OU	Site Dimensions (m) OR m^2	Operation Dates	Site Description	Decision Documents	Remedial Action Start Date	Remedial Action End Date	Waste to ERDF (metric tons)	Maximum Remedial Action Depth (m)	Contaminant of Concern	Max Concentration (pCi/g, mg/kg)			95% UCL (pCi/g, mg/kg)		
												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
UPR-300-22	UPR	300-FF-1	Not documented	1980	UPR-300-22 originated in the 333 Building Chemical Bay Area, but was confined to the 300 Area Process Trench. UPR-300-22 was associated with Tanks 13 and 15 in Building 333 and the 300 Area Process Trench. Acid Etch Tanks No. 13 and 15 were leaking, discharging acid into the process sewer. The waste consisted of a small quantity of etch acids (nitric and hydrofluoric acids). The tanks were removed from service.	BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164
UPR-300-23	UPR	300-FF-1	Not documented	8/1980	UPR-300-23 originated in the 333 Building nitric and sulfuric acid fill lines and was confined to the 300 Area Process Trench. Leak inspection revealed two leaks in the nitric and sulfuric acid fill lines. The waste consisted of a small quantity of incoming etch acids (nitric and sulfuric acid). The leaks were repaired.	BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164
UPR-300-24	UPR	300-FF-1	Not documented	8/1980	UPR-300-24 originated at the 333 Building Waste Acid System and was confined to the 300 Area Process Trench. Leak inspection revealed two small drip leaks around a newly installed etch tank. The waste consisted of a small quantity of waste etch acids (nitric and hydrofluoric acid). The leak was repaired.	BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164
UPR-300-25	UPR	300-FF-1	Not documented	2/15/1980	UPR-300-25 originated in the steam coils in the Uranium Mill Tank Number 32 in the 333 Building and was confined to the 300 Area Process Trench. Leaks in steam coils in the uranium mill tank caused acid to be siphoned into the cooling coils at the nightly shutoff. During startup in the morning, steam discharged the acid in the coils into the process sewer system. The waste consisted of a small quantity of uranium etch acids (nitric and sulfuric acid) in uranium solution. The leaking coils were repaired.	BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164
UPR-300-26	UPR	300-FF-1	Not documented	1/12/1980	UPR-300-26 originated in the Caustic Storage Tank in the 311 Tank Farm and was routed to the 300 Area Process Trench for disposal. Condensate from a steam heating line in the caustic storage tank caused overflow to the process sewer. The waste consisted of a very small quantity of 50% sodium hydroxide consisting of less than 0.05 kg (0.1 lb) of sodium hydroxide. The steam line was shut off to stop the discharge.	BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164
UPR-300-27	UPR	300-FF-1	Not documented	10/30/1979	UPR-300-27 originated in the Uranium Bearing Acid Storage Tank piping in the 333 Building and was routed to the 300 Area Process Trench. Failure of a check valve in the piping system resulted in discharge of a stream of uranium-bearing acid into the 300 Area process sewer system. An operator noticed the leakage and immediately shut down the transfer pump, stopping the release. The spilled solution was washed into the 300 Area process sewer system. The waste contained an unknown quantity of uranium-bearing acid waste consisting of nitric and sulfuric acids.	BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164
UPR-300-28	UPR	300-FF-1	Not documented	6/1978	UPR-300-28 originated with an overflow into the 334A Containment Pit from the 334A Storage Tank. The UPR was routed to the 300 Area Process Trench. An open water fill line in the 333 Building caused the process tank to overflow into the 334A Storage Tanks, which overflowed into the containment pit. The pit then overflowed into the process sewer system. Overflow to the process sewer apparently began at 7:30 a.m. on 6/3/1978, and was discovered on the morning of 6/5/1978. The release consisted of solution containing hydrofluoric, nitric, and sulfuric acids with copper, uranium, and zirconium in solution. The sewer pH monitor indicated the pH dropped from 7.4 to 6.8 after the solution from the pit entered the sewer, indicating very little acid was dumped into the sewer. In FY 1998, the R 12 refrigerant in all eight chillers was replaced with R 134A, which is nonhazardous and non-ozone depleting.	BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164

Table B-1. Summary of 300 Area CERCLA Waste Sites

Site Code	Site Type	OU	Site Dimensions (m) OR m^2	Operation Dates	Site Description	Decision Documents	Remedial Action Start Date	Remedial Action End Date	Waste to ERDF (metric tons)	Maximum Remedial Action Depth (m)	Contaminant of Concern	Max Concentration (pCi/g, mg/kg)			95% UCL (pCi/g, mg/kg)		
												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
UPR-300-29	UPR	300-FF-1	Not documented	6/1975	UPR-300-29 originated as leaks in the PVC piping in the chemical waste system in the 333 Building. The release was routed to the 300 Area Process Trench for disposal. Leak testing of the system revealed three leaks in the PVC piping system. In addition, one leak was found in the incoming nitric acid supply line. The waste consisted of an unknown quantity of waste etch acids containing hydrofluoric, nitric, sulfuric, and chromic acids with copper, uranium, and zirconium in solution.	BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164
UPR-300-30	UPR	300-FF-1	Not documented	1/30/1975	UPR-300-30 was associated with the waste receiving tank and chemical processing tanks in the 333 Building and the 300 Area Process Trench. A chemical reaction occurred when a carbonate-bearing solution was added to the waste acid solution. This caused foaming and eventually an overflow of the process tanks that discharged to the process sewer. The waste consisted of a small quantity of waste etch acids and spent film chemicals containing hydrofluoric, nitric, sulfuric, and chromic acids.	BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164
UPR-300-32	UPR	300-FF-1	Not documented	1974	UPR-300-32 occurred within the uranium- bearing system in Building 333 and was routed to the 300 Area Process Pond. Leak testing of the system revealed one leak in the piping, three leaking transfer pumps, and five leaks in the uranium mill tank. The waste consisted of an unknown quantity of uranium etch acids containing nitric and sulfuric acid with uranium in solution.	CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002
UPR-300-33	UPR	300-FF-1	Not documented	1974	UPR-300-33 occurred in the acid drain system and incoming acid fill line in the 333 Building and was routed to the 300 Area Process Pond. A leak test in the chemical waste drain system revealed 16 leaks from the 333 Building to the 334-A Building. Additionally, five leaks were found in the incoming acid fill lines (presumably nitric or sulfuric acid system). The waste consisted of an unknown quantity of waste etch acids containing hydrofluoric, nitric, and chromic acids with copper, uranium, and zirconium in solution.	CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002
UPR-300-34	UPR	300-FF-1	Not documented	1973-1975	On 8/1/1973, failure of the limestone neutralization tank resulted in a discharge of acidic waste solutions to the ground beneath the tank (WIDS 300-21 report) and the routing of the acid waste to the process pond. Potential COCs are those generated by the 333 N Fuels WATS processes. These can include nitrate and sulfate salts of Cr(VI), uranium, copper, aluminum, beryllium, nickel, manganese, hexafluorozirconates, and iron. The potential acids involved include nitric acid, sulfuric acid, and hydrofluoric acid. An unknown quantity of waste etch acids were discharged to the soil. The waste etch acids contained hydrofluoric, nitric, and chromic acids with copper, uranium, and zirconium in solution. The site of the limestone neutralization tank was partially excavated during removal of the failed tank. It is assumed that some of the acid-contaminated soil beneath the tank was removed and the subsoil area was neutralized with water and sodium bicarbonate.	CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002
UPR-300-35	UPR	300-FF-1	Not documented	1973	UPR-300-35 occurred in the acid overflow alarm system behind Tank 32 in the 333 Building Uranium Bearing Acid Facility and in a uranium-bearing acid transfer pump. The UPR was routed to the 300 Area Process Pond (316-1). A leak was discovered in the overflow alarm system in the uranium mill tank. The uranium acid transfer pump was also discovered to be leaking. The waste consisted of an unknown quantity of uranium- bearing etch acids containing nitric and sulfuric acids with uranium in solution.	CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
UPR-300-36	UPR	300-FF-1	Not documented	1973	UPR-300-36 occurred in the acid drain system and incoming nitric acid lines of the 333 Building. The waste was routed to the 316-1, 300 Area Process Pond. Leak testing of the acid drain system showed nine leaks. Four leaks were also found in the incoming nitric acid lines. The waste consisted of an unknown quantity of waste etch acids containing hydrofluoric, nitric, and chromic acids with copper, uranium, and zirconium in solution. The leaks were repaired and the release was routed to the 316-1, 300 Area Process Pond for disposal.	CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002
UPR-300-37	UPR	300-FF-1	Not documented	1972	UPR-300-37 occurred in the 333 Building Waste Acid System and was routed to the 316-1 300 Area Process Pond. Leak testing of the waste line revealed several large and numerous small leaks that discharged directly to the process sewer. The waste consisted of an unknown quantity of waste etch acids containing hydrofluoric, nitric, and chromic acids with copper, uranium, and zirconium in solution. The release was routed to the 300 Area Process Pond for disposal.	CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002
UPR-300-38	UPR	300-FF-2	Not documented	Not documented	The site is the contaminated soil beneath the 313 Building, as well as the concrete foundation. The full extent of contamination will not be determined until the 313 Building foundation has been removed and soil remediation occurs. The contamination resulted from multiple UPR events. Materials released to the soil beneath the building may have included uranium-bearing acid (nitric and sulfuric acid with uranium in solution), neutralized acid waste (typically sodium fluoride, sodium nitrate, sodium dichromate, and sodium sulfate in solution with precipitates of uranium, chromium, copper, and zirconium), etch acids (nitric, hydrofluoric, sulfuric, and chromic acids), TCE (PCE), sodium hydroxide solutions, and contaminated water.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
UPR-300-39	UPR	300-FF-2	Not documented	1954	The release site was to the soil adjacent to the caustic storage tanks in the 311 Tank Farm. The waste consisted of caustic solution containing 50 percent sodium hydroxide solution. If the sodium hydroxide were exposed to uranium contamination (likely the case), the resultant contamination will be sodium diuranate (“yellow cake”). In February 2006, the 311 Tank Farm and concrete containment was demolished. Before demolition, the two sodium hydroxide tanks were labeled “Empty.” The location and extent of the release is not discernible in the field.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
UPR-300-40	UPR	300-FF-2	Not documented	1974	The release site was to the soil between the 311 Tank Farm and the 303-F Building. Piping connections were repaired. Apparently, removal of contaminated soil was not pursued. The waste consisted of uranium-bearing acid waste containing nitric and sulfuric acid with uranium in solution and chromic acids with copper and zinc in solution. A comparison of WIDS Sites UPR-300-31 and UPR-300-40 and their reference documents was performed, and the conclusion was that they both represented the same event. It was decided to join them under WIDS Site UPR-300-40.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
UPR-300-41	UPR	300-FF-2	Not documented	6/3/1986	113.60 L (30 gal) of the liquid, which is categorized as extremely Honeywell, leaked from the drum situated on an asphalt pad; it contaminated part of the asphalt pad and an area of soil next to the pad. The released liquid consisted of phosphoric acid with the following constituents: 14,000 ppm chromium, 1,900 ppm manganese, 1,700 ppm iron, and 400 ppm nickel. The liquid released was from a leak in a 208 L (55 gal) drum situated in an asphalt pad.	Not documented	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
UPR-300-42	UPR	300-FF-2	Not documented	10/12/1983	The release was an overflow of No. 6 fuel oil onto the ground adjacent to the Number 2 Day Tank, an UST. The release consisted of approximately 750 to 1135 L (200 to 300 gal) of No. 6 fuel oil. The adjacent day tanks (300-223) have been remediated, but this release was not removed because of concerns regarding the foundation of the building. The surface area around the day tanks was paved with asphalt. This release is not visible.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
UPR-300-45	UPR	300-FF-2	Not documented	1985	The release site was to the soil beneath the transfer piping, adjacent to the 303-F Building. The leak contained uranium-bearing waste acid identified as nitric and sulfuric with uranium in solution. Analysis showed the solution to contain 3,480 ppm nitrate, 6,960 ppm sulfate, and 920 ppm uranium. Some soil from the release site was exhumed, packaged, and sent to the Low-Level Burial Grounds for disposal. The effectiveness of the cleanup is undetermined. The remaining soil beneath the pipe trench and around the processing facilities is expected to be addressed separately after the RCRA closure plan activities are completed.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
UPR-300-46	UPR	300-FF-2	Not documented	1989	The release site was a layer of radioactively contaminated soil found during a pipe trench excavation. The contaminated soil was analyzed, and it was determined that the soil did not contain any significant quantities of hazardous chemicals. The truckload of contaminated soil was disposed of as low-level waste. The contamination was likely caused by a spill of uranyl nitrate. There is currently no visual evidence of the release.	EPA, 2001; CVP-2010-00004; WSRF 2010-009	April 2009	June 2009	131	1	Same as for 300-109	Same as for 300-109	Same as for 300-109	Same as for 300-109	Same as for 300-109	Same as for 300-109	Same as for 300-109
UPR-300-47	UPR	300-FF-1	Not documented	4/30/1993	UPR-300-47 originated at the number 3 water chiller, drained to the sump, and discharged to the process sewer in the 309 Building and process trenches (316-5). The release was the result of the failure of the expansion joint in the number 3 water chiller. The sump had collected the ethylene glycol and discharged approximately 3,030 L (800 gal) of 38% ethylene glycol solution to the process sewer before being turned off. Liquid samples taken at the process trench weir box on 4/30/1993, at approximately 6:30 a.m. indicated ethylene glycol concentrations of approximately 3,000 ppm. Samples taken at 7:00 p.m. indicated non-detectable amounts of ethylene glycol. Preliminary results from four downgradient wells indicate of ethylene glycol concentrations of 5 ppm. It is possible that the sediment near this area has some contamination, but it is assumed that most of the ethylene glycol went to the groundwater, where it was diluted in the underlying aquifer. The release site cleaned up and waste generated during the cleanup was disposed of properly on 5/7/1993.	BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164	Cleaned up with 316-5. See BHI-01164
UPR-300-48	UPR	300-FF-2	Not documented	1991	The site received radioactive liquid from a leak in the process sewer drainpipe. The site was discovered during dye testing of drains during development of the Facility Effluent Monitoring Plan development for the 325 Building. The contamination may have resulted from routine releases and accumulated in the soil under the crack. Radioactivity up to 1,700 dpm alpha was detected. The TCLP results were below regulatory limits. Radioactivity levels were sufficiently low to permit fixing the contamination in place. This activity was reported as an off normal occurrence in October 1991 (RL-PNL-325-1991-1023).	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table B-1. Summary of 300 Area CERCLA Waste Sites

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
UPR-300-FF-1	UPR	300-FF-1	Not documented	Not documented	The site consisted of multiple contaminated areas identified in 1990 during the 300-FF-1 OU RI. The release sites were associated with WIDS Sites 300-44, 300-49, 300-50, 300-51, the SPP, and 316-2 North Process Pond. The UPR file listed 77 individual areas of surface or near surface contamination (identified as R-1 through R-77) ranging from 15 cm to 15 m (6 in to 50 ft) in dia. And larger areas measuring up to 24 × 61 m (80 × 200 ft). Three areas of subsurface disturbance were identified and named Landfills 1A, 1B, and 1C. Landfills 1A (300-49) and Landfill 1B (300-50) have been surface stabilized. The debris at Landfill 1C (300-51) has been removed. An area adjacent to the west end of 618 4 (300-44) appears to be shallow buried material and was surface stabilized. These areas are entered into the WIDS database as separate waste sites. Primarily, contamination was associated with the soil; however, some contaminated metal and other materials were also found. GM/P-11 instrument readings range from 100 to 50,000 counts/min. Analysis of samples showed that the radiation levels were caused primarily by the presence of uranium. Some soil samples also contained relatively high concentrations of copper.	CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002	Cleaned up with 316-1. See CVP-2003-00002
400 Process Pond and Sewer System	Pond	300-FF-2	Not documented	1979-present	This site is the 400 Area Secondary Cooling Water (400 Area Process Sewer). The unit consists of underground piping, a control structure, and two percolation ponds known as 4608B and 4608C. The process sewer, which empties into the process ponds, is for discharge of water from cooling systems and non-sanitary drains and sumps in the 400 Area facilities, including FFTF. Water from FFTF and FMEF cooling towers contains non-regulated quantities of algaecides and other treatment chemicals, including a biocide (Dearcide 702), a microbiocide (sodium hypochlorite), and a softening agent (Dearborn 878). Chemicals used for secondary cooling water testing (Dearborn Code 550, 562, 595, 899, 904) are also present in unregulated quantities.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
400-37	Storage Tank	300-FF-2	Not documented	Not documented	The site is an underground fuel oil tank. No visual evidence of the tank exists on the surface. The tank supplied diesel fuel to a standby electric generator. Drawing H-4-152061 has a written notation that the fuel oil tank was abandoned in place and that the exact location of the fuel line is unknown. It may have been filled with sand.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
400-38	Storage Tank	300-FF-2	Not documented	Not documented	The site is an underground fuel tank that supported 4722A. There is no visual evidence of the tank on the surface. Drawing H-4-152061 has a notation reading “buried fuel tank.” It is possible the tank has been filled with sand, but documentation has not been found.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
600-22	Dumping Area	300-FF-2	0.25 mi^2	1942	This site appears on aerial photographs as a large, asterisk-shaped area. It is an old bombing target site that was used by the U.S. military for practice with live bombs. According to Site personnel, the asterisk-shaped area was used for bombing practice around 1942, before construction began on the Hanford Site reactors. Bomb fragments are scattered throughout the site but are concentrated at the site’s southeastern comer. No unexploded bombs have been found in the area.	Not documented	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
600-46	Dumping Area	300-FF-2	12 × 1 × 1	1995	The site contained used diesel oil filters, an empty can of starting fluid, pieces of lumber, and an empty 208 L (55 gal) drum. It was the consensus of RL, EPA, and Ecology that the only potential contaminants involved with past use of the site were TPH, PCBs, and possibly lead, cadmium, and chromium.	CCN 022804	6/15/1995	7/10/1995	10	1	EPA/Ecology discussion results: 600-46 could be addressed by an RL voluntary action.	EPA/Ecology discussion results: 600	46 could be addressed by an RL voluntary action.	EPA/Ecology discussion results: 600	46 could be addressed by an RL voluntary action.	EPA/Ecology discussion results: 600	46 could be addressed by an RL voluntary action.

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600-47	Dumping Area	300-FF-2	Consists of seven subsites	Not documented	The site consisted of several areas of surface debris and contamination near the banks of the Columbia River. Debris includes concrete, brick, cinder block, glass, stainless steel, steel millings/filings, plastic, tar roofing paper, wire, pipe, bottles, sheet metal, screen, clay pipe, irrigation pipe, etc. Concreted soils were found during test diggings, burned wood was found on top of the rise.	CVP-2005-00005	December 2004	5/25/2005	2,159	surficial	U	2.96	/	/	2.79	/	/
600-63	Laboratory	300-FF-2	39.6 × 39.6	1978-2007	The site is potentially contaminated soil and equipment. The site is enclosed within a chain link fence with barbed wire top and a locked gate. Outside the fence, there is a considerable amount of debris. A trace amount of Co-60 was mixed in 1 cm (0.4 in.) of soil and placed 60 cm (24 in.) below the surface of two of the drainage lysimeters. Trace amounts of tritium were placed in two other lysimeters. The migration of the contaminants was monitored. There is buried equipment, including caissons, lysimeters, associated instrumentation, and solar panels. It is unknown if any of this equipment is contaminated. If it were, contaminants of potential concern would certainly include Co-60 and tritium.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
600-243	Surface Impoundment	300-FF-2	48 × 39	Not documented	The site is a treatment facility for petroleum-contaminated soil. The waste is petroleum-contaminated soil from Project LO-44, UST Removals.	WSRF 2007-033	August 2007	August 2007	3,735	Not documented	Sb	1.3	/	/	/	/	/
											As	5.8	/	/	4.9	/	/
											Ba	426	/	/	318	/	/
											Be	3.8	/	/	2.9	/	/
											B	497	/	/	267	/	/
											Cd	1.4	/	/	1.0	/	/
											Cr (total)	24.3	/	/	17.0	/	/
											Co	7.4	/	/	6.0	/	/
											Cu	71.5	/	/	65.2	/	/
											Pb	69.9	/	/	33.6	/	/
											Li						
											Hg						
											Mn	298	/	/	254	/	/
											Mo	2.6	/	/	2.0	/	/
											Ni	33.5	/	/	20.0	/	/
											Se	11.0	/	/	6.9	/	/
											Ag	0.67	/	/	/	/	/
											V	55.9	/	/	46.8	/	/
											Zn	126	/	/	75.1	/	/
											TPH-diesel	170	/	/	220	/	/
											TPH- motor oil	620	/	/	520	/	/
											Benzo(a)anthracene	0.047	/	/	0.14	/	/
											Benzo(a)pyrene	0.046	/	/	/	/	/
											Benzo(b) fluoranthene	0.063	/	/	0.15	/	/

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
											Benzo(ghi)perylene	0.044	/	/	/	/	/
											Benzo(k) fluoranthene	0.033	/	/	0.16	/	/
											Chrysene	0.081	/	/	0.10	/	/
											Dibenz(a,h) anthracene	/	/	/	/	/	/
											Fluoranthene	0.11	/	/	0.091	/	/
											Indeno(1,2,3-cd)pyrene	0.028	/	/	/	/	/
											Naphthanlene	0.52	/	/	0.23	/	/
											Phenanthrene	0.15	/	/	0.12	/	/
											Pyrene	0.086	/	/	0.11	/	/
											Aroclor 1254	0.067	/	/	/	/	/
											Aroclor 1260	0.036	/	/	0.021	/	/
											2-methylnaphthalene	0.66	/	/	0.34	/	/
											Di-n-butylphthalate	0.047	/	/	0.11	/	/
											Dibenzofuran	0.13	/	/	0.14	/	/
600-259	Experiment/ Test Site	300-FF-2	40 × 40 (fenced area)	1984-1994	The site is any contaminated soil associated with this facility. The site included the SWFL and the Grout Waste Test Facility (exhumed). The SWFL contained masonry cement, Portland cement, and vinyl ester styrene waste forms spiked with Mn-54, Co-60, Cs-134, and Cs-137. The waste forms were placed into the lysimeters at various depths. The leachate was collected and disposed of. The lysimeters were capped in 1995 to prevent any further water intrusion. The leachate was drained for the last time by PNNL in 1996. The Grout Waste Lysimeter caissons (A-1 and B-1) contained layers of waste, containing small amounts of both radioactive and non-radioactive tracer agents embedded into grout material. The waste layers were separated by layers of soil. The lysimeter caissons were buried below ground. The radioactive tracers used in this test were primarily Co-60 (up to 330 Ci/L) and lesser amounts of Co-58, Fe-59, Cr-51 and Mn-54 and trace amounts of other radionuclides. In 1991, there was also a release of 300 L of drainage containing trace amounts of Tc-99 from the bottom of one caisson containing cladding removal waste.	CVP-2005-00008	September 2004	7/21/2005	Not documented	Not documented	Cs-134	0.056 U	0.054 U		0.026 U	0.025 U	
											Cs-137	0.038	0.034	/	0.051 U	0.025	/
											Co-60	0.045 U	0.042 U	/	0.021 U	0.020 U	/
											Mn-54	0.037 U	0.04 U	/	0.017 U	0.019 U	/
											Tc-99	0.275 U	0.556 U	/	-0.0045 U	0.18 U	/
											Tritium	-1.37 U	0.389 U	/	-1.92 U	-0.656 U	/
											As	2.3	/	/	2.2	/	/
											Ba	81	/	/	67	/	/
											Be	0.50	/	/	0.50	/	/
											Cd	0.090	/	/	0.091	/	/
											Cr	7.4	/	/	5.3	/	/
											Pb	3.5	/	/	3.4	/	/
											U-234	1.03	1.74	/	0.84	1.07	/
											U-235	0 U	0.123 J	/	0.057	0.106	/
											U-238	0.81	1.81	/	0.758	0.995	/
											Pb	9.7	120	/	6.9	64	/
											As	3.7	4.80	/	/	/	/
											Aroclor 1242	0.036 U	0.0424	/	0.036	0.17	/
											Aroclor 1248	0.036 U	1.12	/	0.036	1.1	/
											Aroclor 1254	0.036 U	0.405	/	0.036	0.18	/
											Thallium	1.8	0.452	/	/	/	/

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
											Benzo(a) pyrene	0.35 U	3.50E-01 U	/	/	/	/
											Chrysene	0.35 U	3.50E-01 U	/	/	/	/
600-290	Loading Dock	300-FF-2	Not documented	Not documented	The site is a contaminated foundation near the soil mound identified as Waste Site 618-13. The structure had two components, a pad, and the loading dock. A gravel road leads to the pad on the north side where a truck could back up on the pad to the loading dock and offload drums of waste. Rust colored patterns in the shape of 308 L (55 gal) drums suggest that these were once stored on the loading dock. The site is located in the 300-FF-2 OU due west of Building 3720 at the end of a gravel road approximately 730 m (0.45 mi) west of Stevens Drive. Pad and loading dock used to store hexone from solvent extraction studies in the 321 Building. Hexone was stored in 208 L (55 gal) drums between March 1950, and June 1954, before burial in 618-9. Additional chemical storage may have included kerosene and uranyl nitrate hexahydrate. Although labeled a radiologically fixed area, contamination levels were not documented	EPA, 2001; see 618-13; CVP-2009-00005; WSRF 2009-055	January 2009	February 2009	4,300	Not documented	Th-232	2.16	/	/	1.46	/	/
											U-233/234	1.92	/	/	1.03	/	/
											U-235	0.277 U	/	/	/	/	/
											U238	1.70	/	/	1.02	/	/
											Sb	0.312	/	/	0.310	/	/
											As	3.50	/	/	3.16	/	/
											Ba	74.0	/	/	69.3	/	/
											Be	0.212	/	/	0.208	/	/
											B	1.05	/	/	1.03	/	/
											Cd	0.0625	/	/	0.0575	/	/
											Cr (total)	10.7	/	/	10.2	/	/
											Cr+6	0.20 U	/	/	/	/	/
											Co	6.29	/	/	6.39	/	/
											Cu	11.5	/	/	11.4	/	/
											Pb	3.62	/	/	3.61	/	/
											Mn	268	/	/	321	/	/
											Hg	0.0306 U	/	/	/	/	/
											Mo	0.420	/	/	0.362	/	/
											Ni	12.4	/	/	12.1	/	/
											U (metal)	4.78	/	/	2.80	/	/
											V	55.8	/	/	56.7	/	/
											Zn	41.4	/	/	41.1	/	/
											Acetone	0.0122	/	/	0.00755	/	/
											Acenaphthene	0.671 U	/	/	/	/	/
600-367	Burial Ground	300-FF-2	7 × 18	1982	The site pit was excavated to bury the remains of the equipment and trailer that were destroyed during a Hanford Site range fire in the 1980s. The equipment and temporary trailer were being used in support of the GEDF, which became operational in 1982 to support the development of technology for disposal of low-level radioactive wastes. The site use was to test burial ground subsidence control alternatives, including cold test demonstrations of geotechnical engineering prototype systems for in-situ isolation and stabilization of waste disposal structures.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
618-1	Burial Ground	300-FF-2	100 × 50	1945-1956	Two trenches received solid waste from early 300 Area facility operations, including the 305 Reactor, 3706 Laboratory, and the 3741 Building. The site contained large quantities of uranium (~14,500 kg [16 tons]) from the fuel fabrication activities and small quantities of plutonium and fission products from laboratory operations. Radiological readings indicated 6,000 dpm alpha and 15 mrems/hr beta/gamma. An August 1946 monthly report mentions burial of a bronze crucible that read 170 mrems/hr (179 mrads/hr) and 5.5 mrems/hr (5.5 mrads/hr) at 10.2 cm (4 in.). Remediation completion for this site includes completion of remedial action for: 1) subsites 333 ESHWSA (618-1:1) and 618-1 :2; 2) consolidated sites 333 LHWSA, UPR-300-13, and UPR-300-14; 3) collocated sites 300-110, 303-M SA, 303 M UOF, and 333 ESHWSA; and 4) and partial interim closure sites 300-15, 300-259, and UPR-300-17.	CVP-2010-00001; WSRF 2010-028	September 2008	September 2009	47,332	7.5	Cs-137	/	6.52	/	/	0.321	/
											U-233/234	11.3	69.9	/	1.58	31.8	/
											U-235	0.987	4.46	/	/	2.45	/
											U-238	8.23	65.2	/	1.34	29.9	/
											Sb	0.455	0.407	/	/	/	/
											As	6.09	4.58	/	2.24	2.36	/
											Ba	102	1,870	/	86.1	285	/
											Be	0.371	0.323	/	0.174	0.202	/
											B	3.74	6.60	/	1.09	1.34	/
											Cd	0.266	1.03	/	0.0675	0.248	/
											Cr (total	19.5	18.9	/	7.31	7.65	/
											Co	8.60	8.92	/	6.18	8.24	/
											Cu	23.8	68.7	/	11.1	36.2	/
											Pb	6.21	333	/	3.03	39.8	/
											Li	13.3	8.45	/	5.51	5.49	/
											Hg	0.198	8.94	/	/	/	/
											Mn	403	351	/	286	322	/
											Mo	0.356	2.14	/	0.321	0.438	/
											Ni	16.8	13.7	/	7.89	14.9	/
											Ag	1.12	1.29	/	/	/	/
											U (metal)	24.4	209	/	4.17	77.1	/
											V	64.7	70.9	/	54.6	69.4	/
											Zn	68.1	82.0	/	40.8	107	/
											Aroclor 1248	0.0351	/	/	/	/	/
											Aroclor 1254	0.981	1,240	/	0.183	1.58	/
											Aroclor 1260	0.0560	0.0992	/	0.0377	0.253	/
											Fluoride	0.9	3.3	/	/	2.0	/
											Nitrate	0.86	2.7	/	/	/	/
											Sulfate	62.9	244	/	/	/	/
618-2	Burial Ground	300-FF-2	49 × 9 × 4.6 (north trench); 54 × 15 × 4.6 (middle trench); 55 × 15 × 4.6 (south trench)	1951-1954	The waste site consisted of three east-west- oriented trenches. A GPR investigation, performed in 1995, identified three distinct trenches. Historical documents stated that there were either three or four trenches. The discrepancy of whether there are three or four trenches could be because the geometry of the middle trench is broken into two pieces at the east end. The unit was used for disposal of uranium-contaminated equipment and materials, plutonium, and fission products. The uranium waste was typically solid metallic uranium oxides in the form of metal cuttings from Reactor Fuel Fabrication facilities in the 300 Area. The plutonium and fission products came from 300 Area laboratory facilities that began to operate in 1953. The burial ground may also contain tin from the triple dip canning process and lead from the lead dip	CVP-2006-00010	11/1/2004	8/1/2006	71,049	6	As	1.90	1.80	/	1.9	1.4	/
											Ba	79.8	185	/	73.6	76.9	/
											Cd	9 U	0.14	/	0.09 U	0.09 U	/
											Cr	7.10	6.70	/	6.6	5.7	/
											Pb	5.60	6.60	/	4.9	5.5	/
											Sn	2.40	8.70	/	2.3	2.9	/
											Se	0.75	0.78	/	0.76	0.78	/
											U (total)	12.50	501	/	4.17	338	/

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
					process. In December 2004, during remedial excavation of this burial ground, a combination lock safe was unearthed. When opened, bottles of liquid waste were found.						Am-241	0.81	17.8	/	0.54	6.52	/
											Cs-137	2.24	1.04	/	1.5	0.914	/
											Co-60	0.048 U	0.049 U	/	0.021 U	0.023 U	/
											Eu-152	0.13 U	0.16 U	/	0.055 U	0.068 U	/
											Eu-154	0.17 U	0.18 U	/	0.070 U	0.080 U	/
											Eu-155	0.18 U	0.35 U	/	0.069 U	0.13 U	/
											Ni-63	5.95 U	4.44 U	/	0.498 U	0.261U	/
											Tritium	0.477 U	0.0713	/	0.0938 U	0.788 U	/
											Pu-238	0.068 U	1.50	/	0.056 U	1.08	/
											Pu-239/240	7.67	92.3	/	5.2	72.9	/
											Pu-241	9.65	42	/	14.5 U	34.3	/
											Sr-90	0.063	11.6	/	0.037 U	7.4	/
											U-233/234	5.02	161	/	0.93	108	/
											U-235	0.214	0.776	/	0.062	2.24	/
											U-238	4.98	165	/	1.07	111	/
618-3	Burial Ground	300-FF-2	121.92 × 51.21 × 4.57	1954-1955	The site consists of uranium-contaminated waste, primarily building materials from the remodeling of the 313 Building. It may also contain waste from the 303-J and K upgrades. In 1986, the volume of contaminated soil was estimated to be 12,549 m^3 (443,160 ft^3), with 12,643 m^3 (446,480 ft^3) of overburden.	CVP-2006-00005	9/9/2004	1/31/2006	30,878	Not documented	U-233/234	1.09	/	/	0.626	/	/
											U-235	0.038	/	/	0.170 U	/	/
											U-238	1.07	/	/	0.696	/	/
											As	3.1	/	/	2.7	/	/
											Ba	76.5	/	/	73.7	/	/
											Cd	0.14 U	/	/	0.082 U	/	/
											Cr	9.7	/	/	9.4	/	/
											Pb	3.9	/	/	3.8	/	/
											Se	0.66	/	/	0.61	/	/
											Ag	0.21 U	/	/	0.15 U	/	/
											U (total)	1.64	/	/	1.56	/	/
618-4	Burial Ground	300-FF-1	178.67 × 68.13	1955-1961	During remedial activities, drums of depleted uranium packed in oil were uncovered. The documented uranium inventory for this burial ground did not include the ~1,500 drums of depleted uranium. The estimated inventory is ~110,600 kg (243,800 lb).	CVP-2003-00020	February 1998	August 2003	46,585	11	As	3.2	2.2	/	3.1	2.1	/
											Pb	18.4	49	/	34	16	/
											U-234	3.22	20.20	/	/	/	/
											U-235	0.0481	1.09	/	/	/	/
											U-238	3.07	21.50	/	/	/	/
											U (total)	6.38	42.79	/	5.25	16.7	/
618-5	Burial Ground	300-FF-2	96 × 56 × 6	1945-1962	The site was one large (single) pit and received 300 Area waste from 1945 through 1962. It was also used as a burn pit. Honeywell-39076 states the area was a burning trench as well as a storage area for aluminum silicate containing 17% uranium and bronze crucibles with radiation levels up to 200 mr/hr. The site was used for the disposal of uranium-bearing trash. Characterization test pits dug in 1992 encountered radiologically contaminated lead bricks, steel pipes, wood fragments, and other	CVP-2003-00021	10/1/2002	9/1/2003	46,300	7.5	Asbestos	4.3	5.2	/	4.3	5	/
											Cd	0.51 U	0.51 U	/	0.24	0.47	/
											Cr	11.3	14.7	/	11	14	/
											Pb	6.1 J	82.3 J	/	5.7	34	/
											U-234	1.59	8.6	/	/	/	/

Table B-1. Summary of 300 Area CERCLA Waste Sites

Site Code	Site Type	OU	Site Dimensions (m) OR m^2	Operation Dates	Site Description	Decision Documents	Remedial Action Start Date	Remedial Action End Date	Waste to ERDF (metric tons)	Maximum Remedial Action Depth (m)	Contaminant of Concern	Max Concentration (pCi/g, mg/kg)			95% UCL (pCi/g, mg/kg)		
												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
					garbage. Asbestos was found in Test Pit 2.						U-235	0.137 U	0.462	/	/	/	/
											U-238	1.96	8.87	/	/	/	/
											U (total)	3.69	17.93	/	1.96	16.2	/
618-7	Burial Ground	300-FF-2	12 × 200 × 4 (fenced) 160 × 30 × 4 (trenches) 140 × 9 (pit)	1960-1973	The burial ground consists of two east-west-oriented trenches and one "V-shaped" pit. Most of the waste in this burial ground originated from the 313 and 333 Buildings. Miscellaneous contaminated equipment and hundreds of 114 L (30 gal) drums of zircaloy chips contaminated with moderate amounts of beryllium and uranium were buried in the trenches from 1960 to 1973.	EPA, 2001	2007	December 2008	160,920	6.2	Cs-137	0.082	/	/	0.025	/	/
											Eu-152	0.072 U	/	/	0.034 U	/	/
											Eu-154	0.114 U	/	/	0.049 U	/	/
											Eu-155	0.107 U	/	/	0.039 U	/	/
											Th-228	0.991			0.953		
											Th-230	2.20			1.29		
											Th-232	1.00	/	/	0.686	/	/
											U-233/234	9.23	/	/	3.46	/	/
											U-235	0.655	/	/	0.282	/	/
											U-238	7.90	/	/	2.94	/	/
											Sb	0.83			0.58		
											As	5.2			4.1		
											Ba	89.5			76.4		
											Be	0.45			0.40		
											Cd	0.19			0.19		
											Cr (total)	21.8			10.1		
											Co	10.2			9.3		
											Cu	27.6			16.1		
											Pb	30.8			9.7		
											Mn	364			335		
											Ni	70.4			20.6		
											V	80.4			75.0		
											Zn	56.2			50.3		
618-8	Burial Ground	300-FF-2	30 × 180	1954	The site is assumed to have been used for the disposal of uranium-contaminated solid waste from fuel fabrication facilities.	CVP-2006-00006	11/1/2004	1/31/2006	6,462	Not documented	U-233/234	1.19	/	/	1.04	/	/
											U-235	0.078	/	/	0.228 U	/	/
											U-238	1.1	/	/	0.643	/	/
											As	4.1	/	/	3.7	/	/
											Ba	97.6	/	/	93.30	/	/
											Cd	0.53 U	/	/	0.07 U	/	/
											Cr	12.4	/	/	11.8	/	/
											Pb	5.1	/	/	4.8	/	/
											Se	0.85	/	/	0.83	/	/
											Ag	1.1 U	/	/	0.15 U	/	/
											U (total)	3.28	/	/	1.7	/	/

Table B-1. Summary of 300 Area CERCLA Waste Sites

Site Code	Site Type	OU	Site Dimensions (m) OR m^2	Operation Dates	Site Description	Decision Documents	Remedial Action Start Date	Remedial Action End Date	Waste to ERDF (metric tons)	Maximum Remedial Action Depth (m)	Contaminant of Concern	Max Concentration (pCi/g, mg/kg)			95% UCL (pCi/g, mg/kg)		
												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
618-9	Burial Ground	300-FF-2	56 × 12	1950-1956	The site was a burial ground composed of a single trench. In 1991, this burial ground was excavated. Approximately 2,600 L (700 gal) of hexone, and 3,400 L (900 gal) of kerosene solvent were recovered from 120 drums in the trench's western end. Severely corroded drums were also found at the eastern end of the trench. Approximately 39.6 m^3 (1,400 ft^3) of debris was also found, including more than 80 empty drums, a wheelbarrow, scrap process equipment, construction debris, two breached bags of ammonium nitrate, unidentified white powders, and several lead bricks. Debris and soil were removed to the 200 Area Low-level Radioactive Burial Ground. Liquid wastes were sent to licensed offsite waste handling facilities.	DOE/RL-91-38; WSRF 98-075	2/28/1991	Not documented	Not documented	Not documented	Acetone	0.680	/	0.126	/		
											Chloroform	0.009 J	/	0.00388	/		
											1,1,2,2,-TCA	0.110	/	0.0294	/		
											TCA	0.920	/	0.156	/		
											HCE	17.000	/	5.81	/		
											HCBD	0.760	/	0.295	/		
											Phenanthrene	0.24 J	/	0.217	/		
											TCE	0.005	/	0.00253	/		
											Toluene	0.009	/	0.00257	/		
											BBP	2.700	/	1.26	/		
											Bis(2-ethylhexyl) phthalate	5.200	/	/	/		
											Methylene Chloride	2.300	/	0.322	/		
											Di-n-butyl phthalate	6.2 J	/	2.94	/		
											Al	8,570.0	/	3,081.98	/		
											Sb	4.0 U	/	/	/		
											As	11.6	/	/	/		
											Ba	90.2	/	56.9	/		
											Be	0.45 B	/	0.25	/		
											Ca	5710.0	/	3,648.13	/		
											Cd	0.84 U	/	/	/		
											Co	12.3	/	6.61	/		
											Cr	9.7	/	0.29	/		
											Cu	16.7	/	9.22	/		
											Cyanide	514.6 U	/	/	/		
											Fe	20,400.0	/	11,970.71	/		
											Hg	0.51	/	0.12	/		
											Mg	4,450.0	/	2,457.38	/		
											Mn	359.0	/	212.1	/		
											Ni	10.6	/	6.15	/		
											K	1,800.0	/	783.23	/		
											Ag	1.4 B	/	1.31	/		
											Na	201 BU	/	121.66	/		
											Pb	7.7	/	/	/		
											Se	1.0 U	/	/	/		
											Thallium	2.1 U	/	/	/		
											V	59.3	/	14.82	/		

Table B-1. Summary of 300 Area CERCLA Waste Sites

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												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
											Zn	66.9	/	29.67	/		
											Chloride	678.0	/	/	/		
											Fluoride	2.8 U	/	/	/		
											Nitrate	1670.0	/	265.71	/		
											Nitrite	1.4 U	/	/	/		
											Phosphate	43.4 J	/	/	/		
											Sulfate	983.0	/	/	/		
											K-40	16.6	/	/	/		
											Ra-226	2.36	/	/	/		
											Th-228	0.809	/	/	/		
											U (total)	3.18	/	/	/		
											U-234	0.48	/	/	/		
											U-235	0.71	/	/	/		
											U-238	0.48	/	/	/		
618-10	Burial Ground	300-FF-2	Trenches: 97 × 21 to 15 × 12	1954-1963	The site consists of 12 trenches and 94 vertical pipe units. The site contains a broad spectrum of low- to high-level dry wastes, primarily fission products and some TRU from the 300 Area. Low-level wastes are buried in trenches, and medium- to high-level beta/gamma wastes are mostly in the vertical pipe units. Some higher activity wastes were placed in concrete-shielded drums and disposed in the trenches. The site was surface stabilized with clean backfill material in 1983.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
618-11	UPR	300-FF-2	305 × 114 (fenced burial ground) 274 × 15 (trenches)	1962-1967	The site consists of three "V"-shaped trenches, two large dia. Caissons and 50 vertical pipe storage units. The burial ground received a variety of waste from the 300 Area operations. Low-level activity waste and large items were placed in the burial trenches. Some high activity waste liquid waste or plutonium contaminated liquid was placed inside barrels and sealed with concrete. The burial ground was surface stabilized with additional clean dirt and planted with wheat grass in 1983.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
618-12	Burial Ground	300-FF-1	122 × 61	1949-1964	Remediation of the Scraping Disposal Area was completed at the same time as the North Process Pond. The UCL area included the Scraping Disposal Area. Remediation activities were initiated in May 1998, and completed in June 1999. All contaminated soil (about 30,000 metric tons from the UCL Area) were disposed at ERDF; clean soil was stockpiled for backfill material. Fourteen verification samples were taken for the entire UCL Area.	BHI-01298	Cleaned up with 316-2. See BHI-01298	Cleaned up with 316-2. See BHI-01298	Cleaned up with 316-2. See BHI-01298	Cleaned up with 316-2. See BHI-01298	Cleaned up with 316-2. See BHI-01298	Cleaned up with 316-2. See BHI-01298	Cleaned up with 316-2. See BHI-01298	Cleaned up with 316-2. See BHI-01298	Cleaned up with 316-2. See BHI-01298	Cleaned up with 316-2. See BHI-01298	Cleaned up with 316-2. See BHI-01298
618-13	Burial Ground	300-FF-2	38 × 15	1950	The unit consists of a mound of soil. The site was originally a single-use disposal site for contaminated soil removed from the 303 Building perimeter in 1950. The mound of soil later served as a safety shield (blast shield) for drums of hexone stored in buildings on the west side of the berm before being buried in the 618-9 Burial Trench in 1954. This site received uranium contaminated topsoil removed from around the 303 Building area. Total activity buried in the site is not known.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
628-4	Burn Pit	300-FF-1	37 × 27	1962-1974	The unit was used mainly for burning paper, wood, paint cans, and other operations debris; however, some incidental radioactive materials may have also been burned.	CVP-2003-00001	1999	July 2000	5,635	5.7	Co-60	0.029 U	0.055	/	0.014	0.0224	/

Table B-1. Summary of 300 Area CERCLA Waste Sites

Site Code	Site Type	OU	Site Dimensions (m) OR m^2	Operation Dates	Site Description	Decision Documents	Remedial Action Start Date	Remedial Action End Date	Waste to ERDF (metric tons)	Maximum Remedial Action Depth (m)	Contaminant of Concern	Max Concentration (pCi/g, mg/kg)			95% UCL (pCi/g, mg/kg)		
												Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area	Shallow[a]/ ACL	Deep[b]/ BCL	UCL Area
UPR-600-15	UPR	300-FF-1	18 × 2	1979	The area is posted as "Underground Radioactive Materials." The release site was an area of soil outside the entrance to the 618-4 Burial Ground. The new fence was built in 1974; however, it was installed in a new location that left the release site outside of the burial ground boundaries. The previous fenced area included the release site. UPR-600-15 occurred in an area of soil running north and south of the west boundary fence of the 618-4 Burial Ground in the 600 Area.	Not documented	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
UPR-600-22	UPR	300-FF-2	138 × 92	Not documented	The site consists of a series of small parallel berms. Before 1972, the area was contaminated with particulate fallout from burial activities in the 618-11 Burial Grounds. The contaminated area was covered by scraping the affected ground into windrows. On 10/24/1972, a backhoe was used to cut across each windrow at a spacing of every 15 m (50 ft) to a depth of 15 cm (6 in.) below ground level. Radiological surveys were made of all soils removed and of the walls of each cut. No beta, gamma, or alpha radioactivity was detected above the normal background of 100 counts/min.	EPA, 2001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
N/A = Not Applicable; remedial actions not initiated and therefore, no information is available.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
301	Storage	300	300-FF-2	12.3 × 9.3 × 5.3	Demolished	1944	1993	The janitorial storage facility was an one-story building originally used to store metal to create new tools and to provide a location for machining these tools. In 1964, it was used to store various labor service tools, including equipment for removing snow and spreading salt on the roads, machinery for cleaning and drying venetian blinds, and an auxiliary fire tanker truck. In 1983, the building was used to store materials needed for the 384 Building.
304	Manufacturing Facility	300	300-FF-2	8 × 15	Demolished	1944	2006	The original 304 structure was a small concrete block structure that was built in 1944 and used to store sodium metal. It was dismantled and removed by 1946 (HAN-10970). A new 304 Building was completed in 1952. This was a sheet metal Butler building that rested on a concrete pad. The building housed nickel-plating pilot plant operations from the late 1950s to mid-1960s. From 1972 until 1986, beryllium/zircaloy-2 alloy and zircaloy-2 chips and fines were concreted in containers to reduce their ignitability. These containers were buried in the 200 Areas burial grounds. From 1975 to spring 1988, depleted uranium alloy chips and fines from PNNL were concreted into billets and returned to PNL for subsequent shipment to the 200 Areas burial grounds. In spring 1994, as the final treatment activity for the 304 Facility. Pyrophoric metal waste from dismantling of the 300 Area fuel processing equipment was concreted in drums to reduce ignitability.
305	Reactor	300	300-FF-2	67.6 × 26.5	Demolished	1943	2006	The 305 Test Pile is a two-story and high bay steel-framed concrete structure. The 305 BA Building (Boiler Annex) is located at the southwest corner of the building to provide steam. The 305 Building housed the 305 Test Pile AKA Hanford Test Reactor from 1943 to 1973 and later was used to support cold mechanical development for the Hot Cell Verification Facility (1979 to 1985). From 1985 to 2001, several cold mechanical test programs were conducted for testing Waste Receiving and Processing waste containers (1991), a flexible radiation detection system (1993), and several mechanical systems for the K-Basin Spent Fuel Storage Project (1993-1996) such as the fuel retrieval manipulator, sludge sucker, and gas-liquid samplers for K-Basin canisters.
307	Retention Basin	300	300-FF-2	8.5 × 5.2 × 2.7	Active	1953	December 2012 (Scheduled)	The 300 Area Retention Basins and Trenches consist of four open, epoxy-coated, concrete basins and two trenches. Each basin has a nominal 94,500 L (25,000 gal) capacity. The RPS ties into the basins on the north side, passing through a sample pit northwest of retention basin No. 1. The 300 Area Process Sewer and the RLWS drain from the south side of the basins. The trenches were backfilled in 1965 and are no longer visible. A large portion of the location has been paved and fenced. The site consisted of two trenches, each 180 m (600 ft) long, 9.1 m (30 ft) wide at the east end, tapering to 3.0 m (10 ft) wide at the west end. The depth varied from 3.7 m (12 ft) to 8.2 m (27 ft). The trenches ran in an east and west direction, approximately 6.1 m (20 ft) apart. Each contained a 13 cm (5 in.) vitrified clay pipe that ran the entire length of the unit.
308	Laboratory	300	300-FF-2	42.9 × 43.4 × 10.1	Inactive	1960	October 2011 (Scheduled)	The Fuels Development Laboratory (308 Building) was constructed in 1960 and was expanded several times between 1965 and 1980 (Steffen, 1996). From 1960 until 1968, it supported the PRTR mission to evaluate the use of plutonium as a nuclear fuel. Between 1968 and 1972, the 308 Building's primary mission changed from support for the PRTR and nuclear fuel research to support fuel fabrication for the FFTF reactor. In 1970, a fuel rod fabrication area, Room 154, was added to the north end of the 308 Building. During 1975 to1977, the 308A wing was added to the northeast corner of the 308 Building to support FFTF fuel bundle assembly including quality control measurements and testing. The quality inspection equipment included neutron radiography using a TRIGA reactor installed in Room 160 of the 308A Building. In 1979, a shipping and receiving annex was added on the south side of 308A; the annex had a bridge crane for handling fuel assembly shipping containers. The TRIGA reactor first went critical on 3/25/1975 and made its last power run on 5/4/1989. The enriched uranium fuel rods were removed in 1995 and plutonium oxide pellet fabrication activities were discontinued in 1986. Test pin and fuel assembly fabrication activities were discontinued in 1990. Special nuclear material removal was completed in May 1992, except for the TRIGA reactor fuel that was removed and shipped in 1995. The 308 Building deactivation work begun in 1986 was completed on 6/24/1996 (Steffen, 1996) with the transition of the 308 and 308A Buildings from Westinghouse Hanford Company to BHI for surveillance and maintenance pending removal and remedial action (BHI-01676).

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
309	Laboratory	300	300-FF-2	109.7 × 176.8	Inactive	1960	September 2012 (Scheduled; Potential Delay)	The 309 Buildings include the 309 Building PRTR containment vessel, its connected wings and annexes, the associated below-grade vaults (e.g., ion exchange, brine tank, waste storage, and exhaust air filters), and the main exhaust stack. The significant history for restoration of the 309 Buildings relates to the radiological contamination remaining from the operation of the PRTR from 1960 to 1968. A complete history of the PRTR and Plutonium Recycle Critical Facility is provided in WHC-MR-0388). The 309 Building is classified as a Type II facility. It is considered potentially contaminated by past PRTR operations and processes that used hazardous or radioactive materials, and represents a potential for a release to the environment during D4 activities. The facility history provided here relates to the planned demolition and restoration activities. In 9/29/1965, a serious (Type A) fuel failure accident occurred. Fission gases released during the rupture traveled through the helium system and into the HEPA filtration system for the process off-gases. The most serious contamination was within the primary and secondary coolant systems due to the fuel material released. Toward the end of the cool-down period, some contaminated light water was disposed to the ground east of the 309 Building parking lot, approximately beneath the present site of the 3763 Building (slab). In 1986 to 1987, a new space technology development program known as SP-100 was assigned to the 309 Building. The implementation of the SP-100 Ground Engineering System Test Facility was subsequently terminated by DOE in November 1993, which brought about the transition of the facility for deactivation. The Nuclear Facility Preliminary Hazard Assessment issued in 2001 states that the 309 Building remains a “low hazard radiological facility” following the completion of the transition and stabilization activities (WHC-SD-SP-PHA-001).
310	Process Unit/Plant	300	300-FF-2	143.3 × 91.4	Active	1994	September 2012 (Scheduled)	The 310 Building houses the TEDF, which treats and disposes of process sewer effluent from the 300 Area. Treatment includes chemical precipitation, selective ion exchange, and ultraviolet (UV)/peroxide oxidation to destroy organics and cyanide. After treatment, the effluent is disposed of at a submerged, single-port outfall in the Columbia River (Site 600-210). Chemicals used in this treatment include hydrogen peroxide, sodium hydroxide, sulfuric acid, ferric chloride, and ion exchange resins. Equipment located within the building includes chemical storage tanks for hydrogen peroxide, sodium hydroxide, sulfuric acid, and ferric chloride; pumps for transporting process effluent into a chemical mixing tank also located within the building; tanks to house a selective ion exchange resin system; and a UV/peroxide purification system.
311	Storage Tank	300	300-FF-2	3 × 3 × 3.2	Demolished	1944	2006	The 311 Tank Farm was designed to store product makeup sodium hydroxide, nitric acid, and methanol. Methanol management involved use of a still. Subsequently, multiple chlorinated hydrocarbons were substituted for methanol for degreasing billets and fuel rods. The alcohol tanks and still were removed. A waste acid tank was installed to reduce discharges to the chemical sewer. The 311 Tank Farm had two outdoor, concrete basins, which contained aboveground tanks for product sodium hydroxide and waste acid. Below the 311 Tank Farm, underground tanks were installed in 1944 to contain methanol.
312	Pump Station	300	300-FF-2	9.6 × 5.5 × 17.1	Inactive	1959	Scheduled Remediation Post-RCC Contract Date (Around 2027)	The 312 River Pump Station consisted of three different components, including a pump structure, an intake structure, and a concrete pad with electrical transformers. The pump structure was building located 16 m (52 ft) away from the intake structure, which was on the shore of the river. The pumphouse contained three pumps that extended to a depth of 17 m (56 ft). The intake structure was located on the shore of the Columbia River and extended 11.3 m (37 ft) into the river. A “trash rack” extended all the way to the bottom of the river to prevent large objects from entering the pump system. An underground tunnel connected the bottom of the intake structure to the pump structure. A transformer pad was located adjacent to the 312 Pump Structure Building.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
313	Fabrication Shop	300	300-FF-2	55.6 × 148.1	Demolished	1943	2005	The original 313 Building was constructed in 1943 to support the reactor operations in the 100 Areas. The building was used to machine fuel rods into slugs or cores that were then jacketed or canned, which involved the use of several hazardous chemicals, including acenaphthene, carbon tetrachloride, TCE, phosphoric acid, methanol, sodium hydroxide, sodium nitrate and acetone. In 1954, the fuel canning process was switched to a different process called the "lead-dip" process, which introduced lead into the 313 Building waste stream. Airborne contamination readings within and near the 313 Building were frequently high and uranium, lead, cadmium, bismuth, aluminum, barium, and other heavy metals accumulated in the soils and facilities of the 300 Area during the years 1944 to 1971. The WATS, a RCRA permitted waste treatment system, was located in the southeast end of the 313 Building. The WATS has been RCRA clean-closed.
314	Manufacturing Facility	300	300-FF-2	60.8 × 27.6 × 12.2	Demolished	1943	2006	The 314 Building has supported the fuel fabrication process as well as used as a R&D laboratory. The fuel fabrication activities included autoclave testing of canned fuel elements and uranium scrap recovery. The 314B Building was added in the early 1960s to support the R&D efforts, which included corrosion testing and development of mechanical equipment such as reactor fuel charging machines and reactor auxiliary equipment, and equipment mock-ups. The R&D work during the late 1980s and early 1990s included: waste vitrification experiments; stress corrosion cracking testing for naval reactor components using the autoclaves; crushing of empty napalm containers; welding remedies using the high-pressure high-temperature pipe test loop; N Reactor NDE work; corrosion testing of depleted uranium penetrators for the U.S. Army; cruise missile NDE; surface coating research using plasma coatings; and metal forming using a rolling mill.
315	Process Unit/Plant	300	300-FF-2	14.9 × 37.8	Demolished	1960	2010	The 315 Building was constructed in 1960 to support the Plutonium Test Reactor project by treating raw river water. In 1975, the 315 Building was modified to produce potable water. The size of the building was increased, and new equipment was added for introducing chlorine and other chemicals into the water. The 315 Complex provided potable water for the entire 300 Area until it was shut down in 1998. The 315 Water Filter Plant was a concrete building and included three sedimentation basins, a clearwell storage area, and a small laboratory.
318	Laboratory	300	300-FF-2	4.9 × 15.2	Inactive	1967	Scheduled Remediation Post-RCC Contract Date (Around 2027)	The main 318 Building was constructed during 1966 to 1967 to house the HTLTR, a reactor designed to test very high-temperature fuel performance in gas-cooled reactors. The 318 Building also contained a three-story steel paneled service wing west of the reactor enclosure. Its roof was metal framed and covered with built-up roofing asphalt. The reactor itself, along with its control room computer, was removed between 1978 and 1982. The 318 Building has been used since that time as a PNL site services facility to house offices, computers, and work involving the calibration of dosimeters and survey instruments. An ancillary detector building designated as 318-A was located approximately 10.4 m (34 ft) south of the reactor enclosure of the 318 Building. More recently, the 318-A Building was used for storage and laboratory space. In 1982, after the HTLTR had ceased operations and been removed, the 318 Building received a one-story prefabricated steel frame addition on the south side. This annex was erected on concrete footings and slab and had an insulated metal roof.
320	Laboratory	300	300-FF-2	43.9 × 25.6	Inactive	1966	February 2014 (Scheduled)	The 320 Building's original mission was to house analytical chemistry services and plant support for work involving low-level and nonradioactive samples. The original work performed in the 320 Building included gamma ray spectrographic analysis, physical measurements with instruments, and various types of radiochemical separations processes similar to those performed in the 325 Building but involving samples with low levels of radioactivity. Among these processes were solvent extraction, ion exchange, carrier precipitation, and electrode position. Some analytical support also was provided to environmental monitoring and bioassay samples, again on materials with lower radioactivity levels than those analyzed in the 329 Building. R&D included radiometric techniques, new mass spectrometric techniques, combined (simultaneous) atomic absorption/mass spectrometric analysis, and laser-based spectrometric techniques.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
321	Laboratory	300	300-FF-2	11.0 × 14.6	Demolished	1944	2009	The 321 Separation Building was constructed as a pilot scale plant for testing chemical "process improvements" using unirradiated or low activity substances. It was a windowless two-story facility with a reinforced concrete frame, and concrete block exterior and interior walls. Pilot scale process tests of the bismuth phosphate (uranium-plutonium separation) process were performed from January 1945 to 7/7/1945. In August 1945, the bismuth phosphate process equipment was cleaned out and placed in standby condition. In January and February 1947, the bismuth phosphate process equipment was removed, the associated piping and facilities were decontaminated, and, except for the hot lab in the north wing, the 321 Building was released (plutonium-free) for "cold" separations and separations waste management pilot plant support activities. The 321 Building (except for the small hot lab on the north side) was operated as a "cold" separations pilot plant facility after the 1947 cleanout. From 1944 through 1967, the chemicals used were uranium, thorium, and the chemicals associated with the Hanford Site chemical separations processes and chemical separations waste management processes. From 1968 until it was shutdown in 1988, the 321 Building was used as a hydromechanical test facility in support of the FFTF Project.
323	Laboratory	300	300-FF-2	12.2 × 24.4 × 3.7	Demolished	1960	2008	The 323 (321-A) Building was brought to the 300 Area to be an annex for 321 Building chemical testing operations. However, after the 321 Building lost its waste vitrification mission in 1968, the 321-A Building was converted to the Metals Creep Laboratory. As such, the facility conducted tensile tests on metal samples of FFTF components, including the fuel subassembly, reactor vessel, and primary system weldments. For this work, the building underwent modifications and equipment upgrades throughout the 1970s. It was later renumbered the 323 Building and transferred to PNL in 1987.
324	Laboratory	300	300-FF-2	62.5 × 71.6 × 13.7	Inactive	1965	September 2013 (Scheduled; Potential Delay)	Major construction of the 324 Building in the 300 Area of the Hanford Site was completed in 1965. Significant additions to the building since the original construction include the high-bay, shop, and office additions. The 324 Building contains laboratories, hot cells, support facilities, and office space designed to pursue technical studies that range from laboratory scale to pilot-plant scale. These studies involved the use of materials having levels of radioactivity from natural background to full process levels (i.e., spent nuclear fuel and high-level tank waste). The 324 Complex was operated by PNNL until 1996, when the facility was transferred to B&W Hanford Company for interim operation and eventual stabilization and deactivation in preparation for building decommissioning. PNNL continued limited operations in the 324 Complex until October 1998.
325	Laboratory	300	300-FF-2	Too many dimensions	Active	1953	Scheduled Remediation Post-RCC Contract Date (Around 2027)	The 325 Radiochemistry Building, completed in 1953, was built to safely house and handle multi-curie level chemical development work with high activity substances. During 1959 to 1960, a large addition known as the high-level radiochemistry wing was constructed, making the overall building the largest among the Hanford Site's laboratories. The entire ventilation system was engineered in a reverse flow, which was a state-of-the-art concept in the 1950s. The original 325 Building contained eight hot cells and three larger hot cells were added from 1959 to 1960. The central RLWS connection was located on the northeast side of the building. Additionally, a transfer line between the 324 and 325 Buildings to facilitate waste vitrification work was installed in 1971. Work in the 325 Building, especially in the high-level radiochemistry addition, was conducted on highly radioactive materials. Plutonium Reclamation Facility process development introduced dibutyl butyl phosphonate, one of the most corrosive chemicals ever used on the Hanford Site, into 325 Building waste streams. Additionally, cell decontamination chemicals and reagents including nitric acid, ethanol, acetone, many commercial products of the Turco Corporation, and other cleansers were blended into the high activity waste streams. Over the years, there have been numerous liquid and airborne contamination spreads outside of designated radiation zones inside the 325 Building. In addition to events involving contamination spreads within the 325 Building, some contamination releases to the environment over the years have resulted from facility operations in the form of stack emissions. Other environmental releases from the 325 Building have occurred primarily in the form of leaks to the soil from the old RLWS pipes and from other drains, pipes, and cell and basement encasements.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
326	Laboratory	300	300-FF-2	57.9 × 54.9 × 11.6	Active	1953	June 2014 (Scheduled)	The 326 Building was constructed to support the study of reactor components and fuel elements The earliest and most intense radioactive work in the 326 Building was the operation of exponential piles in the basement beginning in 1953 to 1954. However, pile operations such as 305 and 305-B Building activities, produced little environmental contamination. Wastes generated by metallurgical work in the 326 Building consisted primarily of chemicals and heavy metals. As in other HW buildings, work with uranium and with other fuel and jacketing materials was conducted with few precautions in the early years. The 326 Building was connected to the RLWS network upon its original construction, and a diverter line allowing liquid wastes from the 329 Building to flow through the 326 RLWS connection was installed in 1968. In general, however, wastes and contamination in and around this structure are less serious than those at most 300 Area Manhattan Project buildings or at the 325 and 327 Buildings.
327	Laboratory	300	300-FF-2	65.5 × 42.7 × 9.8	Demolished	1953	2010	The 327 Building opened in 1953 to house the examining and testing of irradiated materials, particularly fuel elements and fuel cladding materials. The very nature of the work performed in the 327 Building involved and generated extremely high activity wastes. Irradiated materials, including ruptured or failed fuel rods containing plutonium and fresh fission products, were examined while they were “green” (i.e., when they had experienced very little decay or stabilization time). The irradiated fines generated by this work were swept up and treated as solid waste, but powdery dusts left behind clogged air filters, sifted through the canyon, or were flushed into the RLWS as liquid wastes. There they collected in “hot spots” in cell drains, pipes, and around the weld joints where they were periodically discharged using strong chemicals and by mildly shaking the RLWS line with rivet guns. Intense waste and contamination problems developed in the 327 Building almost as soon as it opened, especially in connection with high airborne radiation readings and with sample and waste transfers. Airborne contamination from irradiated uranium and graphite fines was discharged outside of the 327 Building. Some of the most severe instances of contamination spreads within the 327 Building occurred as the result of the transfer of radioactive materials and of wastes in and out of hot cells and radioactive materials storage basins. Cell, drain, and waste piping leaks also accounted for some of the contamination events and waste losses to the environment that occurred in 327 Building history. In some cases, explosions and/or fires spread contamination in and around the 327 Building.
328	Maintenance Shop	300	300-FF-2	3,644.4 m^2	Demolished	1952	2007	The 328 Engineering Services and Safety Shop, called the Mechanical Development Building when it was constructed in 1952, was built to contain craft, equipment, and fabrication services for the 300 Area laboratories. The building was never connected to the RLWS, and there are virtually no known instances of radioactive contamination. On a few occasions, contaminated pieces of equipment found their way into the facility from other structures, and on two occasions, radioactive contamination incidents in other buildings affected the 328 Building. The 328 Building was a “cold” facility not equipped or permitted to contain radioactive materials. It housed a main metal and machine shop, two mock-up shops, a drafting room, as well as welding, paint, carpentry, and glass-blowing shops.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
329	Laboratory	300	300-FF-2	66.3 × 37.0 × 10.4	Active	1953	June 2014 (Scheduled)	The 329 Biophysics Laboratory was built in 1952 to 1953 to support the pioneering HW environmental and bioassay programs. The primary, original mission of the 329 Building was to house the preparation and counting of radioactivity levels in samples taken of the air, vegetation, soil, wildlife, river and well water, and various types of bioassay samples. Other building functions included the development of new sample counting procedures and methods, the invention and improvement of radiation monitoring instruments, and the application of industrial hygiene techniques from other industries to the Hanford Site's health physics needs. This bolted steel framework facility had no basement and only part of the building had a second story. Wastes and contamination in the 329 Building resulted both from the chemicals used to separate various isotopes before analysis and counting could be done and from occasional spreads of fission product activity from contaminated samples that were brought in from the field. Acids that were not neutralized sometimes damaged the facility's RLWS and process pipes on several occasions. The building was connected to the RPS or "diverter" system, and this system was activated in several incidents when radioactive substances were disposed to process pipes. The RLWS line from the 329 Building was routed through a connection in the 326 Building in 1968, and this line needed to be replaced because of corrosion in 1986. At that time, strict procedures for use of 329 Building drains leading to the RLWS were instituted. On numerous occasions during 1988 to 1990, instrument malfunctions and improper disposals resulted in the deposition of hazardous and radioactive components in the RPS line. In February 1989, radioactive wastewater backed up through a drain and flooded the 329 Building basement. Today, radioactive waste disposal from this structure requires the permission of a supervisor to unlock the specified sink.
331	Laboratory	300	300-FF-2	38.7 × 87.5	Active	1970	Scheduled Remediation Post-RCC Contract Date (Around 2027)	The functions of the 331 Building and its many ancillary facilities always have involved biological and botanical research. The 331 Life Sciences Building, constructed in 1970 to replace the old HW Biology Laboratory (108-F Building), is a three-part structure. Animal wastes were the most prominent wastes, in terms of volume, generated by 331 Complex operations. Originally, liquid animal wastes were disposed to a large, unlined pit located along the Columbia River just south of the 331 Building. All radioactive solid animal wastes from the 331 Complex also were transported to the 100-F Area trenches regularly. When the 331-D Animal Waste Treatment Facility was constructed during 1973 and 1974, use of the 331 Complex waste pit along the Columbia River was discontinued. Nonradioactive solid animal wastes (primarily animal carcasses) originally were incinerated outdoors in a roofed, locked enclosure just east of the 331 Building until a modern incinerator was installed in the 331-J Building about 1988. Contaminated animal carcasses were considered solid radioactive waste and were placed in barrels and buried in 200 Area burial grounds. Chemical and radioactive laboratory wastes, along with fish tank waters, constituted the other categories of wastes generated in noteworthy amounts by 331 Complex operations. The 331 Building was connected to the 300 Area sanitary, process and RPS sewers, and the ancillary buildings within the complex were connected only to the sanitary and process sewers. Some of the smaller, early structures, including the 331-B Building, also had French drains for waste drainage into the ground. Radioactive wastes were removed via containers and casks. Laboratory operations included the use of several radiation sources (radionuclides in various forms) used for animal exposure. Laboratory chemicals and cleansers included a standard array of acids, caustics, reagents, alcohols, germicidal soaps, commercial bleaches, and acetone. There have been several instances of the loss of control of radioactive and chemical materials within the 331 Building Complex.
332	Laboratory	300	300-FF-2	6.1 × 6.1	Demolished	1984	2009	The 332 Building is a pre-engineered metal building on a 15 cm (6 in.) slab with footings. The 332 Building was temporarily used to store nonradioactive HW. It began to operate on 3/1/1984 as a less than 90 day storage area. A Part A Permit Application was filed in 1988 to allow for longer storage of waste. However, the 305B Building was also permitted for long-term storage and the 332 Building was never used for this purpose. It was closed on 4/21/1997 (WIDS 332SF) as a less than 90 day storage area. Its final mission was a testing facility for U.S. Department of Transportation shipping packages. Currently, the building is inactive per PNL, and the facility is a closed out WIDS site with Ecology (332SF). Electrical service to the building has been disconnected.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
333	Fabrication Shop	300	300-FF-2	13.1 × 3.0 × 2.7	Demolished	1960	2006	The 333 Building was built during 1959 and 1960 to manufacture fuel elements for the N Reactor using the co-extrusion process. The 333 Building was a large steel frame building with double metal insulated panel exterior walls. The foundation and floors are concrete. There was a tank farm located on the west side of the 333 Building. The tank farm contained three cylindrical tanks that stand upright within a concrete containment basin. The containment basin is attached to the outside of the 333 Building. In 1973, the WATS began operating to treat waste acids from the 333 Building operations. The 300 Area WATS components of the 333 Building were tanks 7 and 11, and a 5.1 cm (2 in.) PVC drain piping from these tanks and from non-WATS tanks that drained waste acid to the 334-A Building storage tanks.
334	Monitoring Station	300	300-FF-2	4.6 × 6.1	Demolished	1960	2005	The 334 Building and 334TF were built in 1960 to support fuel fabrications operations at the 333 N Fuels Manufacturing Building (333 Building). The 334 Building housed control instrumentation for the 333 Buildings acid system and instrumentation for volume measurements of the tanks in the 334TF. The building also was used for storage of minor amounts of chemicals used in the fuels fabrication process. The 334TF consisted of four aboveground 22,710 L (6,000 gal) tanks. The tanks are numbered, south to north, 1, 2, 3, and 4. The tanks were used for the storage of nitric and sulfuric acid that was used in the fuel fabrication process. In 1989, the WATS became a RCRA TSD facility. Partial closure of the non-soil portions of the 300 Area WATS started in the late 1990s. The WATS portion of the 334TF was clean closed as part of the 300 Area WATS partial closure in December 2001.
335	Laboratory	300	300-FF-2	30.5 × 18.3 × 7.3	Demolished	1968	2009	The 335 Building was known initially as the FRTE Facility. Almost immediately, a concrete block addition 6.1 × 7.4 × 3.0 m (20 × 24.3 × 10 ft) was built to house a change room, giving the 335 Building a total area of 707 m^2 (7,610 ft^2). 335-A was built in 1971 to house the TTL, which also stretched into the 336 Building through inter-connecting piping. This loop was used primarily to test and qualify small valves for use in FFTF. A 3,180 L (840 gal) sodium blowdown tank was located in a pit area within the building. The control panel for the TTL loop was housed in the 335 Building. In 1977, the TTL was shut down, and the 335-A Building has since been removed.
336	Laboratory	300	300-FF-2	15.2 × 15.2 × 19.8	Demolished	1969	2010	The 336 Building, completed in 1969, was originally constructed to house experimental equipment for the study of the properties of sodium. It was known as the Core Segment Development Facility and supported FFTF developmental studies. The sodium test loops were deactivated in 1977 and finally removed from 1983 to 1984. The building was transferred to PNNL in 1986. The building has been used most recently for basic research related to multiphase flow phenomena and to experimentally address issues related to the Hanford Site such as waste retrieval, transport, and disposal using non-radioactive simulates. Facility equipment and systems include numerous tanks (about 10) with capacities to 45,400 L (11,993 gal). A 7.6 cm (3 in.) diameter pipe slurry test loop is installed. There was a small laboratory built in the early 1990s to support the high bay testing. It houses state-of-the-art flow measuring instruments.
337	Laboratory	300	300-FF-2	50.3 × 15.2 × 15.4	Demolished	1970	2010	The 337, 337B, and 3718M Buildings were constructed in the early 1970s for Project BAP-048, the HTSF. These buildings provided space and facilities for engineering studies in support of FFTF and the LMFBR program at the Hanford Site.
338	Maintenance Shop	300	300-FF-2	24.4 × 57.9 × 9.1	Inactive	1955	August 2012 (Scheduled)	The 338 Building provided space to receive, mock up, test, and store components and certified materials for use in the HTSF. An equipment development, fabrication and sodium maintenance shop also was included. The 338 Building served in its initial functions of varied LMFBR equipment support activities through the early 1980s. In 1978, a Remote Maintenance Evaluation Facility was emplaced in the 338 Building. By 1981, FFTF developmental work had diminished greatly, and the 338 Building was converted that year to house the Secured Automated Fabrication Cold Test Facility, a nonradioactive demonstration project for oxide fuel processing line operations for the FMEF. In 1988, the facility was converted to a chemical and hazardous materials storage area. Today, the 338 Building is known as the Maintenance Building and continues to serve as a less than 0 day storage facility for hazardous materials.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
340	Process Unit/Plant	300	300-FF-2	12.2 × 13.0	Inactive	1953	July 2011 (Scheduled; Potential Delay)	Completed in 1953, the 340 Building, along with the initial RLWS piping system, the 307 Basins, and the RPS piping system, represented an attempt to deal with radioactive effluents from several new laboratories in a modern, controlled manner. The original 340 Building contained a sampling room with sample wells and an air compressor for instrument air and an operating gallery with a caustic tank and control panels for operating flows to and from two stainless steel tanks located below the building. Equipped with agitators, valves, and transfer pumps, these tanks were built to receive and sample liquid wastes from 300 Area laboratories. Radioactive wastes would then be taken by tanker truck to the 200 Area disposal facilities (usually cribs), and nonradioactive wastes could be disposed to the 307 Trenches. The tanks in the 340 Complex were fed by the RLWS. In 1976, a comprehensive leak test of the RLWS network was conducted. The results of these tests led to a decision to replace the entire RLWS piping network with double-walled stainless steel pipes, a leak detection system, many new valve boxes, and other system parts. Many segments of contaminated dirt throughout the RLWS piping network were removed at that time. However, the old RLWS pipes themselves were abandoned in place, and portions of soil contaminated by their leaks remain.
342	Sump	300	300-FF-2	3.7 × 5.7	Active	1993	Scheduled Remediation Post-RCC Contract Date (2027)	The 342 Site included several different components and was designed for pumping wastewater from the 300 Area to the 310 TEDF. The 342 structure itself was an underground sump. A set of three pumps were located at the bottom of the sump, near the southern wall of the structure. The 342-A Building was designed as a Sump Control Room and was located directly over the 342 Collection Sump. Equipment originally located within the structure included a sampling pump, control panel, and transfer switch. A pump control cabinet and junction box were located against the exterior of the building. The 342-B facility was a transformer pad that was located approximately 3 m (10 ft) north of the 342 Collection Sump. The concrete pad housed a single 75-kVA transformer along with a power vault. The 342-C facility was a generator pad that was located about 0.5 m (1.5 ft) north of the 342 Collection Sump. It included a generator set inside a protective casing and a 1,135 L (300 gal) dike tank for storing fuel.
350	Maintenance Shop	300	300-FF-2	24.4 × 62.2	Active	1981	Scheduled Remediation Post-RCC Contract Date (Around 2027)	The 350 Complex served as the central craft shop for the 300 Area, with offices for supervisory and support personnel. The main 350 Building contained shop areas for plastics, carpentry, electrical/instrument, machine, welding, grinding, and pipefitting/millwright work. As of 1984, approximately 70 personnel worked either in or out of the facility providing service and craft functions. The 350-A Building provided space for spray-painting and sandblasting. The 350-B Building was used to store miscellaneous equipment and supplies. The 350-C Building functioned as a storage building for lumber used by the various shops. The 350-D Building served as a storage location for hazardous chemicals, primarily oil.
361	Monitoring Station	300	300-FF-2	3.7 × 10.1	Active	1999	Scheduled Remediation Post-RCC Contract Date (Around 2027)	The 361 Building was used in support of *Comprehensive Nuclear Test Ban Treaty* studies. The 361 Building was used for R&D of the air monitoring equipment as well as a training facility for personnel who used these systems worldwide. The 361 Building was constructed of prefabricated concrete. Two small stacks were located on the top of the building.
363	Loading Dock	300	300-FF-2	7 × 2.44 × 1.83	Demolished	1944	1953	This structure consisted of a 1.8 m (6 ft) deep reinforced concrete wall with wing walls. The 363 structure was presumably used to transfer cargo onto and off trucks for transportation. The 303-D facility was later expanded into the 3707-D Building, which extends over this site.
366	Storage Tank	300	300-FF-2	8 × 64 × 3.5	Demolished	1964	2001	The 366 Fuel Oil Bunker consisted a small shack above-grade along with four fuel storage tanks (bunkers) below-grade. The total capacity of the tanks was 1,678,000 L (444,000 gal). The above-ground shack contained pumping equipment. The four concrete bunkers (USTs) were removed during summer 2001. Some low level radioactivity was detected but the source of radioactive contamination is unknown. After the bunker tanks were removed, the soil contaminated with hydrocarbons was excavated to a depth of 4.6 m (15 ft) below grade level. This soil was removed from the site and staged. Visual observations confirmed hydrocarbon contamination of the soil at 4.6 m (15 ft) below grade level.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
377	Laboratory	300	300-FF-2	12.2 × 10.9	Demolished	1981	2006	The 377 Building was known as the Steam Generator Examination Facility and the GEL. The 377 Building was comprised of two distinct sections, north and south, with a common wall. The building was designed to conduct nondestructive testing, inspection, examination, and destructive testing of a steam generator from a commercial nuclear power plant. The examination activities took place between 1983 and 1987, and the building was decontaminated in 1990. It was then used as a characterization laboratory for the testing of the Hanford Site soil samples until 1995. The 377 Building had no drain connections to the process sewer. Any liquid wastes or solid wastes generated by the GEL were collected in appropriate containers and shipped as need. The building's only pipeline connections were for sanitary water and the sanitary sewer. The building also had the following piping systems: bottle-fed argon and nitrogen, breathing air, vacuum, and service/instrument air system.
382	Pump Station	300	300-FF-2	15.5 × 12.5	Active	1943	March 2012 (Scheduled)	The 382 Facility originally was designed to provide treated, potable water for use in the 300 Area. The area water supply originated from wells near the 300 Area. Water was pumped from the wells and treated with chlorine before being used throughout the 300 Area. Later on it was used to store and distribute sanitary water as a backup from the normal 300 Area supply, which was provided by the 315 Facility. It consisted of the following: 382 Pump Station , 382-A Ground Tank, 382-B Ground Tank, 382-B Fire Pump Station, 382-C Ground Tank, 382-D Ground Tank, and 382 Sand Separator.
383	Storage Tank	300	300-FF-2	Not recorded	To Be Constructed	2008	N/A	This facility is scheduled to be constructed on the north side of the 325 Building.
384	Process Unit/Plant	300	300-FF-2	63.4 × 8.8	Demolished	1943	2008	The original construction of the 384 Building consisted of steel framing, reinforced concrete, and concrete block. The 384 Building's original construction consisted of steel framing, reinforced concrete, and concrete block. The original equipment configuration consisted of two 300-hp cross-drum boilers with horizontal stationary grates. Water softening equipment was located in the west end of the building, and a wooden tank with treated water for the boilers was located outside just west of this equipment. The east ground floor portion of the 384 Building included three coal-fired boilers and two oil-fired boilers; the south front of the building contains offices, change rooms, control room, electrical switchgear room, battery room, and master control consoles; the southwest corner of the building includes a chemical lab, safety shower, chemical storage, and air compressor. The basement contained coal transport equipment, ash removal equipment/structures, and condensate equipment.
385	Pump Station	300	300-FF-2	Not recorded	To Be Constructed	Not Documented	N/A	This facility is scheduled to be constructed northwest of the 318 Building.
3106	Storage Tank	300	300-FF-2	Not recorded	Removed	Not Documented	N/A	The 3106 Facility consisted of two large helium tanks, apparently similar to those used in the 100 Areas as the 110 buildings. The 3106 facility was located just east of the 305 Building, south of the 351 substation. An aerial photograph confirms the existence of this facility.
3128	Storage	300	300-FF-2	6.1 × 3.1 × 2.7	Demolished	1977	2009	The 3128 Building was a storage building located near the 328 Building. The facility was constructed on a concrete slab with an asphalt ramp leading up to the entrance. The walls were made of concrete block with metal siding on the exterior. The roof of the building was metal and slightly slanted down toward the back. The 3128 Building provided storage space for gas bottles.
3220	Office	300	300-FF-2	33.5 × 15.8 × 5.9	Active	1992	Scheduled Remediation Post-RCC Contract Date (Around 2027)	The 3220 Network Management Center Building was made of concrete. It contained office space, storage space, an equipment room, a conference room, a break room, and restroom facilities. Five HVAC units were located on the east side of the building, while a concrete generator pad was located on the west side. The roof was split into two levels and was composed of 1.5 cm (0.6 in.) plywood decking with a built-up membrane roof cover over open web trusses on 61 cm (24 in.) centers. The 3220 Building was used to house equipment necessary for modern telephone communications. As of 1999, it provided telephone service not only to the 300 Area, but also to HAMMER, the Hanford Patrol Training Academy, SIGMA 5, 345 Hills, the Applied Process Engineering Laboratory building, and the 100 DR Area using fiber-optic digital loop carriers.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
3221	Office	300	300-FF-2	81.19 m^2	Demolished	Not Documented	2002	The 3221 Facility supported a sandblasting operation in the 300 Area.
3222	Storage	300	300-FF-2	81 m^2	Demolished	Not Documented	2002	The 3222 Building was used for storage.
3223	Storage	300	300-FF-2	30.2 m^2	Demolished	Not Documented	2002	The 3223 Building was used for storage.
3224	Storage	300	300-FF-2	29.9 m^2	Demolished	Not Documented	2002	The 3224 Building was used for storage.
3225	Storage	300	300-FF-2	9.1 × 1.8	Demolished	Not Documented	2005	The 3225 Building open yard bottle dock was used to store compressed gas cylinders. The structure consists of a steel frame on individual concrete footings with a steel floor and a metal roof. The storage bays for the gas cylinders are separated by either concrete block walls or metal walls. Bays are not fully enclosed and are open to the weather.
3228	Office	300	300-FF-2	19.6 m^2	Demolished	1975	2002	The 3228 Building was a wooden shed that was constructed in the mid-1970s (IOM 089302). The 3228 Building was used as a lunchroom.
3229	Storage	300	300-FF-2	29.0 m^2	Demolished	1978	2004	The 3229 Building was a corrugated steel shed and was constructed in the late 1970s. As of 2000, it contained five cabinets for flammable materials and a connex, all of which belonged to FH. The building included a ceiling-mounted heater. The building was apparently used for storage of chemicals and equipment.
3231	Maintenance Shop	300	300-FF-2	133.8 m^2	Demolished	Not Documented	2004	The 3231 Building contained a ceiling-mounted electric heater and had PCB lighting. The building included storage space for electrical supplies and tools. In 2000, the building had connexes on each side. The building was used to house an electrician shop.
3232	Storage	300	300-FF-2	125.9 m^2	Demolished	Not Documented	2004	The 3232 Building contained storage space for piping, hand tools, and an air compressor. The building also had PCB lighting. In 2000, four connexes were located near the building.
3234	Storage	300	300-FF-2	10.3 m^2	Demolished	Not Documented	2004	The 3234 Building was a fiberglass shack used for storage in the northwestern portion of the 300 Area. In 2000, it contained five storage containers for flammable materials such as gasoline and roof cement. The 3234 Building was used to store various materials, including flammable chemicals.
3235	Storage	300	300-FF-2	Not recorded	Demolished	Not Documented	Not Documented	The 3235 Building was used for paint storage. The complete documentation and history is not available.
3507	Control Structure	300	300-FF-2	3.7 × 3.7	Active	1982	Scheduled Remediation Post-RCC Contract Date (Around 2027)	The 3507 Building houses microwave communications equipment and was located directly underneath the large microwave tower. Its construction consists of a metal building, painted concrete floor, no windows, transite siding, and felt roof. Equipment within the building included a UPS, DC charger, battery, and various electrical and communications equipment. The 3507 Building was part of the new microwave communication system that was installed in the early 1980s. It replaced an earlier 30.5 m (100 ft) tower that had been located near the 3709-A Building.
3605	Control Structure	300	300-FF-2	4.1 × 4.1 × 6.7	Demolished	1944	Not Documented	The purpose of the 3605 Guard Towers was to observe the fence boundaries for attempts at sabotage and for fires. Each 3605 Building consisted of an observation room mounted on a four-post wood frame tower. Access to the observation room was obtained by a single- or double-flight open wooden stairway. Heating was provided by an electric space heater in all tower rooms.
3607	Pump Station	300	300-FF-2	A: 2.13 × 1.52 B: 12.19 × 4.88	Active	1944	Not Documented	3607-A and 3607-B were constructed in 1974 to support the 3607 Sanitary Sewer Disposal System that had been in service since 1944. The 3607 Septic System was designed to treat and dispose of sanitary wastewater from the 300 Area. The 3607-A Chlorinator Station consisted of a concrete pad near a retention basin. Presumably, the structure supported a pumping system that transferred chlorine from 3607-B and into the retention basin. The 3607-B facility was designed for storing chlorine for use in water treatment.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
3614	Monitoring Station	300	300-FF-2	2 × 2 × 3.45	Demolished	1944	Not Documented	The 3614 Building contained equipment to monitor the air quality in the 300 Area. The 3614 Building contained one pedestrian door and no windows, with heating provided by an electric space heater.
3621	Electrical Substation	300	300-FF-2	A and C: 1.52 × 2.9 × 3.4 B: 3 × 4.57 × 3.4	Demolished	1944	Not Documented	The 3621 Emergency Generators were designed to house an emergency, gasoline-motor-driven, electric generator set. These sets were provided for buildings requiring continuous lighting service and were equipped for automatic starting in case of power failure. 3621-A was associated with the 3706 Building, 3621-B supported 3719, and 3621-C supported 3707-A. Each building was provided with one single, outside pedestrian door and one single-frame, double-hung window. The fuel storage tank for the gasoline engine was placed outside of the building on concrete saddles of sufficient height to provide a gravity feed. Two facilities known as 3621-B and 3621-C were built near the 384 Building in the 1960s, which appear to be different from the structures described here. The names given to those structures would seem to imply that the original 3621-B and 3621-C Buildings had been removed by the 1960s, while the 3621-A structure may have still existed.
3622	Control Structure	300	300-FF-2	Not Documented	Demolished	Not Documented	Not Documented	This facility was located on a slight hill, providing an ideal viewpoint for a number of the 300 Area buildings, especially PRTR. It was likely used for public relations for visitors to the site during the 1960s and 1970s.
3701	Office	300	300-FF-2	12.5 × 7 × 7	Demolished	1943	Not Documented	The 3701 Building originally served as the sole entry point to the 300 Area. The storeroom within the building was being used as a darkroom in 1945. The original 3701 Gate House was a two-story building. The ground floor consisted of two rooms, a guardroom, and a clock alley. The second floor contained a laboratory, two storage rooms, an office, a lavatory, and a hallway, and was accessible from an outside wooden stairway and platform that rested on a concrete base. A small equipment shed was attached to one side of the building and originally was used to house an air compressor and air conditioning unit.
3702	Office	300	300-FF-2	65.84 × 12.19 × 6.1	Demolished	1948	1996	The 3702 Building was used as an office building. It was a one-story rectangular building with a wooden frame and an asphalt shingle roof, asbestos shakes on wooden drop siding, and steel frame casement windows with shade screens. The floor was finished with asphalt tile. A concrete block wall supported the perimeter of the building.
3703	Office	300	300-FF-2	12.2 × 84.1	Demolished	1948	1996	The 3703 Facility provided about 35 offices, a drafting room, a duplicating center, and restrooms. It was a wood frame structure set on a concrete block foundation. The floor was wood covered with asphalt tile, while the roof consisted of roll tarpaper.
3704	Office	300	300-FF-2	132.86 m^2	Demolished	1944	2004	The 3704 Building was originally the TC-36 Division Engineers' Office during the initial HEW construction work. The facility was retained as a permanent building and served as the area supervisor's office. The construction of this facility is unknown. Based on similar buildings in other areas, it was likely a wood-framed facility built on a concrete pad.
3705	Office	300	300-FF-2	28.6 × 20.7	Demolished	1963	2006	The 3705 Building was initially designed to process film badges worn by Hanford Site employees, and to store personnel exposure records. In the early 1970s, this building's mission was changed to a photography shop. It housed equipment to recover silver from spent film processing chemicals. The 3705 Building was a rectangular one-story concrete building with corrugated metal-sided equipment room and penthouse with a built-up tar and gravel roof, a concrete floor, and no windows. The effluent from the silver recovery equipment was initially disposed to the process sewer until around 1988, when the effluent was disposed of in the sanitary sewer in the 3746D Building, if it met discharge limits. Wash water and overflow from the developers was also disposed of in the sanitary sewer.
3706	Laboratory	300	300-FF-2	99.8 × 42.7	Demolished	1943	2007	The 3706 Building was the original radiochemistry and radiometallurgy laboratory on the Hanford Site and housed development work for REDOX, PUREX, and RECUPLEX processes. In 1954, the 3706 Building underwent a major decontamination and remodeling effort to convert laboratories to office space. The control (sampling) laboratory for uranium fuel fabrication continued to operate into the mid-1960s. In 1964, the 3706 Building housed some analytical laboratories, but most of the space was support services. All laboratory work was phased-out during the 1970s and 1980s.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
3708	Laboratory	300	300-FF-2	22.8 × 15.6	Demolished	1948	2006	The 3708 Building was originally an optical and electrical repair shop or possibly a vehicle maintenance shop. Around 1969, it was modified by Douglas United Nuclear for use as a transuranium pilot facility where neptunium oxide fuel targets were produced and canned in aluminum, and neptunium oxide was combined with graphite into a pellet form and canning in aluminum. The north end of the building in the early 1970s was used for the experimental canning of americium and curium oxide fuel blends. It was subsequently used as a radioanalytical laboratory for the analysis of environmental samples. The building consisted of a 0.15 m (6 in.) concrete slab foundation with footings, concrete block walls, and a concrete slab roof.
3709	Maintenance Shop	300	300-FF-2	20.1 × 14.3	Demolished	1944	2007	The 3709 Building was the 300 Area firehouse until it was replaced by a new firehouse in 1964. The building was then expanded and became the Experimental Mechanics Laboratory for stress testing, accelerometer testing, and pure bend fixture. Around 1978, it was expanded again and the tower was removed; and the building became the paint shop, where large volumes of paint and solvents were also stored. No historical evidence was found that nuclear material was ever introduced into the building. It was a one-story wood frame structure on a concrete slab, asbestos-shaked exterior walls, and a wood-based roof with built-up felt, tar, and gravel surface.
3710	Storage	300	300-FF-2	5.3 × 4.1	Demolished	1959	2001	The 3710 Facility was used for storing various solvents and other chemicals, including oil. The 3710 Building was a concrete block building on a 10 cm (4 in.) thick concrete slab. The only utility the building received was electricity, which was provided from the 3707-D Building. Equipment within the structure included a metal cabinet for oil storage, a drum truck, and barrel pumps.
3711	Maintenance Shop	300	300-FF-2	24.4 × 12.2	Demolished	1960	2006	The 3711 Building was used as a general shop. More recently, it was used as a storage building for property owner materials. It was metal frame with corrugated aluminum siding and an aluminum truss with corrugated covering roof, and a 0.9 m (3 ft) high concrete block foundation on a concrete slab floor. The building was steam heated and had electrical power. It had a sanitary water supply that was likely used for water fountains and the roof swamp cooler, as there were no connections to either a sanitary or a process sewer.
3712	Storage	300	300-FF-2	27.4 × 32.9	Demolished	1959	2006	The 3712 Building was used as a storage building for green (unirradiated) fuel. It was a one-story, steel frame structure with metal panel siding and roof, a concrete floor and foundation. There was no cooling equipment and minimal heating, but the building did have an automatic fire sprinkler system.
3713	Maintenance Shop	300	300-FF-2	36.6 × 12.2 × 5.2	Demolished	1944	2006	The building was originally a receiving storeroom. This building was later converted to a carpenter, painting, and sign shop. It had a 10.16 cm (4 in.) reinforced concrete slab floor supported by concrete block foundation walls with concrete spread footings.
3714	Storage	300	300-FF-2	7.3 × 12.8 × 3.7	Inactive	1955	February 2011 (Scheduled)	The 3714 Building was used to store laboratory solvents, lubricants, and flammable chemicals used in the 300 Area. Later, the 3714 Building doubled as an organic chemistry laboratory, with a hydrogenation facility added to the east end of the facility. It was a one-story building with reinforced concrete walls, roof, and floor.
3715	Storage	300	300-FF-2	24.4 × 24.4 × 3.6	Demolished	1959	2006	The 3715 Building is a metal building constructed from 1959 to 1961 to store green (unirradiated) fuel, reactor fuels component parts, aluminum silicate billets, and related materials. It was a one-story steel frame structure, and was built on grade with corrugated metal siding and roof, a concrete slab floor, and incandescent lighting.
3716	Maintenance Shop	300	300-FF-2	12.2 × 24.4	Demolished	1944	2006	The 3716 Building originally served as the automotive repair and maintenance shop. In 1962, the building was relocated (its original site is now underneath the expanded 313 Building's footprint) and repurposed as a process development laboratory for alternate fuel fabrication process development. Later it was used as a storage building for uranium fuel supplies and fabrication equipment. It was a one-story, metal frame structure with insulated aluminum siding and roof, and concrete floor slab on grade.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
3717	Maintenance Shop	300	300-FF-2	22.3 × 50.3 × 7.3	Demolished	1943	2006	The primary use of the 3717 Building has been for maintenance and craft construction support. It was a tall one-story 5 × 15 cm (2 × 6 in.) wood frame structure, on grade with pitched, 5 × 20 cm (2 × 8 in.) wood truss roof, built on a concrete foundation with concrete slab floor. Exterior walls were covered with asbestos shakes. The building contained offices and rest rooms, an instrumentation fabrication and repair room, a general small equipment repair and test shop, a valve repair assembly and test shop, a tool crib, a chrome-plating room, a metallizing (wire-fed, hot metal coating) work station, a welding room for arc and gas welding, and storage areas including pipe and plate racks adjacent to the building.
3718	Storage	300	300-FF-2	24.4 × 12.2 × 5.5	Demolished	1959 – 1962	2008	Photographs show a sign on the 3718 Building, that it was part of the FRTE Facility, which was in support of FFTF. Its specific use is unknown. It is a prefabricated metal storage building with gable roof, set on a 10.2 cm (4 in.) reinforced concrete slab foundation with footings. An office facility was added to the northeast corner of the building around 1963.
3719	Office	300	300-FF-2	21.9 × 12.2	Demolished	1944	June 2007	The original structure was used as the first aid station until 1955. During the 1960s, it was used as fire protection headquarters. In the 1970s, it served as a transportation dispatching office. The original structure was removed during 1977 and 1978 and was replaced with a one-story modular building with a poured concrete slab foundation. The exterior walls were polyurethane insulated core placed between reinforced pre-cast concrete. The new building was utilized as a document storage facility and then as computer facility administered by Lockheed Martin.
3720	Laboratory	300	300-FF-2	73.2 × 30.5	Demolished	1964	2007	The 3720 Building was originally constructed as the Consolidated Service Facility – Maintenance and Quality Control Laboratory. It provided analytical chemistry support for nuclear fuels fabrication. The 3720 Building was connected to the 300 Area Process Sewer (WIDS 300-15) and the 300 SSS. The underlying soil beneath the 3720 Building and beneath the surfaces around the 3720 Building is a below ground uranium contamination area.
3721	Process Unit/Plant	300	300-FF-2	6.1 × 4.5 × 3.4	Demolished	1964	2008	The 3721 Building was the Classified Shredder Facility, used to destroy sensitive materials. It is a one-story building composed of concrete block walls, cast in-place concrete floor, and a built-up asphalt/gravel roof over corrugated steel panels and structural members. The building originally housed an incinerator unit along with ventilation equipment to support it, including an insulated stack with a metal jacket on the roof of the facility. In 1982, the incinerator was replaced with a paper shredder and disintegrator. The modifications included a dust filter for removing particulates. The facility was serviced by electricity, water, and an underground propane line.
3722	Fabrication Shop	300	300-FF-2	42.7 × 12.8 × 8.8	Demolished	1944	February 2006	This facility was originally used as the general shop for the 300 Area, and later served as a fabrication shop for machining, welding, and grinding for the Fuels Preparation Building (313) and related facilities. During 1964 to 1965, the 3722 Building received new equipment and then from 1965 to 1967, it was used for lithium-aluminate fuel target production. From 1968 to1970, palletized thorium oxide fuel targets were fabricated in the 3722 Building. The building housed a furnace for the “recycling: (reduction) of depleted thorium oxide after it was processed in PUREX. Documentation suggests it was used more recently as a construction shop. The 3722 Building was a one-story wood frame structure with 10 cm (4 in.) concrete reinforced slab floor supported by concrete foundation walls.
3723	Storage	300	300-FF-2	2.7 × 4.9 × 2.7	Demolished	Not Documented	September 2010	The 3723 Building was used to storage acids and solvents, and was the location for waste management and recycling operations, such as a storage location for spent batteries. The 3723 Building was constructed of concrete block walls, with a steel deck roof and a slab concrete floor.
3726	Storage	300	300-FF-2	Building: 9.14 × 4.11 × 4.42 tank: 6.71 length, 1.42 diameter	Demolished	1944	Not Documented	The 3726 Propane Storage Building was a wood framed, open sided, gable roof structure that was supported by six wooden posts resting concrete piers. The roof was three-ply roll roofing over T&G sheathing. Drop siding extended down from the roof to a point approximately 2 m (7 ft) above ground level. The structure housed a single metal storage tank, which was supported by two concrete piers with spread footings. Later on, the structure over the propane tank appears to have been removed (HEDL-MG-17). In 1957, the tank received new concrete supports, and a chain link barricade was placed around the site (H-3-8798).

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Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
3727	Storage	300	300-FF-2	11.3 × 7.1	Demolished	Not Documented	2008	The 3727 Building was used for the secure storage of classified documents and fuel pins. Printed materials stored in 3727 will either be properly destroyed or reviewed to determine if they can be declassified. The 3727 Building was also equipped with storage racks designed for holding fuel pins until they were needed. Fuel pins contained nuclear fuel and were formed when pellets were placed into rods. Fuel pins were placed into bundles and delivered to the reactors (fuel pins are no longer stored inside). It is a concrete block structure with a concrete floor and flat roof, 0.3 m (1 ft) thick concrete walls; the building sits on a poured concrete foundation.
3728	Storage	300	300-FF-2	24.4 × 12.2 × 6.7	Demolished	1980	2008	The 3728 FFTF Test Articles Storage Facility was constructed for storing shipping containers used to transport test articles assemblies associated with FFTF operations. No documentation could be found to determine if 3728 Building storage vaults ever were used to store shipping containers. Modification plans were developed in 1991 for the testing of non-radioactive contaminated soils. It appears that the Geotechnical High-Bay was only used to perform very limited soils testing and that the facility was never modified as fully planned, but this could not be confirmed. Since 1996, the building was used as an environmental sample storage and shipping facility. Environmental samples with chemical and radioactive contaminants are stored in the refrigerators and are packaged at the workbenches before shipping them to laboratories. A limited amount of chemical reagents and preservatives were stored in the facility also. There have been no reported spills associated with these chemicals. It is a pre-engineered metal building.
3730	Fabrication Shop	300	300-FF-2	41 × 12.0 × 4.0	Inactive	1949	December 2011 (Scheduled)	The steel 3730 Building was built as a temporary melting and fabrication building. It likely supported the uranium ingot casting, extruding, and rolling activities in the 313 and 314 Buildings and involved depleted and/or low enriched uranium metal. The 3730 Building was modified in 1955 with an addition to the south end for the Hot Graphite Shop and Storage Building where samples of irradiated graphite and reactor materials were prepared for analysis in the Pile Technology Lab (326 Building) and the Analytical Labs (3706, 325, 329, etc.). Numerous radiation incidents were reported. The original 3730 Building was converted to machining fresh (i.e., cold) graphite components and for the storage of graphite materials, and operated from 1956 to about 1966 when the cold graphite work was moved to the 3731A Building. In 1964, its name was changed to the Graphite Laboratory and Shop. Sometime after 1967, the building was renamed the Gamma Irradiation Facility. Over the years, its mission changed to materials testing for the waste management programs and for the FFTF Project.
3731	Storage	300	300-FF-2	24.4 × 12.2	Demolished	Not Documented	May 2007	The 3731 Building was a metal building with aluminum siding, frame, trusses, and roofing and was originally a U.S. Army mess hall that was relocated to the 300 Area. The south half of the 3731 Building was used to store graphite materials for the adjoining Graphite Machine Shop (3731-A). The 3731 Building was identified as Graphite Storage in 1964. From 1968 to 1987, the 3731 Building was identified as a Fissile Material Storage Facility. The north end of the 3731 Building had a spray paint booth (with a criticality alarm system and a fire protection sprinkler system) that was used to paint and store fissile material shipping drums.
3732	Laboratory	300	300-FF-2	8.6 × 14.7	Demolished	1949	1997	The 3732 Process Equipment Development Laboratory was constructed as an engineering pilot plant for the triple-dip and lead-dip fuel canning processes. Powdered thorium oxide fuel targets for U-233 products were fabricated in the 3732 Building from 1965 to 1967. From 1968 through 1970, pelletized targets were canned in the 3732 Building. Later on, the building was used for maintenance and custodial storage. It was a one-story metal frame structure with exterior walls and roof of corrugated sheet metal, a concrete foundation, on-grade concrete floor, and interior walls of transite panels and sheetrock.
3734	Storage	300	300-FF-2	7.32 × 3.05 × 3.66	Demolished	1944	1997	The 3734 facility was originally used to store gas cylinders, and contained four small cylinder storage spaces. In the 1950s, the 3734 Building was converted to a storage facility for miscellaneous insulating materials including asbestos and industrial glue and fixants and later for general storage. The 3734 Building was built upon a 10 cm (4 in.) thick concrete pad and had 20 cm (8 in.) concrete curtain walls. The walls, which were open at both the top and bottom of the structure, consisted of vertical T&G sheathing.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
3741	Storage	300	300-FF-2	9.14 × 4.27 × 5.03	Demolished	1943	1956	The 3741 Building was originally used to store and prepare samples of irradiated graphite, flux wires, and uranium from the 305 Test Pile Building. These processes created a large amount of radioactive contamination, which was a cause for concern in the early 1950s. The 3741 Building was a one-story, wooden frame building constructed on top of a 10 cm (4 in.) thick reinforced concrete slab with a concrete foundation. The 3741 Building was demolished in 1956, after several years of increasing concern over the radioactive contamination levels within the building. Waste Site 300-268 encompasses the foundation/concrete slab that may have been left behind after demolition.
3745	Laboratory	300	300-FF-2	29.6 × 11.0 × 12.2	Demolished	1944	2007	The 3745 Building was built in 1944 to support the calibration of radiation detection instruments. The building experienced contamination and personnel exposure problems from field-contaminated portable survey instruments and instruments with faulty cases or shielding. An instrument decontamination area was established in the facility around 1945 and major shielding upgrades were added in 1956. The 3745 Building was a two-story wood frame rectangular building with a multiple gable, asphalt, and asphalt shingle roof with three large ventilators.
3746	Office	300	300-FF-2	22.1 × 9.3 × 6.6	Demolished	1945	2007	The 3746 provided support space such as offices, lunchroom, and restrooms for personnel associated with health physics and research, and development projects in the 3746-A, 3745-A, and 3745-B Buildings. The function of the building was to perform tests and verify that the composition of various process substances were within specifications. The building also was used to calibrate thermoluminescent dosimeters. The 3746 Building was one-story wooden building with a gable roof that contained 10 rooms. The rooms consisted of a small electronics laboratory, shop, dark room, storage room, two restrooms, four offices, and a corridor.
3760	Office	300	300-FF-2	31.2 × 46.3 × 9.8	Active	1951	February 2012 (Scheduled)	The 3760 Building housed the Hanford Technical Library in a rectangular, partial two-story structure with no basement. It had a steel framework while the exterior walls were fluted steel insulated panels. The large reading room contained periodical alcoves, open stacks, and private study rooms, while the document files had a microfilm reading room. The facility also provided office space for administrative and drafting personnel, and a 100-seat conference room on the second floor. Utilities serving the building included sanitary water and sewer. The 3760 Building is scheduled to be demolished before 2015 as part of the Tri-Party Agreement M-94 milestone (Ecology et al., 1989).
3762	Office	300	300-FF-2	36.4 × 10.1 × 8.2	Demolished	Moved in 1974	2005	The 3762 Building was relocated to the 300 Area to provide additional office space. It was a two-story wood frame structure with drop siding, concrete footings, concrete block foundation walls, wood flooring, and a composition shingle roof. The facility was steam heated and cooled by evaporative cooling. Utilities serving the building included sanitary water and sewer, and a 150 kVA transformer was located nearby. The building was protected by a wet-pipe sprinkler system.
3763	Office	300	300-FF-2	21.6 × 26.2 × 2.7	Demolished	1970	2005	The 3763 Building was a one-story concrete block structure with a concrete floor covered with carpet and tile, and provided additional office space in the 300 Area. The facility was refrigerated by a central water-cooled unit. A lunchroom was located in the southwest corner of the building and a conference room addition (constructed in 1975) was attached to the north end of the facility.
3764	Office	300	300-FF-2	36.4 × 10.1 × 8.2	Demolished	Moved from 100D	2005	The 3764 Building was a two-story wood frame structure with drop siding, concrete footings, concrete block foundation walls, wood flooring and composition shingle roof. The building was steam-heated and manually controlled. Most rooms had single air conditioning units and evaporative cooling units on the roof. The facility previously had been located in the 100-D Area and known as 1760-D. Before that, it had served as a barracks facility.
3765	Office	300	300-FF-2	18.6 × 61.26 × 3.96	Demolished	1974 (moved)	1996	The 3765 Building was a one-story concrete and steel frame structure used to provide office space in the 300 Area.

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Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
3766	Office	300	300-FF-2	7.3 × 36.6 × 3.0	Inactive	1975	October 2012 (Scheduled)	The 3766 Building was a prefabricated structure used to provide office space in the 300 Area The roof, walls, and floor were of plywood construction while the exterior walls had a pebble aggregate finish. There were 17 offices, a conference room, and restrooms in the building. It had refrigerated air conditioning and electric heat.
3767	Office	300	300-FF-2	7.3 × 36.6 × 3.0	Demolished	1975	Not Documented	The 3767 Building was a prefabricated structure and provided office space in the 300 Area. The roof, walls, and floor were of plywood construction while the exterior walls had a pebble aggregate finish. There were 16 offices and 2 restrooms in the building. It had refrigerated air conditioning and electric heat.
3768	Office	300	300-FF-2	7.3 × 36.6 × 3.0	Demolished	1976	2005	The 3768 Building was a prefabricated structure used to provide office space in the 300 Area. The roof, walls, and floor were of plywood construction while the exterior walls had a pebble aggregate finish. There were 16 offices and 2 restrooms in the building. It had refrigerated air conditioning and electric heat.
3769	Office	300	300-FF-2	7.3 × 36.6 × 3.0	Demolished	1976	2005	The 3769 Building was a prefabricated structure used to provide office space in the 300 Area. The roof, walls, and floor were of plywood construction while the exterior walls had a pebble aggregate finish. There were 16 offices and 2 restrooms in the building. It had refrigerated air conditioning and electric heat.
3770	Office	300	300-FF-2	7.3 × 36.6 × 3.0	Demolished	1976	2005	The 3770 Building was a prefabricated structure used to provide office space. The roof, walls, and floor were of plywood construction while the exterior walls had a pebble aggregate finish. There were 16 offices and 2 restrooms in the building. It had refrigerated air conditioning and electric heat.
3790	Office	300	300-FF-2	30.5 × 24.4	Active	1982	Scheduled Remediation Post-RCC Contract Date (Around 2027)	The 3790 facility provides office space for security personnel in the 300 Area. It is a one-story structure with a basement. The basement and main floor are reinforced concrete. The main floor walls were bolted steel framework with 1.6 cm (0.625 in.) gypsum sheeting and aggregate faced 0.6 cm (0.25 in.) cement asbestos board.
3906	Pump Station	300	300-FF-2	4.3 × 6.0 × 5.6	Active	Not Documented	February 2012 (Scheduled)	The 3906 facility provided a gravity drain collection point in the southeast part of the 300 Area for both the SSS and the process sewer system. The 3906 structure consisted of reinforced concrete, which ranged from 25 to 30 cm (10 to 12 in.) thick. The facility was divided into two separate systems by a wall of concrete. The northern portion of the structure served the sanitary sewer, and contained two 3-hp pumps that could operate at 190 L/min (50 gal/min). The southern portion of the facility contained two 20-hp pumps rated at 2,650 L/min (700 gal/min) and was used for process sewer waste streams.
301-A	Storage	300	300-FF-2	63.32 m^2	Demolished	1943	Not Documented	301-A Storage is removed. Sample preparation activities may be conducted infrequently in an enclosure, depending on the sample activity level or contaminants determined by screening. These practices and controls are considered as low as reasonably achievable with current technology.
303-A	Storage	300	300-FF-2	14.6 × 8.2 × 4.1	Demolished	1943	2006	The 303-A Building was used for the storage of uranium fuel (in the form of rods, billets, or slugs), uranium scrap (contained in 18.9 L [5 gal] buckets, in and around the building), and chemicals used in fuel manufacturing. The 303-A Building was also used for cleaning “dummies,” and runoff went to the process/sanitary sewer. The 303-A Building had no connections to the process or SSS. The cleaning is presumed to have occurred at the concrete pad with process sewer drain that is on the west side of the 303-A Building. The building was constructed of reinforced concrete and concrete block set on a 0.13 m (5 in.) reinforced concrete slab with footings. The roof was a 0.15 m (6 in.) reinforced concrete slab with built-up roofing. The building had two doors on one end, a single door on the opposite end, and no windows. A concrete pad with fence and a catch basin drain at the center of the pad which was connected to the process sewer were added to the west side of 303-A Building between 1952 and 1953.
303-B	Storage	300	300-FF-2	14.6 × 8.2 × 4.1	Demolished	1943	2006	The 303-B Building was used for the storage of uranium fuel (in the form of rods, billets, or slugs), uranium scrap (contained in 18.9 L [5 gal] buckets in and around the building) and chemicals used in fuel processing. The building was constructed of reinforced concrete and concrete block set on 0.13 m (5 in.) reinforced concrete slab with footings. The roof was a 0.15 m (6 in.) reinforced concrete slab with built-up roofing. The building had two doors on one end, a single door on the opposite end, and no windows.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
303-C	Storage	300	300-FF-2	14.7 × 8.3 × 3.1	Demolished	1943	2006	The 303-C Building originally was built and used for the storage of unirradiated uranium billets. In the early 1970s, the building was modified for the storage of special nuclear materials for the Commercial High-Level Waste Fixation Project operated by PNL (BNWI-1017-DEL). The original construction consisted of concrete block walls on a 0.13 m (5 in.) concrete slab floor with foundation, and a 0.15 m (6 in.) concrete slab roof with built-up roofing material. The south end of the building had two doors and the north end had one. In the original construction of the building, a steam supplied heating unit was located in the northeast corner of the building and condensate from the unit drained to a French drain on the outside of the building. One major radiological incident occurred 3/13/1979 during transfer of a plutonium oxide container from 5,791 shipping containers to one of the buildings wall storage tubes. The following modifications were done after the 3/13/1979 plutonium contamination incident. The north end of the building had two entrances, one welded shut (northwest door) and the other being an airlock type entry. The south end of the building had an airlock entry. The east wall had a separate room for a fume hood and glove box. Before the incident, there were no airlock entries, and no area for glove box or fume hood work.
303-D	Storage	300	300-FF-2	14.6 × 8.2 × by 4	Demolished	1943	2006	The 303-D Building has had at least three uses and configurations. The first configuration in 1943 was as a fuel storage facility, designated as 303-D, constructed with concrete block walls, concrete foundation and slab floor, and a reinforced concrete roof. About 1953, the original 303-D Building was incorporated into a larger structure, 3707-D, and the facility was reconfigured to the Operations Change House. The facility was expanded to about 23 m (76 ft) by 35 m (115 ft). The 303-D Building remained as the core of the building with additions on the east, west, and south. The new functions included a change building with lockers, showers, a lunchroom, and offices. The additions were primarily made with wood with steel roof beams and internal, small-diameter steel posts. There were about 50 floor penetrations leading to three branches of the sanitary sewer. In 1971, the building was converted to a design center. The original 303-D portion of the building was referred to as the “tracing vault,” where drawings were stored. An external fire door was added to the vault. In this configuration, most of the areas were used as offices and rooms for drafting tables. The 3707-D Building, which was built around and includes the 303-D Building, was demolished in 2006.
303-E	Storage	300	300-FF-2	14.6 × 8.2 × 4.1	Demolished	1943	2006	303-E was built to store uranium billets, chemicals, and uranium scrap. It has also been referred to as 303-E Finished Fuel Storage. 303-E is identified as Magazine Storage to support the 306 Building pilot plant. It was constructed with concrete block walls, concrete foundation and slab floor, and a reinforced concrete roof and was one-story, one-room, and rectangular.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
303-F	Storage	300	300-FF-2	14.6 × 8.2 × 4.1	Demolished	1943	2006	The 303-F Building was used to store approved and rejected uranium fuel, uranium scrap (contained in 18.9 L [5 gal] buckets, in and around the building), and storage of chemicals used in fuel processing. The building was constructed of reinforced concrete and concrete block set on 0.13 m (5 in.) reinforced concrete slab with footings. The roof was a 0.15 m (6 in.) reinforced concrete slab with built-up roofing. The building had two doors on one end, a single door on the opposite end, and no windows. In the early 1950s, as part of Project CA-514 (300 Area Expansion), 303-F was modified to serve as a chemical makeup facility for the solutions used in the aluminum cleaning, stripping, and anodizing processes performed in the 313 Building (WHC-MR-0388). At this time, floor drains to the process sewer, caustic and nitric acid pumps, caustic mix tanks, caustic tanks, Diversey tanks, chemical storage, a pipe trench, and acid resistant floors were added to the 303-F Building (H-3-10037). In the early 1960s, as part of Project CAF-847 (New Fuel Cladding Facility), a concrete pipe trench was constructed from 333 Building to the 303-F and 311 Tank Farm (H-3-18519, H-3-18530, and H-3-18566); this trench carried a TCE line and a uranium bearing recovery line. The TCE line was connected to a pump in the 303-F Building and this pump was supplied by a TCE tank (H-3-31396) in the 311 Tank Farm; this TCE was utilized for 333 Building operations. The uranium-bearing recovery line passed through the trench in 303-F Building and into the 313 Building (H-3-18530, sheet 3). In 1973, the 300 Area Waste Acid Trench (WATS) came into service and became a RCRA facility in 1976 (DOE/RL-90-11), operating as a tank system for treatment and storage of waste acid (containing non-recoverable uranium). It consisted of tanks, ancillary equipment, and secondary containment structures located in portions of the 334-A Building, 303-F Building, 333 Building, 313 Building, and the 311 and 334 Tank Farms. Utilization of the 303-F Building for WATS began in November 1985 (DOE/RL-90-11) when two uranium recovery caustic pumps (H-3-55499), two cartridge filters, two sample ports, and piping were installed in the building to serve Tank 50 and Tank 40. These tanks are in the 311 Tank Farm on the east side of the building, and transfer solutions back to Tank 5 in the 313 Building (DOE/RL-90-11). RCRA closure activities for WATS began in 1996 and were completed in 1999 for portions of this RCRA treatment and storage facility.
303-G	Storage	300	300-FF-2	14.6304 × 8.2296 × 4.1148	Demolished	1944	2006	The 303-G Building was used for the storage of uranium fuel (in the form of rods, billets, or slugs), uranium scrap (contained in 18.9 L [5 gal] buckets, in and around the building), and chemicals used in fuel processing. The building was constructed of reinforced concrete and concrete block set on 0.13 m (5 in.) reinforced concrete slab with footings. The roof was a 0.15 m (6 in.) reinforced concrete slab with built-up roofing. The building had two doors on one end, a single door on the opposite end, and no windows.
303-J	Storage	300	300-FF-2	16.2 × 19.5 × 8.2	Demolished	1943	2006	The 303-J Building was used to store unirradiated uranium, uranium scrap, and chemicals. Between 1943 and 1954, the exterior of the building was reworked. A full-length, 3.7 m (12 ft) wide extension was added on the east side. The large, sliding, barn-style, side doors were removed and smaller, interior, personnel entry doors were installed. End doors were added on the front along with a wooden, ventilation aperture with louvers. Process sewers, as well as sanitary sewers, drained the facility. In 1961 under General Electric, the facility was used for layout, mockup, and machining. In 1961, PNL installed an overhead ventilation duct system with some rooms covered by ducts and diffusers. The ventilation system was powered and located in the attic. The press pit and sump within the building were filled in with concrete. Two interior pits near the center of the front side of the building were filed and capped in 1961. In 1968, under Douglas United Nuclear, a copper melter-furnace and a lathe were present. The remainder of the building was used as work areas, receiving and inspection, and storage. Post-1968 history is unknown, other than an oral account that beryllium was machined in the facility in 1969. The 303J facility was classified as a Type II facility. A Type II facility is considered potentially contaminated by operations or processes that used hazardous or radioactive materials that could potentially contaminate the building and represent a potential for a release to the environment criteria during D4 activities. The greatest potential for radiological and beryllium contamination was in the attic and ventilation system in the attic. No information was identified or collected from the attic. The facility had a fuel fabrication role and may have had a beryllium fabrication role.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
303-K	Storage	300	300-FF-2	14.6 × 8.2 × 4.1	Demolished	1943	2001	The 303-K Building was used to store uranium and aluminum-canned uranium from 1943 to 1953. It was constructed in 1943 of reinforced concrete and concrete block set on 0.13 m (5 in.) reinforced concrete slab with footings. The roof was a 0.15 m (6 in.) reinforced concrete slab with built-up roofing. The building had two doors on one end, a single door on the opposite end, and no windows. In 1953, the building was partitioned, and floor trench drains and workbenches were installed in the north room. In 1953 and 1978, outdoor storage pads (concrete and asphalt) were constructed to support the decontamination of aluminum reactor spacers until 1971. Beginning in 1953, radioactive and mixed wastes were stored outside the building as well on the concrete, asphalt, and gravel pads. From 1971 to 1977, the north room was used for equipment decontamination and for storage. The interior walls were painted with a lead-based paint in 1977. Between 1977 and fall 1982, the unit was used to cure and test concreted billets of uranium chips and fines from the 304 Concretion Facility. Additional outdoor storage pads were installed in 1978 (asphalt) and in 1979 (concrete). From 1982 to 1986, the building continued to be used for equipment decontamination and storage. After 1986, the building was used to store containers of low-level radioactive waste and mixed waste.
303-L	Storage	300	300-FF-2	4.9 × 7.3	Demolished	1961	1979	The 303-L Building was constructed in 1961 on a concrete slab on the 618-1 Burial Ground. The building itself was made of sheet metal, with a corrugated steel roof. It was rectangular and measured 5 × 7 m (16.4 × 23 ft). The 303-L Building was used to fully oxidize uranium scrap metal and uranium oxide produced during reactor operations. Burning was stopped in 1971 and the building was removed in 1979. The debris from the 303-L Building was buried in the 200W burial ground. The 303-L Building was replaced by the 303-M Building, which was built on the same spot In 1983.
303-M	Fabrication Shop	300	300-FF-2	9.1 × 10.4	Demolished	1983	2006	The 303-M Building was constructed from 1982 to 1983 and operated from 1983 until 1987. It was a small, pre-stressed concrete structure with a reinforced concrete floor slab supported on reinforced concrete foundation. It was located in the northeast of the 300 Area. It was originally used for converting pyrophoric metal (uranium and zircalloy-2) chips and fines to oxide powder. During the 4 years that it was operational, the 303-M Building converted 115 metric tons (127 tons) of uranium scrap into oxide form. The facility contained three rooms: 1) the operations room with six calcinators (in two banks of three each), a chip chopper, and material handling equipment and ventilation ducts; 2) the equipment room with two bag-house filters, two HEPA filter banks, and exhaust system; and 3) the change/monitor room.
305-A	Maintenance Shop	300	300-FF-2	7.3 × 25.6	Demolished	1948	2004	The 305-A Building was initially intended to house electrician and pipefitting shops for support of the 305 Building. However, by 1954, the building was being used entirely for storage. According to WHC-MR-0388, some of the materials stored in the 305-A Building were highly irradiated. From 1954-1955 experiments with highly irradiated boron balls from the Ball 3X project were conducted in the 305-A Building after radiation levels were determined to be too high for the 3706 Building. The 305-A Building was a one-story, wooden frame structure built on a concrete slab. The side of the building was covered with asbestos shaking and the roof was roll tarpaper.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
305-B	Laboratory	300	300-FF-2	36.9 × 5.5 × 2.6	Demolished	1954	Aug 2006	Because of the various roles it played throughout its 50-year history, the 305-B Building complex was known as the TRF, the Process Engineering Laboratory, and the HWSF. The 305-B TRF was a mostly subsurface structure built in 1954 directly south of the 305 Building. It was an underground, reinforced concrete monolith, measuring 37 × 5.5 × 2.6 m high (121 × 18 × 8.5 ft high), with a flat concrete roof, and is surmounted by a small (13.6 m^2) (146 ft^2) entry building/bathroom. The underground TRF operated from about 1954 to 1978 to support the determination of physical constants for various reactor concepts. The 305-B Office Building was a one-story facility built in 1958, and overlapped about one-half of the western portion of the roof of the TRF. It had a concrete block exterior with structural steel supporting the tar and gravel-topped plywood roof, and measures 21.8 × 12.4 m (71.5 × 40.5 ft). The 305-B Office Building also provided office space and some instrument development capabilities during its lifetime. The 305-B HWSF was constructed in 1980 directly west of, and sharing a common wall with, the Office Building. It also overlapped the last one-quarter of the underground TRF, and a portion of the TRF's roof was removed to provide direct access from the HWSF. It was a high-bay facility measuring 23 × 18 × 8.5 m high (75 × 60 × 28 ft high). It contained an individually exhausted fume hood and environmental chamber, four walled storage cells, and a network of spill curbing and trenches. The building was upgraded in 1989 to house dangerous and RMW wastes. Wastes generated during PNNL's research laboratory activities were brought to the facility for storage, repackaging, and/or waste consolidation. This high bay facility stored dangerous wastes, and flammable RMW.
305-P	Maintenance Shop	300	300-FF-2	71.3 m^2	Removed	Not Documented	2002	The 305-P facility was used as a conference room and training facility. The 305-P Building was a small, prefabricated facility located near the 305 Building. On some drawings, it is labeled as the 305 Annex.
306 T6	Office	300	300-FF-2	7.26 × 20.17	Removed	Not Documented	N/A	MO-057 was a doublewide trailer that was divided into an office, work/training area, a small conference room, restrooms, and a small lunchroom. The work/training area was used as a classroom for radiation protection training. It included a small fume hood, two glove boxes, and a mock radiation zone. The facility was served by hot and cold sanitary water and sewer, with 120 V power.
306 T8	Office	300	300-FF-2	7.24 × 20.12	Removed	Not Documented	N/A	306 T8 (MO-024) was a doublewide mobile office trailer facility in the 300 Area. It was divided into eight offices, a reception area, and two restrooms. It was served by hot and cold sanitary water, sanitary sewer, and 120 V electric power. The MO-024 facility provided additional office space for personnel working in the 306-W facility. It was originally known as 306 T8, but was later renumbered as 306W T2.
306-E	Laboratory	300	300-FF-2	61.0 × 55.2	Demolished	1956	2007	The 306-E Building was completed in 1956 as the Met Semi-Works. It shared a common wall with the 306-W Building. The initial mission included the development and fabrication of experimental fuel elements. In 1960, the 306 Building was expanded to approximately double its original size to contain the pilot plant for the co-extrusion fabrication process for N Reactor fuel elements. The 306 Building continued to support fuel manufacturing until the pilot plant was shut down around 1971. The operational history of the 306-E Building from 1972 varied as to be expected for an engineering laboratory. General operations included prototype equipment design, testing, and development, qualitative and quantitative analytical testing of material in a chemical laboratory, product and equipment testing for R&D. In 1989, the 306-E Building was described as providing large, high clearance and heavy floor loading space for assembling, inspecting, and testing of equipment. The main activities in the 306E Building in 1995 were focused on Hanford Site cleanup work including the setup and checkout of a variety of equipment and systems of the Tank Waste Remediation System, Solid Waste, Spent Nuclear Fuel, and various other groups on the Hanford Site. Operations in the 306-E Building were phased out by 2004 and the 306-E Building was turned over for eventual demolition in late 2004.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
306-W	Laboratory	300	300-FF-2	48.8 × 59.7	Demolished	1956	2007	The 306-W Building was completed in 1956 as the Met Semi-Works and shared a common wall with the 306-E Building. In 1960, the 306 Building was expanded to approximately double its original size to contain the pilot plant for the co-extrusion fabrication process for N Reactor fuel elements. Its initial mission of what became 306-W was to support 313 Building operations and to pilot process improvements in single-pass reactor fuel fabrication methods. This included the development and fabrication of experimental fuel elements. With the shutdown of the single-pass reactors in the 1960s, the mission of the 306-W Building transitioned into that of metallurgical R&D. The R&D mission continued until the facility was shut down in the early 2000s. By early 2004, the 306-W Building had been vacated.
307-D	Storage Tank	300	300-FF-2	length: 3.05 diameter: 12.19	Removed	1961	N/A	The 307-D tank (Rupture Loop Holding Tank, WIDS 300-55) was a UST, 12.2 m (40 ft) in diameter and 3.05 m (10 ft) tall with a sloping top. The tank was located approximately 61 m (200 ft) northeast of the 309 Facility and southwest of the 324 Building. Liquid waste routed to this tank was sampled. If contaminated, it was sent to the 340 Complex through a 7.6 cm (3 in.) underground pipeline. If the waste was not contaminated, it was diverted to the Columbia River by a 1 m (3 ft) diameter outfall line. Although an exact date cannot be determined, the tank was removed sometime in the 1970s and buried in a 200 Area burial ground. All RLWS connections were cut and plugged. The abandoned river outfall line was cut near the 3906 Pump Station.
308 T2	Office	300	300-FF-2	17 × 7.3	Inactive	1978	2008	This facility (MO-036) is a doublewide trailer located northwest of the 340 Building. It was used by the FH 340 organization to hold pre-job and safety meetings. It housed the technicians who operated 340 and the engineering manager. In the late 1990s the 327 project began using the facility as office space for support staff, and continued using the space for 3 years. The facility has been unoccupied since that time.
310-A	Process Unit/Plant	300	300-FF-2	Not Recorded	Demolished	1959	1974	The 310 Building received waste steam from the 309 PRTR facility. The steam was chilled and condensed back into liquid water within this structure. Cooling was achieved using raw river water provided by the 312 Pump House. After being liquefied, the water was released to a process sewer line that drained directly to the river (H-3-11683). The original 310 Building was a small steam condenser station located east of the 309 Building. It was constructed primarily of concrete, with much of the structure below grade. This facility was known only as 310, not 310-A. The name 310-A is being used here to differentiate this facility from TEDF, which was also assigned the 310 number.
331-A	Laboratory	300	300-FF-2	20 × 6.1	Demolished	1972	2000	The original 331-A Building was a one-story concrete block structure 20 × 6.1 m (67 × 20 ft) with an extension 10 × 13.5 m (33 × 44.25 ft) containing 15 pen areas for large animals. The main portion of this flat-roofed structure originally contained three laboratories, a mechanical equipment room, and an office area, while the pen areas contained swine. An animal crematory was located to the east of the laboratory. The 331-A facility originally was designed to house a miniature variety of swine for use in biology research. The swine were used most often for studying the effects of radiation exposure to skin and hair. In the early 1980s, the facility was converted to a virology lab, which studied the growth of bacteria and viruses in animals. Virology research continued until 1995. Radiologically exposed animals (by ingestion or injection) were generally held in other areas of the 331 Facility outside of the 331-A Building. Their feces were monitored until there was no evidence of radioactivity, and then the animals were returned to their pens in 331-A.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
331-B	Laboratory	300	300-FF-2	11 × 44	Demolished	1967	September 2002	The 331-B Buildings were used to support biological research conducted in PNNL's 331 Complex. Specifically, the 331-B Buildings were used to provide an animal housing area where dogs were raised and maintained for use in program activities by PNNL. The 331-B Buildings consisted of two roughly rectangular-shaped structures (an eastern structure and western structure), both running north south. The north end of each structure was attached to PNNL's 331 Building. Operations started in 1968, with kennels for about 100 dogs. Additional dog runs were built between about 1970 and 1975, at which time the total kennel space increased to house approximately 650 dogs. Several rooms in the 331-B Laboratory were also equipped to handle exposed dogs, which included the hospital room, surgery room, and clinic room. Exposed dogs were housed in "metabolism cages." These cages were used to isolate the exposed dogs, provide independent air filtration, and collect animal waste for analysis. PNNL's operations in the 331-B Buildings ceased in about 1989. The Hanford Patrol used the dog runs from 1990 to about 1993 as kennels for the Hanford Site guard dogs.
331-BA	Laboratory	300	300-FF-2	Not Documented	Active	1967	Scheduled Remediation Post-RCC Contract Date (Around 2027)	The 331-B Buildings were used to support biological research conducted in PNNL's 331 Complex. Specifically, the 331-B Buildings were used to provide an animal housing area where dogs were raised and maintained for use in program activities by PNNL. The 331-B Buildings consist of two roughly rectangular-shaped structures (an eastern structure and western structure), both running north south. The north end of each structure is attached to PNNL's 331 Building. Operations started in 1968, with kennels for about 100 dogs. Additional dog runs were built between about 1970 and 1975, at which time the total kennel space increased to house approximately 650 dogs. Several rooms in the 331-B Laboratory were also equipped to handle exposed dogs, which included the hospital room, surgery room, and clinic room. Exposed dogs were housed in "metabolism cages." These cages were used to isolate the exposed dogs, provide independent air filtration, and collect animal waste for analysis. PNNL's operations in the 331-B Buildings ceased in about 1989. The Hanford Patrol used the dog runs from 1990 to about 1993 as kennels for the Hanford Site guard dogs.
331-C	Storage	300	300-FF-2	30.5 × 15.2	Active	1972	May 2011 (Scheduled)	The 331-C Building was a Butler building erected on a concrete slab. It had a low gable metal roof and served as a storage warehouse for the 331 Buildings. Heating was provided by electric space heaters. The 331-C Building provided temporary storage space for equipment and store acquisitions until they were needed by program activities. The building served the entire 331 complex. More recently, the building has been converted to store hazardous chemicals (06-AMRC-0058).
331-D	Laboratory	300	300-FF-2	12.9 × 9.8	Active	1974	May 2011 (Scheduled)	From 1973 to 1974, the 331-D Building, a semi-high bay, prefabricated, metal Butler building was erected on a concrete slab to the southeast of the 331 Building and originally served as the Animal Waste Treatment Facility. It contained a 94,630 L (25,000 gal) per day (net) capacity waste treatment plant that operated to chemically treat, mechanically flocculate and settle, and then gravity filter animal wastes. A sludge dryer also was installed to heat and dry 54 kg (120 lb) per hour of sewage sludge product from the treatment facility and to produce a 65 to 100 percent solid waste material that could be buried in 100 and 200 Area trenches. In 1977, when the 331-D Building was converted to electromagnetic studies, "clean" animal sewage was routed to the regular 300 Area SSS for disposal. In 1977, the building was converted into the Biomagnetic Effects Laboratory. Research activities involved exposing small animals (typically rats) to electromagnetic fields. In early 1990, the facility was converted to general storage space.
331-E	Laboratory	300	300-FF-2	9.1 × 15.9	Demolished	1975	Not Documented	The 331-E Building provided an environment in which to grow plants for PNNL's ecosystem studies. It was a wood and metal frame structure covered with translucent, corrugated fiberglass sheets. Located just south of the 331-D Building, this facility had a rounded, Quonset hut-type roof. Utilities included water, normal building power, and propane gas for heating. Two evaporative swamp coolers were located on the east side of the building.
331-F	Storage	300	300-FF-2	21 × 5	Demolished	1975	Not Documented	The 331-F Building was a prefabricated metal structure to support a pasture. It provided storage space for equipment and materials used in animal and pasture maintenance. The only utility the building received was electricity.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
331-G	Storage	300	300-FF-2	18.3 × 6.1	Active	1975	May 2011 (Scheduled)	The 331-G Farrowing Facility was constructed in 1975 and was located just east of the 331-F Building. The flat-roofed structure sat on a concrete slab. Utility services to the building included sanitary water and normal building power. A heat pump provided heating and air conditioning. The 331-G Building was originally used to house laboratory animals (specifically swine) while they were giving birth. Later on, it was converted to an archive for radioactively contaminated animal tissue samples. All samples were removed and disposed of in 1977. More recently, the 331-G Building was being used for radiotracer studies. Small quantities (μCi) of tracer radionuclides were deposited in soil, taken up by vegetation, and then fed to small animals. The animals were temporarily housed in the facility, and their excrements were stored in closed containers within the facility.
331-H	Laboratory	300	300-FF-2	5.4 × 19.7	Active	1979	May 2011 (Scheduled)	In 1979, the 331-H Plant Exposure Facility was constructed just north of the 331-F Building. This one-story concrete block structure provided space to accommodate the exposure equipment required for performing advanced stages of research on plants. Experiments typically involved exposing plants to various aerosols and actinide elements in the wind tunnel. In 1980, metal lean-to was attached to the northwest corner of the 331-H Building. This lean-to contained a wind tunnel room, a growth chamber alcove, two air locks, mechanical and equipment rooms, change rooms, and an entry area. An HVAC lean-to building containing HEPA filters was located on the west side of the building, along with a concrete pad that contained a power transformer and an emergency generator.
331-HB	Barn	300	300-FF-2	3.8 × 2.6	Demolished	1975	Not Documented	The 331 Hoghouses were constructed of corrugated aluminum on a concrete pad and were used to shelter animals in the large pasture to the south of the 331 facility. They were constructed in pairs, and had “guillotine” doors to provide access to the animals. Heating was provided by infrared lamps and hot water circulated within the concrete pads. Drinking water was also provided for the animals. Utilities serving each unit consisted of 120 V AC power and sanitary water.
331-J	Barn	300	300-FF-2	7.3 × 4.9 × 4.3	Demolished	1984	Not Documented	The 331-J Hay Storage Barn was constructed in 1984 and was located just east of the 331-H Building. It was a beam and column structure that had a roof and cave extension of 0.9 m (3 ft) and a steel framed roof covered with galvanized steel decking. The south end of this hay and bulk feed storage facility was open. A bulk feed bin was located to the east of the barn on a concrete foundation. It was electrically operated auger type with an elevated bin. Power to the feed bin was supplied by the nearby 331-G facility. The purpose of the 331-J facility was primarily to store hay and feed for the large animals being used in the 331 complex. An incinerator for animal carcasses was installed sometime around 1988.
333 T1	Office	300	300-FF-2	173.14 m^2	Demolished	Not Documented	N/A	MO-052 is a doublewide transportable mobile office. The building was used as temporary office space. Standard types of janitorial supplies were stored in the building.
334-A	Storage	300	300-FF-2	6.1 × 12.2	Demolished	1973	2005	In the early to mid-1970s, the WATS was installed to treat acid containing non-recoverable uranium generated from the 333 Building fuels fabrications operations. As part of the WATS installation, a building from the 200 Area was installed over a former limestone neutralization pit in 1973 and designated 334-A Waste Acid Storage Building. The tanks in the 334-A Building replaced a WATS underground tank (the limestone neutralization pit) that had developed a leak to the soil. The 334-A tanks began handling waste in December 1974. The portion above grade in the 334-A Building was used for general storage of products and absorbents, and the portion below grade contained three tanks (A, B, and C) seated in a reinforced concrete pit 3 m (10 ft) deep. Tank A was a vertical cylindrical tank with a capacity of 1,363 L (360 gal). Tank A is constructed of steel with a PVC liner. Tanks B and C are horizontal cylindrical tanks with a capacity of 7,571 L (2,000 gal) each. Tanks B and C are constructed of high-density polyethylene.
337-B	Laboratory	300	300-FF-2	53.9 × 23.3 × 28.4	Demolished	1972	2010	The 337, 337-B and 3718-M Buildings were constructed in the early 1970s for Project BAP-048, the HTSF. These buildings provided space and facilities for engineering studies in support of FFTF and the LMFBR program at the Hanford Site. The main system in the 337B Building was the Composite Reactor Components Test Activity sodium-environment test system. Additional FFTF development missions performed in the 337-B Building was the invention of a gas tagging system for fuel assemblies to detect ruptures, and sodium and argon cover gas purification methods were developed here. The use of this facility in the support of FFTF continued until the late 1970s. In the early to mid 1990s, the 337-B Building was utilized for the demonstration of a robotic test bed in support of tank waste retrieval. No equipment remains from these tests.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
339-A	Control Structure	300	300-FF-2	18.3 × 24.4 × 4.6	Active	1986	Scheduled Remediation Post-RCC Contract Date (Around 2027)	The 339-A Building is a one-story building with walls, roof, and floor constructed from pre-stressed concrete. A 2.4 m (8 ft) tall fence with three layers of barbed wire surrounded the exterior of the building. There are four exterior doors to the facility, and no windows. The interior of the 339-A Building is divided into two functional areas. The administrative area includes space for three offices, lunchroom, restrooms, and storage. The secure area is a vault type area comprised of the computer room, tape vault, mechanical/electrical room, communications equipment room, and encryption room. The 339-A Building was a controlled access facility that was used for sensitive computing purposes. The building included an intrusion detection system and a closed circuit television system to prevent unauthorized access. During unattended operating hours, the building could be accessed using a PIU. Only one of the four doors to the building could be opened from the outside.
340-A	Storage Tank	300	300-FF-2	9.8 × 13.0 × 7.0	Active	1961	July 2011 (Scheduled)	The 340-A Building is a steel frame structure and contains six 30,280 L (8,000 gal) stainless steel tanks. The 340-A Building provided additional storage space for liquid radioactive waste before it was sent to the 200 Area for disposal. The waste originated from several different buildings in the 300 Area, including 308, 325, 326, 327, and 329, and was transported to the 340 Complex through the RPS piping system. Originally, the waste was transported away from the site in trucks, although later on train cars were used.
340-B	Loading Dock	300	300-FF-2	15.2 × 19.5 × 8.5	Active	1965	July 2011 (Scheduled)	In 1965, the 340-B rail load-out facility was constructed as part of a modernization effort that substituted shielded rail cars for tanker trucks in the transport of radioactive effluents from the 340 tanks to the 200 Area. The 340 complex received high-level radioactive liquid waste from several buildings in the 300 Area through the RPS piping system. Before transport to the 200 Area, the waste was stored in tanks located in the 340 and 340-A Buildings. The 340-B Facility is a structure with corrugated steel walls and roof and a total area of 297 m^2 (3,200 ft^2). It has two large roll-top doors on the west side and can accommodate two 75,700 L (20,000 gal) rail tank cars at once.
3506-A	Maintenance Shop	300	300-FF-2	4.6 × 13.4 × 11.0	Demolished	1944	2005	The 3506-A Building originally housed phone service equipment as part of the HEW telephone network installed in 1943-44. The 3506-A Building's function changed at an unknown date in the 1960s or 70s and became the Powerhouse Mechanical Maintenance Shop. It housed maintenance personnel and shop maintenance equipment to support the 384 Power House, which supplies heating and humidification to 300 Area buildings.
3506-B	Maintenance Shop	300	300-FF-2	80.3 m^2	Demolished	Not Documented	2005	The 3506-B Building was a prefabricated metal structure built on a concrete pad and used as a maintenance shop.
3506-C	Office	300	300-FF-2	43.31 m^2	Active	1995	April 2011 (Scheduled)	The 3506-C Building is a modular trailer “hut” used to support computing in the 300 Area. It contained several racks for equipment, two UPSs, and fire equipment. An air conditioner unit is attached to one end of the trailer. The 3506-C Building is used for fiber optic network connections to the 300 Area facilities.
351-A	Electrical Substation	300	300-FF-2	21.3 × 11.4	Active	1943	Scheduled Remediation Post-RCC Contract Date (Around 2027)	This Substation consists of a wooden fenced, gravel-surfaced area, containing wooden frame bus structures, three power transformers, circuit breakers, and terminal structures. The site did not include a switch house. The area contained open-framed, wooden poles extending to a height of 11.4 m (37.5 ft). A wooden ladder and walkway of 30 cm (2 ft) planking provided access to the upper sections of the pole structure where the Oil Circuit Breakers and insulators were located. Concrete foundation pads were provided for the three 250 kVA transformers. The transformer bases contained 1.2 m^3 (1.6 yd^3) of concrete. The 351-A Substation was first energized on 8/6/1943. It served as the major electrical substation for the southern portion of the 300 Area, providing power to a number of important facilities including the 384 Complex.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
351-B	Electrical Substation	300	300-FF-2	19.2 × 17.7	Active	1943	Scheduled Remediation Post-RCC Contract Date (Around 2027)	The 351-B Substation was designed primarily to support the 305 Reactor Building and was later expanded to service the entire 300 Area. As a result, the facility was upgraded several times during its operation. Originally, the site consisted of a wooden fenced, gravel-surfaced area with a reinforced concrete and concrete block switch house that was located midway along the south fence line. The site was expanded significantly to the south, incorporating the 352-A substation and adding a new metering and testing building, known as 351-A, by 1978. The 351-B switchgear building also received an extension that effectively doubled its size. According to the waste site report for 300-4, the building was actually completely rebuilt in the late 1960s or early 1970s. Later on during site operations, the 351-B Substation was often referred to as the DOE 351 Substation or as 351-A&B.
352-A	Electrical Substation	300	300-FF-2	Not recorded	Inactive	Not Documented	Not Documented	The 352-A facility was constructed in the late 1940s and was located southeast of the original 351-B Primary Substation. The 352-A Electrical Substation originally operated as a 115 kV/2400 V substation in support of the 300 Area. In particular, it was directly associated with the nearby 313 Building. The 352-A substation and the 351-A Meter and Testing Building were both incorporated into the 351-B substation. It consisted of a reinforced concrete pad, which was divided into two main sections with a gap in the middle. Each section housed a transformer and electrical switchgear equipment. Underground electrical ducts connected the 352-A facility to the smaller substation serving the 313 Building. The 351-A Building was a corrugated metal building that housed metering equipment for the 351 Substation. Although the exact date of construction is unknown, it was in place by 1978. The waste site write-up for 300-4 suggests that the 351-A structure was built in 1949. It was located at the south end of the 352-A substation, filling in the gap between the two halves of the 352-A structure's concrete pad.
352-B	Electrical Substation	300	300-FF-2	9.45 × 8.69	Demolished	1949	Not Documented	The 352-B substation was a fenced-off facility that was located west of the 313 Building in the 300 Area. It consisted of a rectangular concrete pad that housed transformers and other electrical equipment, and included underground cable trenches. An underground cable pit was located within the fenced area, north of the concrete pad. Power cable trenches connected the 352-B substation to the 352-A/351-B substations to the north. Electric lights were located at the edges of the concrete pad. The 352-B facility served as a low-voltage electrical substation in the 300 Area, operating at 2300-440 V.
352-C	Electrical Substation	300	300-FF-2	6.71 × 3.81	Demolished	Not Documented	Not Documented	The 352-C facility served as an electrical substation in the 300 Area. The original 352-C facility was replaced by a new facility in 1982. This metal building contained 2.4 kV switchgear (rated at 5.0 kV) along with a battery bank and charger. In 1985, a small addition was installed on the southwest side of the facility. This pre-fabricated aluminum building housed a breaker panel and was equipped with HVAC.
352-D	Electrical Substation	300	300-FF-2	12 × 6.1	Removed	1965	Not Documented	The 352-D Building was designed as an automatic electrical distribution substation for the 321, 321-B and 321-C facilities. In the late 1960s, the 321 Complex was being utilized as a thermal hydraulic (mechanical) pilot plant to support the FFTF project, so the 352-D Building appears to have been constructed to support those activities. In 1990, the facility was converted from an automatic substation to a manually operated switching station. In 2002, the electrical distribution and controls systems were removed from the facility. The building was then reallocated for storing chemicals and renamed 3718-S.
352-E	Electrical Substation	300	300-FF-2	18.4 × 9.8	Inactive	1972	February 2011 (Scheduled)	The 352-E Building served as a breaker station for facilities in the eastern portion of the 300 Area and was a dust-tight, prefabricated steel building with a gable roof. The largest section of the building was the switchgear room, which was occupied by switchgear equipment, while the northern wall contained a rolling door. The 352-E Building had an extension on the northwest corner of the building that, unlike the rest of the facility, was insulated and was used as a battery room.
352-F	Electrical Substation	300	300-FF-2	9.8 × 6.1 × 3.7	Active	1976	Scheduled Remediation Post-RCC Contract Date (Around 2027)	The 352-F Building served as a switch station for various facilities within the 300 Area. The 352-F Building was constructed in 1976 on a concrete slab and was associated with electrical substation C3-S4. The building had a metal roof, metal siding, a metal door, and a sheet metal gutter located above the doorway. In 1984, the 352-F Building was expanded with a new switchgear building constructed on the west side of the existing structure. The new attachment was a prefabricated galvanized steel building. A manhole inside the addition leads down to a cable vault running underneath the facility.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
3614-A	Monitoring Station	300	300-FF-2	3.7 × 3.7	Inactive	1959	Scheduled Remediation Post-RCC Contract Date (Around 2027)	The 3614-A Building was designed to automatically sample water from the Columbia River for various constituents. Water was diverted from the 312 intake structure and pumped to the 3614-A Building using a suction pump located within the facility. After sampling, water was flushed back to the 312 facility. Equipment within the building included a pump, sampling and counting equipment, and a monitoring tank.
3614-B	Monitoring Station	300	300-FF-2	1.2 × 0.4	Demolished	Not Documented	1997	The 3614-B Sampling Station was used for analyzing water as it was released into the 316-5 Process Waste Trenches. The 3614-B Sampling Station consisted of a steel cabinet that was located on top of the outlet structure at the head of the 300 Area Process Trenches (Waste Site 316-5). Inside the cabinet were containers for storing samples, a pumping system, and various automatic sampling equipment.
3621-B/C	Electrical Substation	300	300-FF-2	3.0 × 9.8 × 4.9	Active	1963	February 2012 (Scheduled)	The 3621-B and 3621-C Buildings were two prefabricated steel structures used to provide emergency power. 3621-B housed the generator and 3621-C contained switchgear and control equipment. In 1991, the 3621-C underground fuel oil storage tank was installed south of the 3621-C Building, replacing the original above ground fuel tank that had been in the 3621-C facility. In 1993, the 3621-B and 3621-C Buildings were combined into a single facility, 3621-B/C. In 1993, the two buildings were incorporated into a single new metal building which enclosed all of the equipment from the two original structures.
3621-D	Electrical Substation	300	300-FF-2	24.4 × 12.2 × 5.2	Demolished	1973	November 2010	The 3621-D Building originally was used to house three emergency diesel-powered generators. The original 3621-D Building was constructed as a prefabricated corrugated steel structure on a concrete foundation with an on-grade concrete floor slab. The one-story building consisted of a single room that housed three diesel-powered generators. An addition onto the north side of the building was completed in 1991 to accommodate a fourth, smaller diesel powered generator. The original 3621-D Diesel Storage Tank was removed in December 1994. In addition, diesel-contaminated soil was removed down to a depth of 3 m (10 ft). The replacement tank, 3621-66, was scheduled for removal in 2008.
3701 HUT	Storage	300	300-FF-2	Not recorded	Removed	1953	N/A	A temporary building (3701-A) and historical photographs suggest that this building was a Quonset hut. The location of this building and the period it was active suggests that it was related to the construction of the 305-B Building and perhaps other 300 Area facilities. This hut may have been used for storage space, office space, and/or fabrication shops.
3701-A	Office	300	300-FF-2	2.2 × 2.2	Demolished	1963	1993	The 3701-A was a small shack that replaced the original 3701 Building as the entry point to the 300 Area on Apple Street. It was designed as a facility for verifying the identification of personnel entering the 300 Area. The foundation of the building extended 0.3 m (1 ft) below grade, and the roof was constructed of built up tar and gravel. An air cooler was located on the roof of the building.
3701-AA	Office	300	300-FF-2	5.96 × 4.84	Demolished	1980	1994	The 3701-AA Building was used along with 3701-A to verify the identification of personnel entering the 300 Area. It was usually referred to as 3701-A, even though the original 3701-A was still in existence during the period when this building was active. It was built on top of a concrete slab and the building itself was constructed out of concrete masonry units. The roof of the facility was gravel surfaced.
3701-D	Office	300	300-FF-2	21.0 × 15.0	Demolished	1979	2005	The 3701-D Building provided a headquarters for the Hanford Site patrol, the Security Operations Center, and the Emergency Control Center for emergency situations in the 300/400 Areas, such as evacuations and criticalities. It was constructed in 1979 as a one-story structure with a basement. In 1989, an addition was attached to the south side of the building for use as an emergency control center. It was an underground structure built at the level of the 3701-D basement with reinforced concrete walls.
3701-L	Office	300	300-FF-2	14 × 18.6	Demolished	1952	1980	The 3701-L Building was two-story wood-frame badge house constructed in 1952. It provided security-checking stations, clock alleys for time clock recording, and badge racks. The building was modified and expanded in 1953. As of 1964, the first floor contained six clock alleys and security patrol checking stations. There was also one interview room, restroom facilities, and an HVAC unit. The second floor contained four offices, a small lunchroom, a storage closet, one small restroom, and a janitor closet. The original 3701-L Building was removed in 1980 and replaced by a new facility with the same name.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
3701-LA	Office	300	300-FF-2	4.84 × 5.96	Demolished	1980	1994	The 3701-LA Building was usually referred to as 3701-L, even though it replaced the original 3701-L Building. It was used to verify the identification of personnel entering the 300 Area. It was built on top of a concrete slab and was divided into two sections, an inspection area and a guard area. The building itself was constructed of concrete masonry units and the roof of the facility was gravel surfaced.
3701-N	Office	300	300-FF-2	6.5 × 6.9 × 3	Demolished	1964	Not Documented	The 3701-N Building was a small concrete-block building used to verify the identification of personnel entering the 300 Area. The facility had built-up asphalt roofing with gravel surface over a metal fascia, with an evaporative cooler located on the roof. The building had four doors and contained card racks, time clocks, badge racks on the walls, and a desk and counter.
3701-NA	Office	300	300-FF-2	5.96 × 4.84	Demolished	1980	1994	The 3701-NA Building was used to verify the identification of personnel entering the 300 Area. It was referred to as 3701-N, although it was the replacement for the original 3701-N facility. It was built on top of a concrete slab and was divided into two sections, an inspection area and a guard area. The building itself was constructed of concrete masonry units and the roof of the facility was gravel surfaced.
3701-R	Office	300	300-FF-2	1.5 × 3	Demolished	Unknown	1980	The construction of the original 3701-R Building is not known with any certainty. The building may have been a prefabricated metal guardhouse.
3701-RA	Office	300	300-FF-2	2.28 × 3.85 × 3.45	Demolished	1980	1994	The 3701-RA Building was used to verify the identification of personnel in vehicles entering the 300 Area. It was constructed in 1980 at a location just west of the old 3701-R facility. The building was constructed of spilt-faced fluted concrete masonry unit for the lowest part of the structure, with tubular steel columns above that. It had an aggregate-faced cement asbestos board fascia below the gravel-surface built-up roof.
3701-S	Office	300	300-FF-2	18.43 m^2	Demolished	Not Documented	1980	3701-S was used to verify the identification of personnel in vehicles entering the 300 Area. This small shack-type facility was replaced by a new facility with the same name (3701-SA).
3701-SA	Office	300	300-FF-2	Not Recorded	Demolished	1980	1994	The 3701-SA Building replaced the original 3701-S Building and was constructed of spilt-faced fluted concrete masonry unit for the lower part of the structure, with tubular steel columns above that. It had an aggregate-faced cement asbestos board fascia below the gravel-surface built-up roof.
3701-T	Office	300	300-FF-2	5.5 × 3.66 × 2.5	Demolished	1975	1994	The 3701-T Building was used as a guard station for controlling access to the 308 Building and surrounding facilities. Later on, it was apparently used as an emergency staging area. It was an aluminum-framed structure with insulated aluminum siding and an insulated metal roof. The interior of the building contained specialized screening equipment and a desk and counter. The facility had five doors for controlling the flow of personnel into and out of the 308 protected area.
3701-TR	Office	300	300-FF-2	7.3 × 20.1	Demolished	Not Documented	Not Documented	The 3701-TR Building was a doublewide mobile office trailer facility that was used as office space for security personnel in the 300 Area.
3701-U	Office	300	300-FF-2	183.54 m^2	Demolished	1978	Not Documented	The 3701-U Building was designed to serve as the guard station for the 308-324-325 Building exclusion area and later was used as an office building. The 3701-U was a one-story facility constructed of concrete block and stucco with a built-up asphalt and gravel roof. The building originally contained a variety of screening equipment.
3701-Z	Office	300	300-FF-2	3.1 × 4.3	Demolished	Not Documented	Not Documented	The 3701-Z Badge House was located outside the 300 Area fence and was used to store badges for construction contractors. It was a one-story concrete building constructed on a concrete pad and had a built-up roof.
3703-A	Office	300	300-FF-2	20.1 × 8.5	Removed	Not Documented	2004	The 3703-A Building was a doublewide modular trailer that provided office space.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
3704 HUTS	Storage	300	300-FF-2	Not recorded	Removed	1953	N/A	Six temporary buildings (3704-B, 3704-C, 3704-D, 3704-E, 3704-F, and 3704-G) were located on the western edge of the 300 Area in 1954 near the 3704 Building (H-3-10182). They may have been related to the construction of the 305-B Building and perhaps other 300 Area facilities and may have been used for storage space, office space, and/or fabrication shops.
3704-R	Storage	300	300-FF-2	Not recorded	Demolished	Not Documented	2004	The building was used to support J.A. Jones operations in 1964. Later on, the building appears to have been used for storage of insulator materials. The 3704-R name was never used; it is being used here only to differentiate this building from the original 3704 structure. The building was a metal frame structure with corrugated aluminum siding and roof and a concrete block foundation. Piping to the building included sanitary water and sewer lines.
3705 T1	Office	300	300-FF-2	7.25 × 17.1 × 3.7	Demolished	1977	Not Documented	The MO-026 mobile office trailer was a doublewide mobile office trailer with power, sanitary water and a sanitary sewer connection. The MO-026 Building was used as office space by photography and graphics personnel until the mid 1990s, and then used as office and storage space to support groundwater sampling.
3707-A	Change House	300	300-FF-2	36.88 × 11.58 × 4.72	Demolished	1944	1989	Originally the 3707-A Building was used as a change house, and it was converted into a maintenance office in 1964. In 1983, the facility was used to provide office space for drafting personnel. It was a one-story, rectangular building built on a 10 cm (4 in.) thick concrete slab and was supported by a concrete block foundation walls with spread footings.
3707-B	Change House	300	300-FF-2	4.8 × 13.3	Demolished	1944	1996	The 3707-B Building was originally designed to serve as a change house. By 1964, it was being used as an office and storage space for custodial services. Starting in October 1978, the west end of the building was used as an overtime lunch distribution station. It was a one-story wood frame structure on grade with a concrete block foundation and concrete slab floor.
3707-C	Laboratory	300	300-FF-2	53.64 × 12.19 × 5.5	Demolished	1948	1996	The 3707-C Building was added as an annex to the 3706 Building in 1948. The 3707-C Building was originally used to house various facilities that were needed for workers in the attached 3706 Building, including a lunchroom, change rooms, and sanitary restrooms. By 1964, it was used as a computer lab and then it provided laboratory space for supporting automation instrumentation and control development. It was a one-story concrete block building with a concrete floor on grade, a gable roof with asphalt shingles, and interior partitions of gypsum board on wooden studs on moveable metal.
3707-D	Office	300	300-FF-2	35.0 × 23.2	Demolished	1943	2006	This facility had at least three uses and configurations. The first configuration in 1943 was as a fuel-storage facility, designated as 303-D. About 1953, the facility was expanded and reconfigured to the “Operations Change House, with lockers, showers, a lunch room, and offices. In 1971, the building was converted to a design center. In this configuration, most of the areas were used as offices and rooms for drafting tables.
3707-E	Storage	300	300-FF-2	6.1 × 12.2	Demolished	Not Documented	2004	The 3707-E Building provided office space and lunchroom facilities for subcontractors of the J.A. Jones company. Later on, it also served as a storage location for various materials. The 3707-E Building had a metal frame with corrugated aluminum siding and roof, a concrete block foundation.
3707-F	Monitoring Station	300	300-FF-2	3.6 × 3.6	Active	1963	July 2012 (Scheduled)	The purpose of the 3707-F Building was to provide a radiation monitoring office and shielded personnel survey space for those involved in the waste handling facilities at the 340 Building. The 3707-F Building is a prefabricated, self-framing galvanized steel-panel structure erected on a concrete slab. In 1978, much of the original equipment was removed from the building, including the shielded cubicle and restroom facilities.
3707-G	Change House	300	300-FF-2	17.8 m^2	Demolished	Not Documented	2001	The 3707-G Building served as a change room supporting operations in 303-K. It was a wood-framed, sheet-metal shack that was constructed adjacent to the 303-K facility.
3707-H	Maintenance Shop	300	300-FF-2	12.2 × 9.1	Demolished	Not Documented	2007	The 3707-H Building served as a change room facility for Operations Support Services crafts. It was a one-story, insulated, modular-type, re-locatable structure placed on a reinforced concrete wall footing.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
3709-A	Office	300	300-FF-2	33.5 × 28.9 × 10.1	Active	1964	Scheduled Remediation Post-RCC Contract Date (Around 2027)	The 3709-A Building served as the primary fire station for the 300 Area. It has a concrete foundation and a tower that was three stories tall, concrete exterior walls. It includes a garage, bedrooms, offices, equipment storage, restroom, kitchen, hose room, and shop. A fuel-dispensing island was located to the south and east of the east wall of the 3709-A Building, which consisted of two underground fuel tanks and pump equipment. Shortly after the two tanks were observed to be leaking, the fuel island was removed and patched over with asphalt.
3709-B	Storage	300	300-FF-2	8.5 × 6.1 × 3.0	Active	1976	Scheduled Remediation Post-RCC Contract Date (Around 2027)	The 3709-B Building was originally constructed as a storage facility for equipment associated with the 3709-A Fire Headquarters. In 1993, it was converted into a weight training room for firefighters stationed at the 3709-A Building. It is a prefabricated, self-framing metal building.
3710-A	Storage	300	300-FF-2	6.1 × 63.66	Demolished	Not Documented	2001	The 3710-A Building was used to store solvents and greases. There were a number of spills and leaks of materials stored in drums in and around this building over the years. It was a one-story sheet metal Butler structure constructed of sheet metal siding, steel frame, a gabled roof covered with sheet steel, and a concrete foundation and floor.
3710-B	Storage	300	300-FF-2	Not recorded	Demolished	Moved 1979		The 3710-B facility was used to store flammable materials in the 300 Area. The 3710-B Building was a prefabricated sheet metal building that was placed on a concrete pad in the 300 Area.
3717-B	Fabrication Shop	300	300-FF-2	12.5 × 51.2 × 4.4	Demolished	1950	2006	The 3717B Building was known as the Standards Laboratory and provided maintenance, calibration, and standards services to the 300 Area, starting in 1950. It was a one-story, concrete block and metal structure (prefabricated partitions) with an addition in 1964. An addition in the early 1980s added a metrology lab.
3717-C	Storage	300	300-FF-2	14.6 × 14.6 × 4.0	Inactive	1971	December 2012 (Scheduled)	The 3717-C Building was originally constructed as the Sodium Components Sub-Assembly Building. In 1973, the building was repurposed as an archive building for materials relating to FFTF. It is a square, corrugated sheet metal building with a concrete foundation.
3718-A	Storage	300	300-FF-2	12.2 × 24.4 × 5.5	Demolished	1959	2008	The 3718-A Building was used along with 3718-B and 3718-C for the loan and storage of laboratory equipment. It was used most recently by the Spent Nuclear Fuels MCO Basket Project as a staging facility as indicated by signs currently on the building. 3718-A and 3718-B were constructed similarly of metal framing placed on a reinforced concrete slab with partial concrete walls. The inside was sheet-rocked from the top of the partial wall to where the roof joists start. The outside of the two buildings consisted of metal siding and the roof of each building is metal. The buildings were constructed adjacent to each other and later a concrete slab was poured between the buildings so they could be joined together with a roofed annex.
3718-B	Storage	300	300-FF-2	12.2 × 24.4 × 5.5	Demolished	1959	2008	The 3718-B building was used along with 3718-A and 3718-C for the loan and storage of laboratory equipment. It was used most recently by the Spent Nuclear Fuels MCO Basket Project as a staging facility as indicated by signs currently on the building. 3718-A and 3718-B were constructed similarly of metal framing placed on a reinforced concrete slab with partial concrete walls. The inside was sheet-rocked from the top of the partial wall to where the roof joists start. The outside of the two buildings consisted of metal siding and the roof of each building was metal. The buildings were constructed adjacent to each other and later a concrete slab was poured between the buildings so they could be joined together with a roofed annex.
3718-C	Storage	300	300-FF-2	12.2 × 24.4 × 5.5	Demolished	1959	2008	The 3718-C building was used along with 3718-A and 3718-B for the loan and storage of laboratory equipment. It was used from approximately 2001 to 2005 by FH insulators for storage per WCH Site Maintenance and Utilities. This building was of a similar construction as 3718-A and 3718-B. On the east side of the building, a covered area and enclosed storage area were added to the building during the 1960s. The addition was constructed of metal framing and corrugated metal on the sides and roof. The enclosed storage area was insulated with spray-on insulation.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
3718-D	Storage	300	300-FF-2	6.1 × 15.24	Demolished	1960	1979	The 3718-D facility may have been used for storage purposes. It was built on a concrete pad. Two additional concrete pads were located on the east side of the building. The 3718-D building was completely removed in 1979 and replaced with the 3728 facility.
3718-E	Storage	300	300-FF-2	30.6 × 9.2	Demolished	1967 (moved)	2008	The 3718-E Building provided storage space for equipment and materials associated with the 324 Building. It was an open truss structure with sheet metal siding and roof and rested on a 0.76 m (2.5 ft) high concrete foundation wall. The floor of the 3718-E Building was a concrete slab.
3718-F	Storage	300	300-FF-2	6.1 × 14.6	Demolished	1968	1996	The 3718-F Facility began treatment (oxidation/neutralization) of alkali metal waste in 1968 and ended operations in June 1987. Storage activities also began in 1968 and continued until May 1989. Initially, spent alcohol and water baths were drained into the process sewer system. Later, after the alcohols were regulated in 1985, the spent alcohol baths were drummed and sent to the 616 Nonradioactive Dangerous Waste Storage Facility for disposal. The spent water baths continued to drain to the process sewer system. It consisted of a one-story corrugated steel storage building, an adjoining loading pad, and an adjoining concrete pad. A burn shed with accompanying fume scrubber, two reaction tanks for cleaning equipment, and a safety shower were located on the adjoining concrete pad. It also included two reaction tanks.
3718-G	Storage	300	300-FF-2	12.2 × 30.5 × 3.0	Demolished	1978	2008	The 3718-G Building was used for storing various chemicals and equipment. It was associated with the 324 Complex, which was located south of the building. The 3718-G Building was a rectangular one-story, all metal pre-manufactured building erected on concrete foundations and slab. Utility services included normal building power, electric heat, sanitary water, and a sanitary sewer floor drain system. An isolated chemical storage area was located within the building and contained a safety shower and floor drain plus an aerated eye/face wash.
3718-M	Storage	300	300-FF-2	26.3 × 7.1 × 3.8	Demolished	1970	2010	The 337, 337B and 3718M Buildings were constructed in the early 1970s for the HTSF. These buildings provided space and facilities for engineering studies. The building is set on a foundation that has 0.38 m (1.25 ft) thick walls and 0.5 m (1.5 ft) floor, all composed of reinforced concrete. The walls of the building, above grade, are composed of 0.2 m (8 in.) concrete block.
3718-N	Maintenance Shop	300	300-FF-2	22.3 × 12.3 × 4.3	Demolished	1975	2008	The original purpose of the building was to support electrical maintenance personnel with offices, storage, and equipment. From 1989 to 1995, the building was used as an insulator shop. The most recent usage of the building was by FH's vegetation management operations, where herbicides were stored for about a year before turnover of the building to WCH in August 2005. This building was a prefabricated metal storage building with a flat roof and sloped sides. The building was set on a 15 cm (6 in.) reinforced concrete slab with footings.
3718-O	Storage	300	300-FF-2	4.8 × 15.2	Demolished	Not Documented	Not Documented	The 3718-O Building may have been used to store HEPA filters during the late 1980s and early 1990s. It was a prefabricated galvanized steel facility that was originally the 318-A Building in the southern portion of the 300 Area. It was relocated to a site northwest of the 3731 Building in the late 1980s and renamed as 3718-O.
3718-P	Storage	300	300-FF-2	60 × 18	Demolished	1996	2009	The 3718-P Building was used as a storage facility. By 2007, the building had been vacated. However, it was then reoccupied and once again used as a storage facility. Two connexes were placed near the facility in 2007. 3718-P was a metal building on a concrete slab with a gable type metal roof. Services included a fire protection system and normal electrical power. Most of the floor space was used for storage, although a small office was located in the northwest corner of the building.
3719-A	Office	300	300-FF-2	8.5 × 20.1	Removed	1994	1999 (Moved)	The 3719-A facility served as a first aid station when it was in the 300 Area. It was a doublewide modular office trailer facility.
3722 HUTS	Storage	300	300-FF-2	Not recorded	Removed	1953	2006	Two temporary buildings (3722-B and 3722-C) were located near the 3722 Building in 1954. Historical photographs suggest that the buildings were Quonset huts, similar to other temporary facilities used throughout the Hanford Site. The location of these buildings and the period they were active suggest that they were used to support construction activities in the mid-1950s, a period of major expansion in the 300 Area. Based on the use of TC buildings associated with other reactor facilities, these huts may have been used for storage space, office space, and/or fabrication shops.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
3722-A	Maintenance Shop	300	300-FF-2	1,125.64 m^2	Demolished	1944	Late 1950s	The 3722-A Building was originally the TC-36 Receiving M.S. Warehouse, a TC building. The construction of this building is unknown. Although originally a temporary building, the 3722-A structure was retained as a permanent facility. Since it had originally been designed for storage, various shop equipment most likely were installed circa 1945 when the facility was repurposed to be one of the two maintenance shops in the 300 Area. Contaminated items scheduled for burial were stockpiled just north of this facility in the late 1940s.
3726-A	Storage	300	300-FF-2	3.7 × 3.7	Demolished	1979	Not Documented	The 3726-A Building was used to store compressed air cylinders for use in the event of an emergency. Its walls were 20 cm (8 in.) thick fluted, split-faced CMU and the roof was built-up with gravel surfacing.
3731-A	Storage	300	300-FF-2	24.4 × 12.2	Demolished	1966	May 2007	The 3731A Graphite Machine Shop was used to work on cold (nonradioactive) graphite. The facility machined graphite and provided storage of graphite material until 1995 when it was placed in standby condition. It was a concrete block building on a concrete slab with a 4:12 pitched wooden truss roof. The concrete block east wall of the 3731A Building was built flush to the metal west wall of the 3731 Building. There was a doorway through the adjoining wall to the 3731A Building.
3734-A	Storage	300	300-FF-2	9.1 × 7.9 × 4.3	Demolished	1944	1997	The 3734-A Building originally was used as a cylinder storage building, similar to the 3734 Building. In the 1950s, it was converted into the 300 Area paint storage facility, and continued to serve in that role into the 1990s. Materials stored within the building included paints, paint thinners, paint removers, and solvents. It was a one-story wooden building on a 10 cm (4 in.) reinforced concrete slab.
3745-A	Laboratory	300	300-FF-2	22.3 × 5.3	Demolished	1947	2007	The 3745-A Building was a shielded laboratory space for health physics research on ion bombardment. The accelerator program was terminated in 1995 and the particle accelerators were removed. After which, the 3745-A Building was used primarily for storage space. It was a rectangular with concrete block walls, concrete shielding walls, and a concrete slab floor.
3745-B	Laboratory	300	300-FF-2	7.9 × 4.6	Demolished	1949	2007	The original 3745-B Building was constructed in 1949 to provide a shielded accelerator laboratory and was used for instrument calibration and research. It was a rectangular concrete and wood frame building with a high bay center section with north, south, and west additions of concrete/concrete block. Experimental work was shutdown in 1995.
3746-A	Laboratory	300	300-FF-2	29.5 × 15.8	Demolished	1948	2007	The 3746-A Building (Radiological Physics Laboratory) provided laboratory and office space for PNNL's Radiological Science Department. Its operational history is not well documented. It was originally constructed in 1948 on a concrete foundation with an on-grade concrete floor slab and contained a total of four offices, seven laboratories and support rooms, a water purification room, and a mechanical room, of various sizes. An addition was constructed in 1981 similar to the original structure that added four offices and two laboratories. Utilities serving the building included sanitary water and sewer and the process sewer line.
3746-D	Laboratory	300	300-FF-2	17.3 × 6.4	Demolished	1960	2006	In 1960, the 3746-D Building was constructed originally as the Craft Training Hutment. It was a Quonset-type arched facility with corrugated sheet metal except the ends are plywood. It was used to conduct training classes for crafts workers in the maintenance of instruments and electrical equipment. The 3746-D Building became a storage treatment facility (Technical Service Annex) in support of the 3705 Building. In about 1984, the building was used to recycle silver from photochemical wastes to recover silver. The effluent from the silver recovery equipment was initially disposed of to the sanitary sewer. Starting around 1992, the containerized process effluent was shipped offsite. Piping for silver waste input or output between 3705 and 3746-D has not been identified and it is inferred that wastewater was handled in containers before and after treatment. The 3746-D Building was demolished, the concrete slab was removed, and the site was leveled without the need for clean fill material. The area is posted as an URMA.
3760 T3	Office	300	300-FF-2	7.25 × 17.1 × 3.7	Removed	Not Documented	N/A	The MO-929 facility was a doublewide trailer that contained seven offices of various sizes, a work area, and a small restroom. Space was provided to accommodate eight personnel. Utilities serving the building included sanitary water, sanitary sewer, and electricity.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
3802-A	Process Unit/Plant	300	300-FF-2	3.0 × 3.0 × 2.4	Inactive	1964	Not Documented	The 3802-A facility provided steam to 337 and related buildings and consisted of a small building and an underground substructure. Waste steam from the 309 PRTR facility was routed to this facility through underground piping, where it would be reduced in pressure before being piped to the 337 facility. The facility may also have been used for introducing chemical additives into the steam. The 3802-A facility consisted of a small building and an underground substructure.
3902-A	Storage Tank	300	300-FF-2	6.1 × 7.6	Demolished	1943	2002	The 3902-A facility was an elevated steel water tank, the base of which was 38.4 m (126 ft) off the ground. The tank had a capacity of 283,900 L (75,000 gal). The 3902-A tank provided a water supply for fire protection purposes in the 300 Area. According to HAN-10970, water was chlorinated before it was stored in the tank. At first, the entire 300 Area water supply was obtained from two wells, which were located near the southeastern edge of the original area boundary. After 1975, the water in these tanks was most likely supplied by the 315 Building. A valve pit was located under the tank, which was accessible by a manhole. A steam heating system was in place to protect water in the tank from freezing.
3902-B	Storage Tank	300	300-FF-2	8.5 × 8.5	Demolished	1949	2002	The 3902-B facility was an elevated steel water tank, the base of which was 38.4 m (126 ft) off the ground. The tank had a capacity of 378,500 L (100,000 gal). A valve pit was located under the tank, which was accessible by a manhole. A steam heating system was in place to protect water in the tank from freezing. A sump was located in the bottom of the valve pit. The 3902-B tank provided a water supply for fire protection purposes in the 300 Area. According to HAN-10970, water was chlorinated before it was stored in 3902-A, and presumably also for 3902-B when it was installed. Initially, the entire 300 Area water supply was obtained from two wells, which were located near the southeastern edge of the original area boundary. After 1975, the water in these tanks was most likely supplied by the 315 Building.
3906-A	Pump Station	300	300-FF-2	5.64 depth	Active	Not Documented	December 2012 (Scheduled)	The 3906-A facility serves as a gravity collection point and lift station for the sanitary and process sewer systems. The lift station consists of an at-grade concrete pad and a 5.6 m (18.5 ft) deep concrete pit with walls up to 0.3 m (1 ft) thick.
3906-B	Pump Station	300	300-FF-2	9.83 m^2	Active	Not Documented	January 2013 (Scheduled)	The 3906-B facility serves as a gravity collection point and lift station for the sanitary and process sewer systems.
3906-C	Pump Station	300	300-FF-2	2.6 × 1.4 × 2.1	Active	Not Documented		The 3906-C Sanitary Sewer Sample Station is an in-ground vault with a sanitary sewer line running through the bottom of the vault to Richland.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
Boiler Annex	Manufacturing Facility	300	300-FF-2	Not recorded	305-BA -Demolished 306E-BA – Demolished 318-BA, - Inactive 320-B - Inactive 323-BA - Inactive 324-BA - Inactive 325-BA - Inactive 326-BA - Inactive 327-BA - Inactive 328-BA - Demolished 331-BA - Inactive 337-BA - Demolished 3705-BA - Demolished 3706-BA - Demolished 3720-BA - Demolished 382-BA - Inactive	1997-1998	305-BA 2006 306E-BA 2007 318-BA 2017 320-BA July 2012 323-BA March 2013 324-BA ~2013 325-BA ~2017) 326-BA June 2014 327-BA July 2011 328-BA 2007 331-BA ~2017 337-BA - 2010 3705-BA – 2007 3706-BA – 2007 3720-BA – 2007 382-BA – Jan 2012	The boiler annexes are pre-engineered metal buildings on concrete slabs. The annexes contain sumps varying in size and each one contains a sump pump. Each annex has 7.6 cm (3 in.) curbing around the sump and water softener. Ten of the annexes contain one package boiler each while the remaining six contain two package boilers each. All of the boilers are natural gas fired steam boilers. Of the 16 Boiler Annexes in the 300 Area, seven have been demolished (305-BA, 306E-BA, 328-BA, 337-BA, 3705-BA, 3706-BA, and 3720-BA). The remaining 10 Boiler Annexes are scheduled for demolition between 2011 and 2017.
MO-265	Laboratory	300	300-FF-2	173.43 m^2	Active	Not Documented	Not Documented	The RCF, comprised of MO-265 and MO-423, is a minor source for potential diffuse and fugitive radionuclide emissions resulting from the preparation and counting of radiological samples (for example, soil or smears) from CERCLA projects, within the 300 Area, 100 Area, and ERDF. Since this facility receives only samples associated with CERCLA response actions, it will continue to operate under CERCLA authority in accordance with DOE/RL-2005-87. IOM 131311 replaced terms and conditions in AOP-00-05-06 and the Washington State Department of Health License.
MO-391	Storage	300	300-FF-2	2.4 × 9.8	Active	2005	Not Documented	The facility is a singlewide mobile office facility placed so that it could remain mobile and move south as demolition activities proceed. It is used to store H-1 drawings and measuring and test equipment cabinets.
MO-423	Laboratory	300	300-FF-2	121.6 m^2	Active	Not Documented	Not Documented	The RCF, comprised of MO-265 and MO-423, is a minor source for potential diffuse and fugitive radionuclide emissions resulting from the preparation and counting of radiological samples (for example, soil or smears) from CERCLA projects, within the 300 Area, 100 Area, and ERDF. Since this facility receives only samples associated with CERCLA response actions, it will continue to operate under CERCLA authority in accordance with DOE/RL-2006-48. Terms and conditions in AOP-00-05-06 and the Washington State Department of Health License were replaced in WMI-RCF001.
MO-741	Office	300	300-FF-2	7.3 × 3.0	Inactive	1993	2008	The facility was a singlewide trailer that contained one main room used as an office and no internal partitions, installed adjacent to the 340 Building complex. The facility was used as office space by radiological control technician and nuclear chemical operator personnel until the late 1990s.
MO-767	Office	300	300-FF-2	3.7 × 17	Active	2008	Not Documented	The facility is a singlewide mobile office facility used as a D-4 conference trailer.
MO-779	Office	300	300-FF-2	8.5 × 19.5	Active	2008	Not Documented	MO-779 is a doublewide mobile office trailer facility located southeast of the 324 Building used to support D-4 Project personnel.
MO-827	Office	300	300-FF-2	7.3 × 18.3	Active	2008	Not Documented	MO-827 is a doublewide mobile office trailer facility located southeast of the 324 Building. It provides office space for D-4 Project personnel.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
MO-905	Office	300	300-FF-2	7.3 × 18.3	Demolished	1997	2007	This doublewide trailer was used by the Field Remediation Radiological Controls group as a temporary office space, meeting room, and lunch area. One room of the trailer was also used for counting radiological air samples and smears, and performing source checks. The building was not subject to loose contamination, and removal of samples and instrumentation at building turnover will remove radiological inventory and controls. The MO-905 information reviewed was from 1997 service dates to present. No prior information for this facility was found. MO-905 was a doublewide, 7.3 × 18.2 m (24 × 60 ft) transportable metal clad building on a steel frame located in the north central region of the 300 Area.
401	Office	400	300-FF-2	Not recorded	Demolished	Not Documented	1996	FFTF Visitor's Center.
402	Storage	400	300-FF-2	27.74 × 27.43 × 9.14	Active	1995	Not Documented	The SSF was designed to receive liquid sodium containing trace amounts of potassium through batch transfers from FFTF by way of transfer lines connecting the two facilities. However, this building was never used.
403	Storage	400	300-FF-2	34 × 27 × 12	Inactive	Not Documented	Not Documented	The principal equipment in the Fuel Storage Facility is a below ground cell containing a carbon steel storage vessel for storing up to 466 FFTF spent fuel assemblies in liquid sodium.
405	Reactor	400	300-FF-2	1330 m^2	Inactive	Not Documented	Not Documented	FFTF reactor containment building.
408	Process Unit/Plant	400	300-FF-2	53.3 × 30 (each)	Inactive	Not Documented	Not Documented	The HTS DHX East, South, and West each are pits containing four DHX modules tied together with structural steel framing in the form of a cross (referred to as the cruciform area). At the ends of the structures is a partial roof providing weather protection for the DHX fans and fan motors. The sodium piping and components in the DHXs contain internal contamination from the tritium in the secondary sodium.
409	Process Unit/Plant	400	300-FF-2	Not recorded	Inactive	Not Documented	Not Documented	The Closed Loop DHXs 1 and 2 contain sodium-to-air heat exchangers designed to transfer heat from the sodium to the atmosphere by forced convection. The closed loop systems were never put into operation.
427	FMEF	400	300-FF-2	4,950 m^2	Inactive	Not Documented	Not Documented	FMEF.
432-A	Storage	400	300-FF-2	27 × 37	Inactive	Not Documented	Not Documented	The 400 Area Interim Storage Area has been designated for aboveground dry cask storage of spent fuel.
436	Training Facility	400	300-FF-2	37 × 12	Inactive	Not Documented	Not Documented	The facility provides classrooms and the reactor control room simulator that was used for operator training certification.
437	Maintenance Shop	400	300-FF-2	88 × 29	Active	Not Documented	Not Documented	The MASF has a deep subgrade structure to provide shielded pits for specialized storage, sodium cleaning, and maintenance services. It also contains three decontamination suites equipped with negative pressure ventilation for low-level decontamination of small tools, components, and miscellaneous equipment. The facility has provisions for the collection and temporary storage of contaminated liquids. It is also used for equipment modification and assembly, testing, and training for the 200 Area Tank Farms. Current plans for the facility include use of the sodium removal systems for disposition of sodium residuals.
440	Storage	400	300-FF-2	18 × 6	Active	Not Documented	Not Documented	The 90 day storage pad is a covered and enclosed pad for the accumulation of HW.
451-A	Substation	400	300-FF-2	1,221.4 m^2	Active	Not Documented	Not Documented	The 115 kV/13.8 kV Substation is a typical electrical substation with the equipment mounted on spread footings and equipment pads.
453	Transformer Station	400	300-FF-2	6 × 2 (each)	Inactive	Not Documented	Not Documented	The Transformer Stations 2.4 kV East, South, and West are located on 6 × 2 m (20 × 6.6 ft) concrete transformer pads. The power distribution system consists of switchgear units that feed plant equipment such as the primary and secondary sodium pumps, DHX fan motors, and ex-contaminated chilled water chillers.
4621E	Auxiliary Equipment Building	400	300-FF-2	40 × 18	Active	Not Documented	Not Documented	The building contains plant control, auxiliary equipment, radiation monitoring, access control, and an emergency diesel generator.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
4621W	Auxiliary Equipment Building	400	300-FF-2	37 × 15	Inactive	Not Documented	Not Documented	The building contains electrical distribution and switchgear areas plant control, auxiliary electrical equipment rooms, and an emergency diesel generator.
4701-A	Guard Station	400	300-FF-2	18 × 9	Inactive	Not Documented	Not Documented	The Kentucky Boulevard Guard Building is used by security personnel and to control access to the FFTF-protected area.
4703	Control Structure	400	300-FF-2	27 × 24	Active	Not Documented	Not Documented	The building houses the Reactor Control Room, a computer room, lockers and restrooms, and office space on the ground level. A cable spreading room, control rod drive mechanism cabinet room, and a telephone equipment room are located in the basement.
4710	Office	400	300-FF-2	96 × 37	Active	Not Documented	Not Documented	The building provides office space for FFTF Engineering, Operations, and other support staff.
4713-A	Riggers and Drivers Operations Facility	400	300-FF-2	495 m^2	Inactive	Not Documented	Not Documented	The building provided office space for maintenance and craft personnel.
4713-B	Maintenance Shop	400	300-FF-2	2,796 m^2	Inactive	Not Documented	Not Documented	This building is used for maintenance activities.
4713-C	Storage	400	300-FF-2	389 m^2	Inactive	Not Documented	Not Documented	This area is used for equipment storage.
4713-D	Storage	400	300-FF-2	651 m^2	Inactive	Not Documented	Not Documented	This area is used for equipment storage.
4716	Rigging Loft	400	300-FF-2	123 m^2	Active	Not Documented	Not Documented	This area is used for storage of tools and equipment used for plant maintenance.
4717	Reactor Service Building	400	300-FF-2	46 × 15	Active	Not Documented	Not Documented	The Reactor Service Building has underground cells for offsite cask loading and for storage and processing of radioactive gases and waste. The building includes cell atmosphere processing system cells and pipe ways, and access for trucks and railroad cars to the equipment airlock.
4718	Storage	400	300-FF-2	1,072 m^2	Active	Not Documented	Not Documented	
4721	Emergency Generator Building	400	300-FF-2	26 × 15 × 6.7	Active	Not Documented	Not Documented	The Emergency Turbine Generator Building contains the Oil Fired Turbine Generator and its associated switchgear that provides emergency power.
4722-D	Carpenter Shop	400	300-FF-2	Not recorded	Demolished	Not Documented	1986	
4722-E	Rigging Loft	400	300-FF-2	Not recorded	Inactive	Not Documented	Not Documented	
4722-F	Fabrication Shop	400	300-FF-2	Not recorded	Removed	1976	N/A	The facility was originally used to provide workspace for boilermakers in the 400 Area. Later, it appears to have been used as a warehouse facility.
4734-A	Storage Pad	400	300-FF-2	12 × 14	Active	Not Documented	Not Documented	The Nitrogen Dewar Pad is a concrete pad on which the dewar tanks are mounted. Nitrogen is used as the atmosphere for cells and pipe ways that house primary sodium piping and/or equipment to prevent a fire should a primary sodium leak occur.
481	Pump House	400	300-FF-2	12 × 11	Active	Not Documented	Not Documented	The two Water Pump House Buildings (481 and 481A) contain pumps that distribute water to meet requirements for sanitary, fire protection, and process water usage at FFTF and other 400 Area Buildings.

Table B-2. Summary of 300 Area Facilities

Facility Code	Facility Type	Area	Operable Unit	Site Dimensions (m)	Facility Status	Construction Date	Demolition Date	Facility Description
482	Storage Tank	400	300-FF-2	1,136 m^3 each	Inactive	Not Documented	Not Documented	The 482A, 482B, and 482C water storage tanks have a capacity of 1,136 m^3 (40,177 ft^3) and store well water.
483	Chemical Addition Building	400	300-FF-2	30 × 23	Inactive	Not Documented	Not Documented	This facility includes the cooling tower and attached chemical addition building. There are eight modular forced draft evaporative cooled, closed loop cooling towers that were used to support auxiliary cooling to primary sodium cells and certain components that could be impacted by the high operating temperatures of the reactor and HTS.
484	Water Equipment Building	400	300-FF-2	37 × 15 × 8	Inactive	Not Documented	Not Documented	The In-Containment Chilled Water Equipment Building encloses four chiller units with associated pumps, tanks, and piping.
4742-B	Switchgear Building	400	300-FF-2	Not recorded	Inactive	Not Documented	Not Documented	
491	HTS Service Buildings E & W	400	300-FF-2	40 × 30	Inactive	Not Documented	Not Documented	The HTS Service buildings are structurally connected and contain the secondary sodium pumps and piping as well as other portions of the HTS and Closed Loop System sodium equipment, switchgear, controls, and electrical equipment. The secondary sodium is slightly radioactive due to tritium that has diffused into the system.
491S	HTS Service Building South	400	300-FF-2	24 × 15	Inactive	Not Documented	Not Documented	This building contains the cesium trap, equipment for primary sodium sampling (including a small remote operation hot cell), closed loop sampling, cover gas monitoring and sampling, decontamination, and building inert gas cooling. This building is primarily a radioactive materials area in accessible locations. There are also some radiation areas where primary sodium piping is located. The only known contamination area is Cell 490, the sodium sampling cell.
MO-929-400	Office	400	300-FF-2	Not recorded	Removed	Not Documented	N/A	The doublewide trailer contained seven offices, a work area, and restroom. Sometime before 1984, the facility was removed from the 400 Area and installed near the 3760 Building in the 300 Area.

Notes:

Stewardship Information System, as of 1/09/2009.

J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for, but was not detected to be greater than or equal to the estimated quantitation limit.

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Appendix C

Geophysical Logs

Contents—Geophysical Logs

C7653

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C8028

C8029

C8030

C8245

Stoller Hanford Office established 1959

HGLP-LDR-530, Rev. 0

399-1-54 (C7653)
Log Data Report

Borehole Information:

Borehole:	399-1-54 (C7653)		**Site:**	300-FF-5	
Coordinates (WA St Plane)		**GWL[1] (ft):**	32.2	**GWL Date:**	11/11/10
North (m)	**East (m)**	**Drill Date**	**TOC Elevation**	**Total Depth (ft)**	**Type**
Unknown	Unknown	11/17/10	Unknown	118.5	Sonic

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded steel	3.8	12	10 7/8	9/16	3.8	46.2
Threaded steel	0.1	10 1/2	9 5/8	7/16	0.1	110

Borehole Notes:

The total depth and casing depths were reported by the Geologist. The logging engineer measured casing diameters rounding to the nearest 1/16-in.

Zero reference is ground surface.

Spectral Gamma Logging System (SGLS) Equipment Information:

Logging System:	Gamma 4N		**Type:**	SGLS SN: 45TP22010A
Effective Calibration Date:	1/25/10	**Calibration Reference:**	HGLP-CC-051	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Neutron Moisture Logging System (NMLS) Equipment Information:

Logging System:	Gamma 4M		**Type:**	NMLS SN: H340207279
Effective Calibration Date:	1/18/10	**Calibration Reference:**	HGLP-CC-052	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	3	4 Repeat	5	6 Repeat	
HEIS number	1017300	1017301	1017302	1017303	
Date	11/11/10	11/11/10	11/17/10	11/17/10	
Logging Engineer	McClellan	McClellan	McClellan	McClellan	
Start Depth (ft)	0.0	38.0	42.0	105.0	
Finish Depth (ft)	43.0	43.0	113.0	113.0	
Count Time (sec)	100	100	100	100	
Live/Real	R	R	R	R	
Shield (Y/N)	N	N	N	N	
MSA Interval (ft)	1.0	1.0	1.0	1.0	
Log Speed (ft/min)	N/A	N/A	N/A	N/A	
Pre-Verification	DNF11CAB	DNF11CAB	DNF21CAB	DNF21CAB	
Start File	DNF11000	DNF11044	DNF21000	DNF21072	
Finish File	DNF11043	DNF11049	DNF21071	DNF21080	
Post-Verification	DNF11CAA	DNF11CAA	DNF21CAA	DNF21CAA	
Depth Return Error (in.)	N/A	0	N/A	0	
Comments	No fine gain adjustments.	No fine gain adjustments.	No fine gain adjustments.	No fine gain adjustments.	

Stoller Hanford Office established 1959

HGLP-LDR-530, Rev. 0

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	1	2 Repeat			
HEIS number	1017304	1017305			
Date	11/11/10	11/11/10			
Logging Engineer	McClellan	McClellan			
Start Depth (ft)	0.0	0.0			
Finish Depth (ft)	31.0	4.0			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N/A	N/A			
MSA Interval (ft)	0.25	0.25			
ft/min	N/A	N/A			
Pre-Verification	DMS12CAB	DMS12CAB			
Start File	DMS12000	DMS12125			
Finish File	DMS12124	DMS12141			
Post-Verification	DMS12CAA	DMS12CAA			
Depth Return Error (in.)	N/A	1.0 high			
Comments	None	None			

Logging Operation Notes:

SGLS data were collected using Gamma 4 HO 68B-3573. Pre and post survey verification measurements were acquired in the Amersham KUTh-115 field verifier. A centralizer was installed on the sonde.

NMLS data were collected using Gamma 4 HO 68B-3573. Pre and post survey verification measurements were acquired in the AmBe standard field verifier. A centralizer was installed on the sonde.

Analysis Notes:

Analyst:	C. Nelson	Date:	12/16/10	Reference:	GJO-HGLP 1.6.3, Rev. 0

The pre- and post-survey verification measurements met the acceptance criteria for the established systems.

A casing correction for 9/16-in. casing was applied during analysis from ground surface to 43 ft, a combined casing correction for 1-in. thick casing (10 7/8-in. and 9 5/8-in. casing, respectively) from 43-46 ft, and a casing correction for 7/16-in. casing was applied during analysis from 47-110 ft with the bottom 3 ft of the borehole uncorrected.

A water correction was applied from 32.2 ft to the total logged depth of the borehole.

SGLS spectra were processed in batch mode in APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated in EXCEL template identified as DN20100125, using efficiency functions and corrections for casing and dead time as determined by the systems' annual calibration.

During routine processing of gamma spectra, regions of interest are forced at specific energy levels associated with natural and manmade radionuclides that are anticipated to be present. This processing approach sometimes results in an isolated "detection" near the Minimum Detection Level (MDL) resulting in a false positive. Where these detections occur, the individual spectrum is scrutinized and a determination is made regarding the validity of the detection. If the detection is deemed not representative of a full energy peak, or if confirming peaks are not detected, it is removed from the data set. The integrity of the raw data files and the processed files are maintained should questions arise in the future regarding these determinations.

NMLS data are represented in counts per second (cps) because no calibration data exists for 12-in. and 10-in. diameter boreholes.

The Hanford Gamma Unit (HGU) is an empirical unit of gamma activity proposed as a means to standardize gamma log response across multiple logging systems with different response characteristics. The HGU is defined in terms of measurements in the Hanford Borehole Calibration Facility, and the magnitude is selected such that 1 HGU is approximately equivalent to typical Hanford background activity, based on data from background samples as reported in *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12).

Results and Interpretations:

No manmade radionuclides were detected in this borehole. The MDL's for Cs-137, U-235 and U-238 are plotted on the Manmade Radionuclide plot.

The neutron moisture log primarily responds to moisture present in the surrounding formation. In general, an increase in count rate reflects an increase in moisture content. Moisture content may increase in sediments of relatively high silt or clay content. Casing joints may be altenuating gammas and neutrons from the detector at approximately 10-ft intervals.

The KUT and moisture repeat plots indicate that the respective systems were working properly.

List of Plots:

Depth reference is ground surface

Manmade Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma & Dead Time
Total Gamma & Moisture
Total Gamma & Hanford Gamma Unit
Repeat Section of Natural Gamma Logs
Moisture Repeat Section

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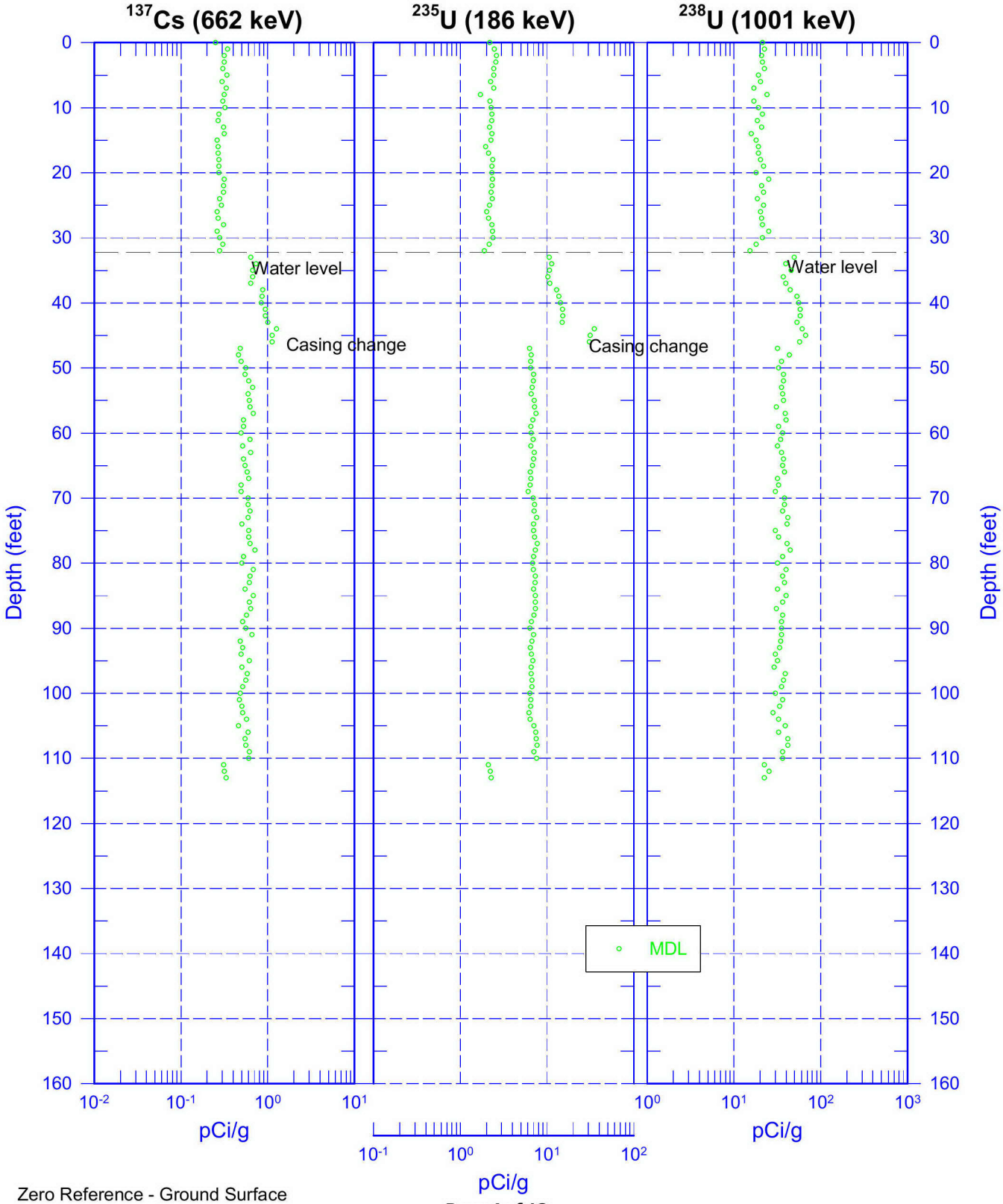
[1] GWL – groundwater level

HGLP-LDR-530, Rev. 0

Stoller Hanford Office

399-1-54 (C7653)
Manmade Radionuclides

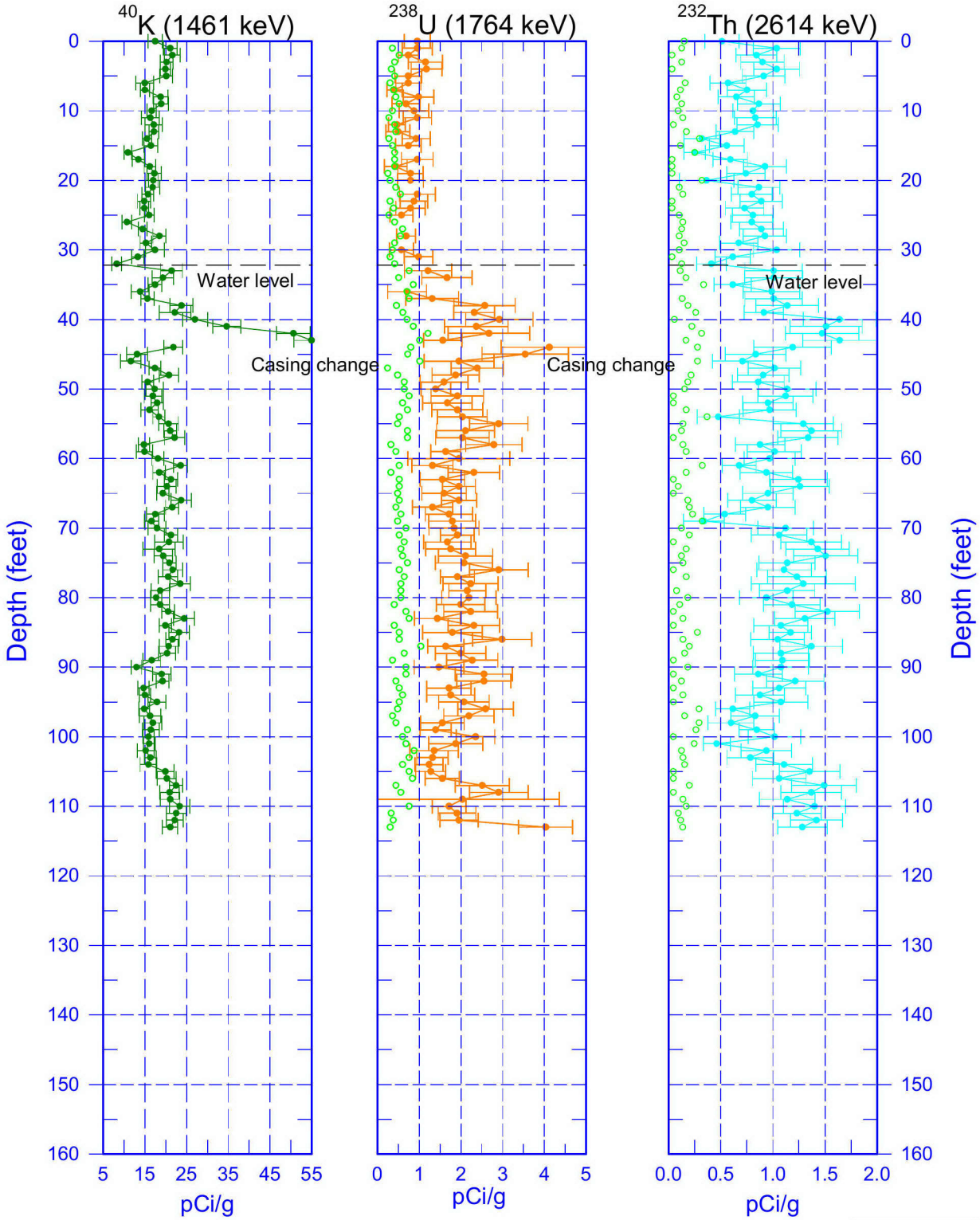


Zero Reference - Ground Surface

Stoller Hanford Office

HGLP-LDR-530, Rev. 0

399-1-54 (C7653)
Natural Gamma Logs

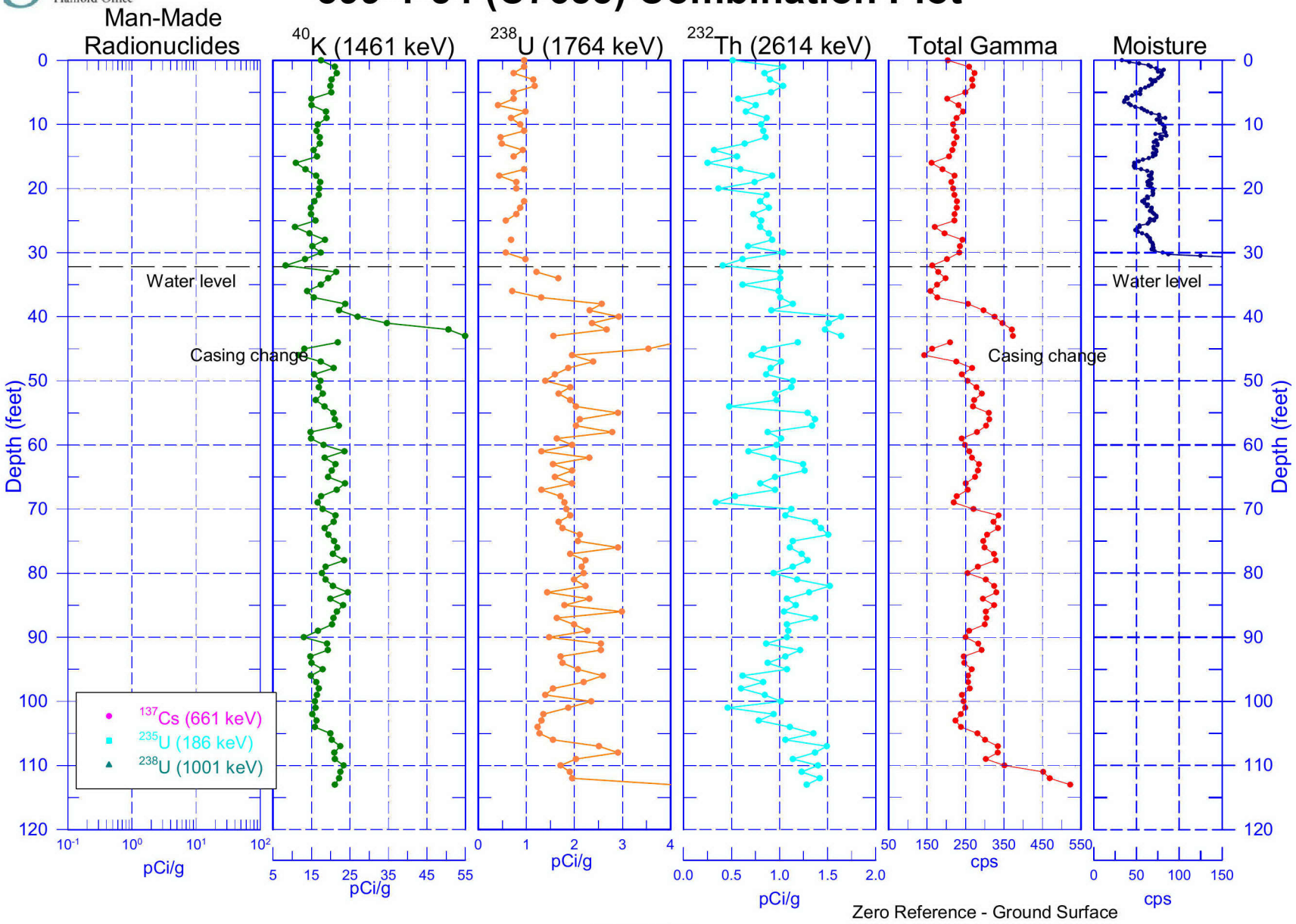


Zero Reference - Ground Surface

Stoller
Hanford Office

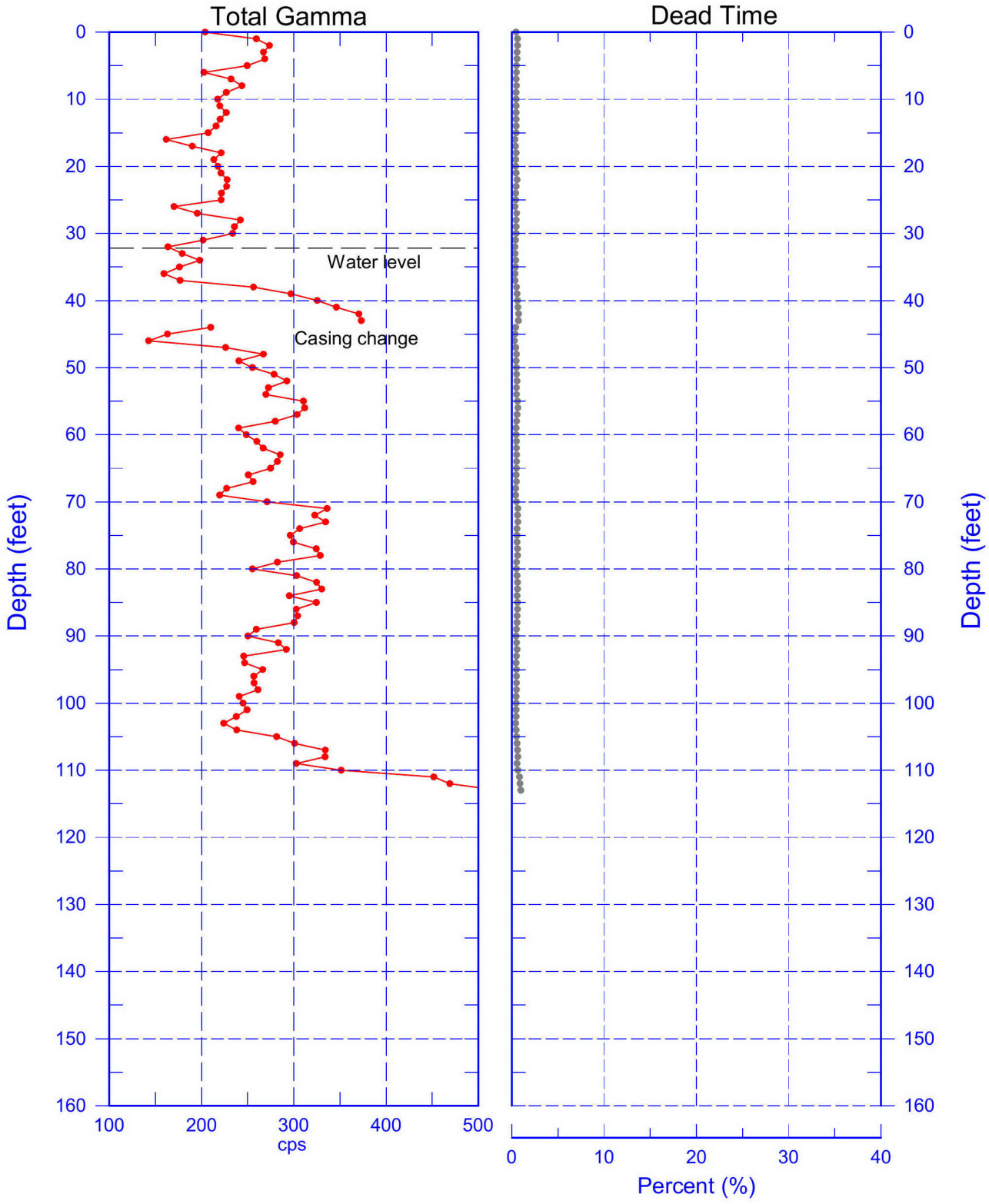
HGLP-LDR-530, Rev. 0

399-1-54 (C7653) Combination Plot



Stoller
Hanford Office

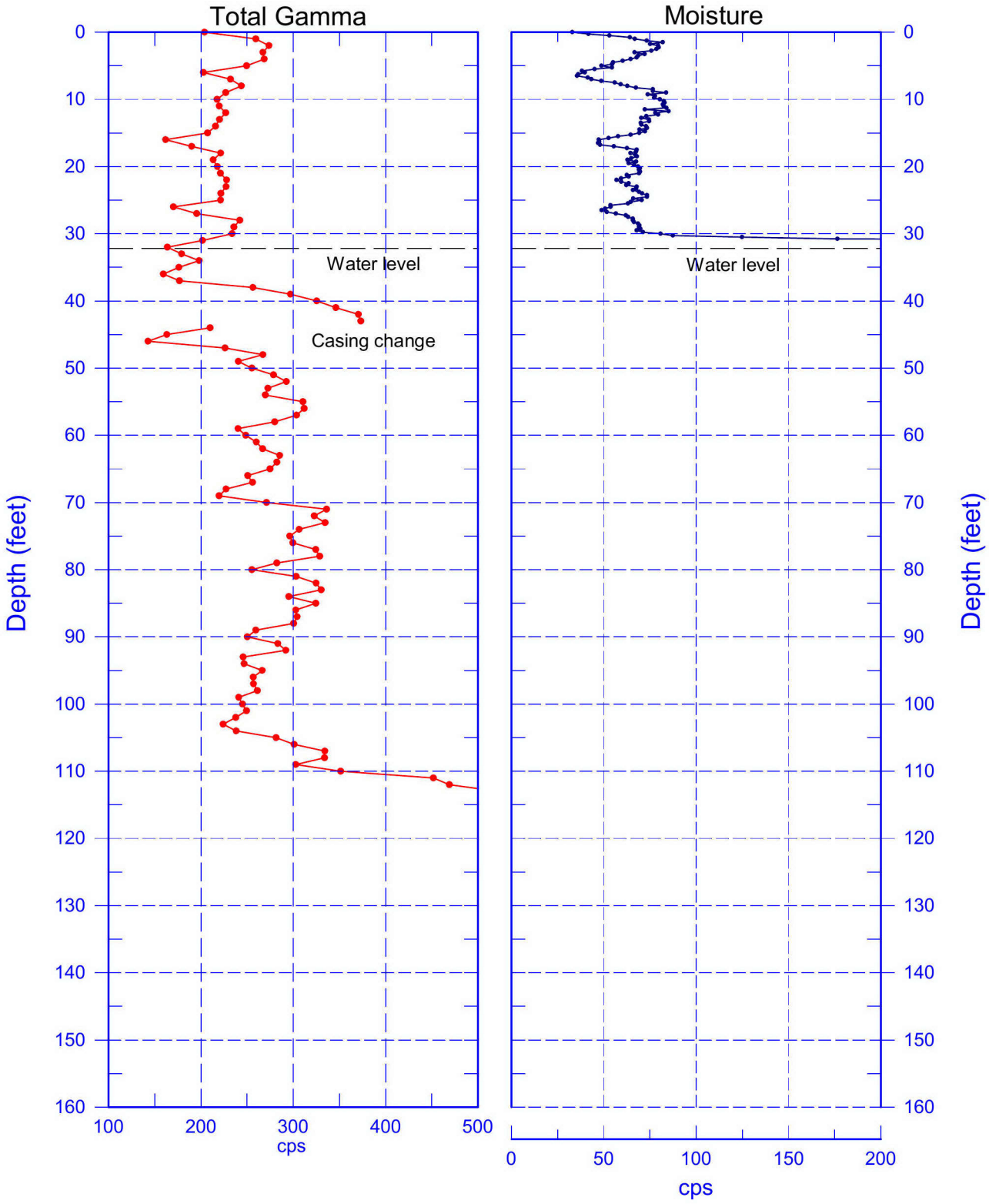
399-1-54 (C7653)
Total Gamma & Dead Time



Reference - Ground Surface

Stoller
Hanford Office

399-1-54 (C7653)
Total Gamma & Moisture

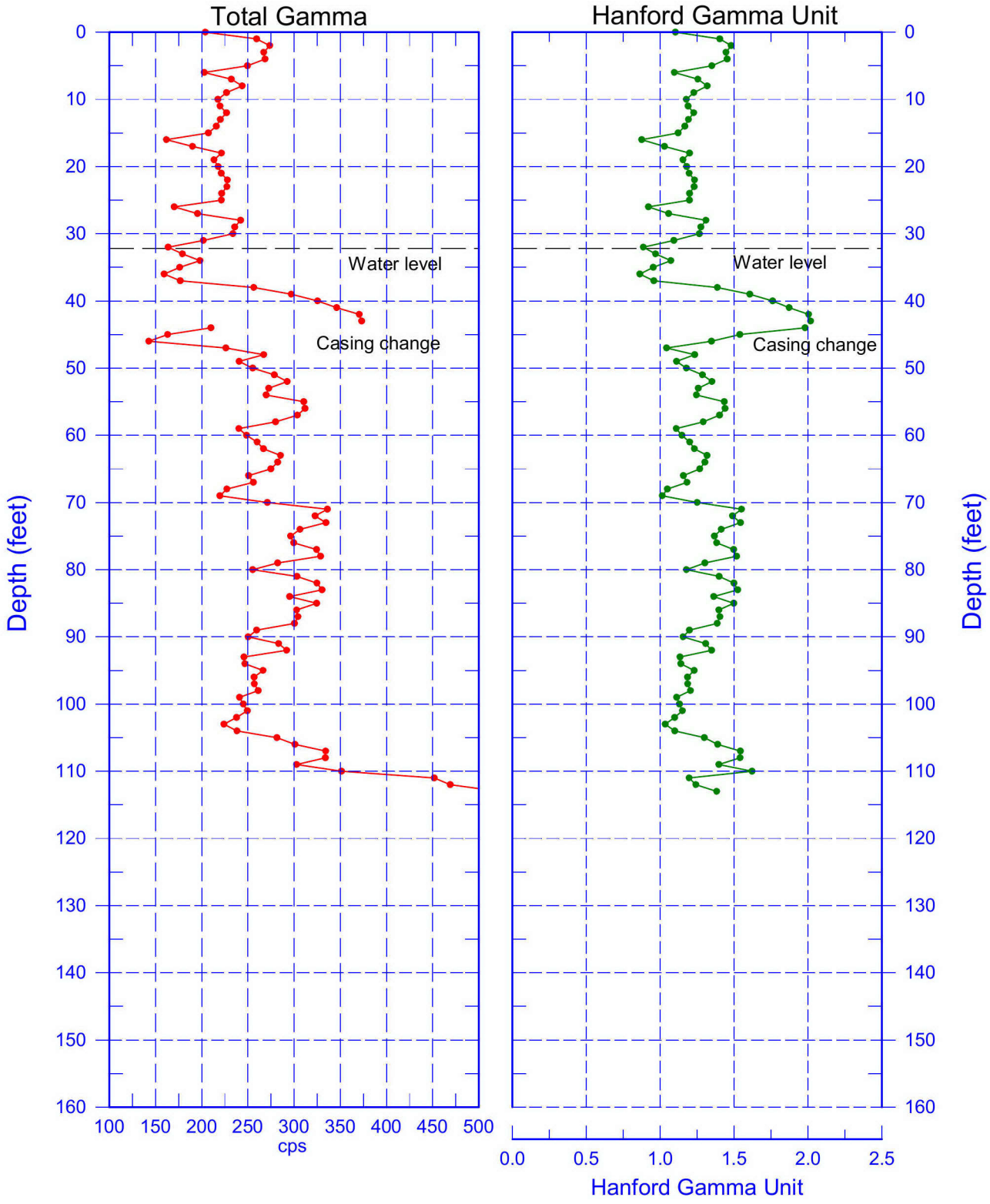


Reference - Ground Surface

Stoller Hanford Office

399-1-54 (C7653)

Total Gamma & Hanford Gamma Unit



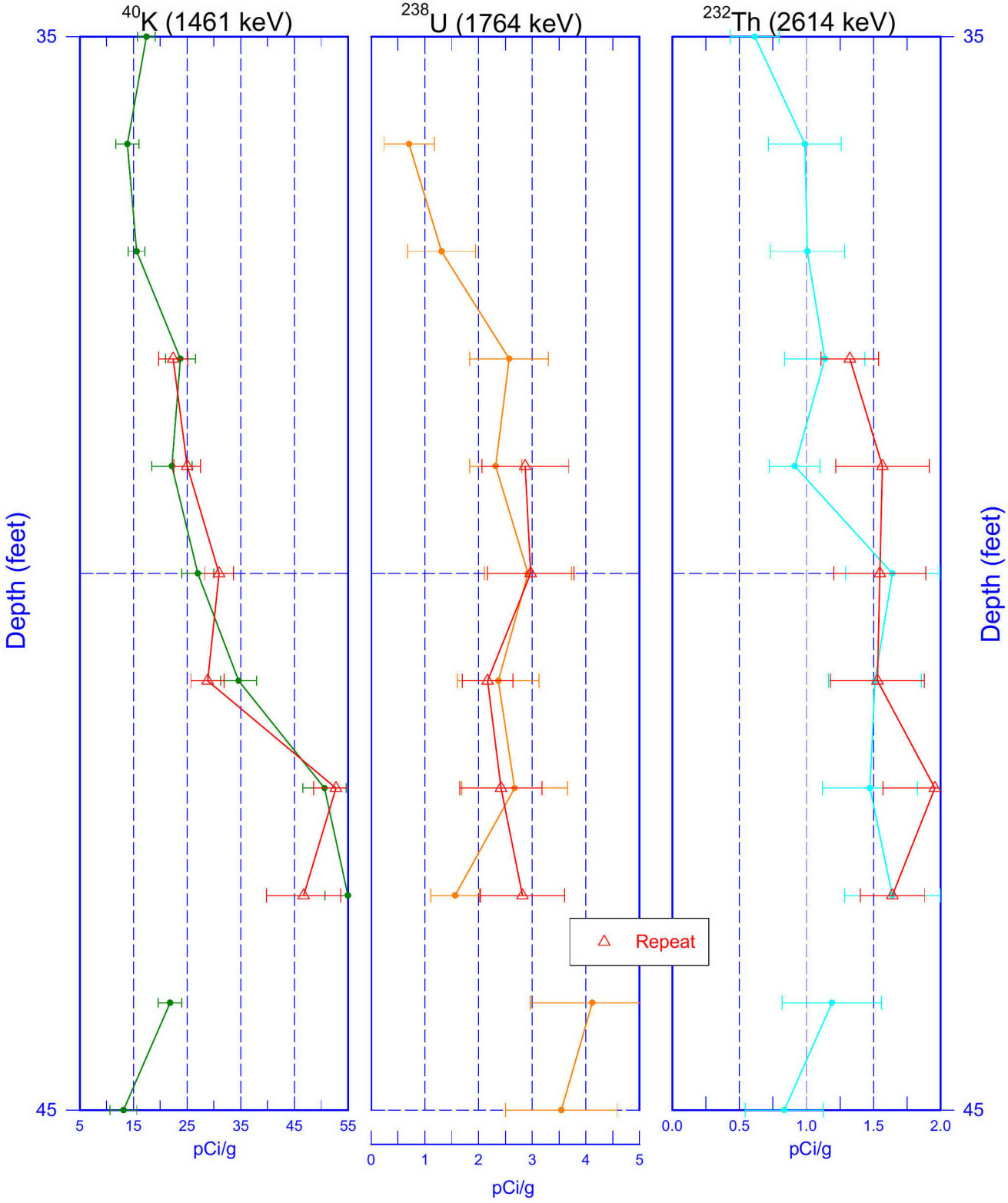
Reference - Ground Surface

HGLP-LDR-530, Rev. 0

Stoller Hanford Office

399-1-54 (C7653)

Repeat Section of Natural Gamma Logs

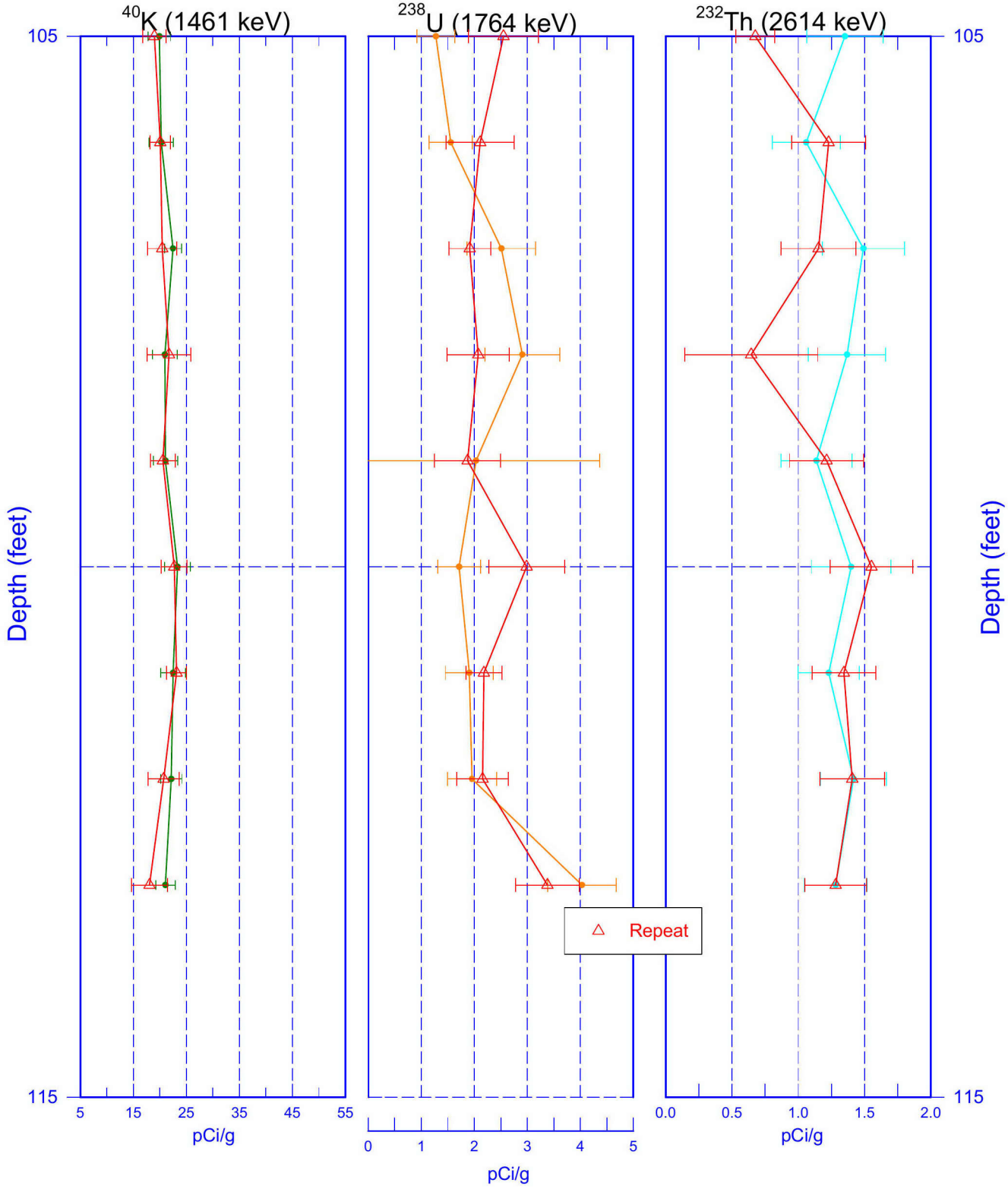


Zero Reference - Ground Surface

Stoller Hanford Office

399-1-54 (C7653)

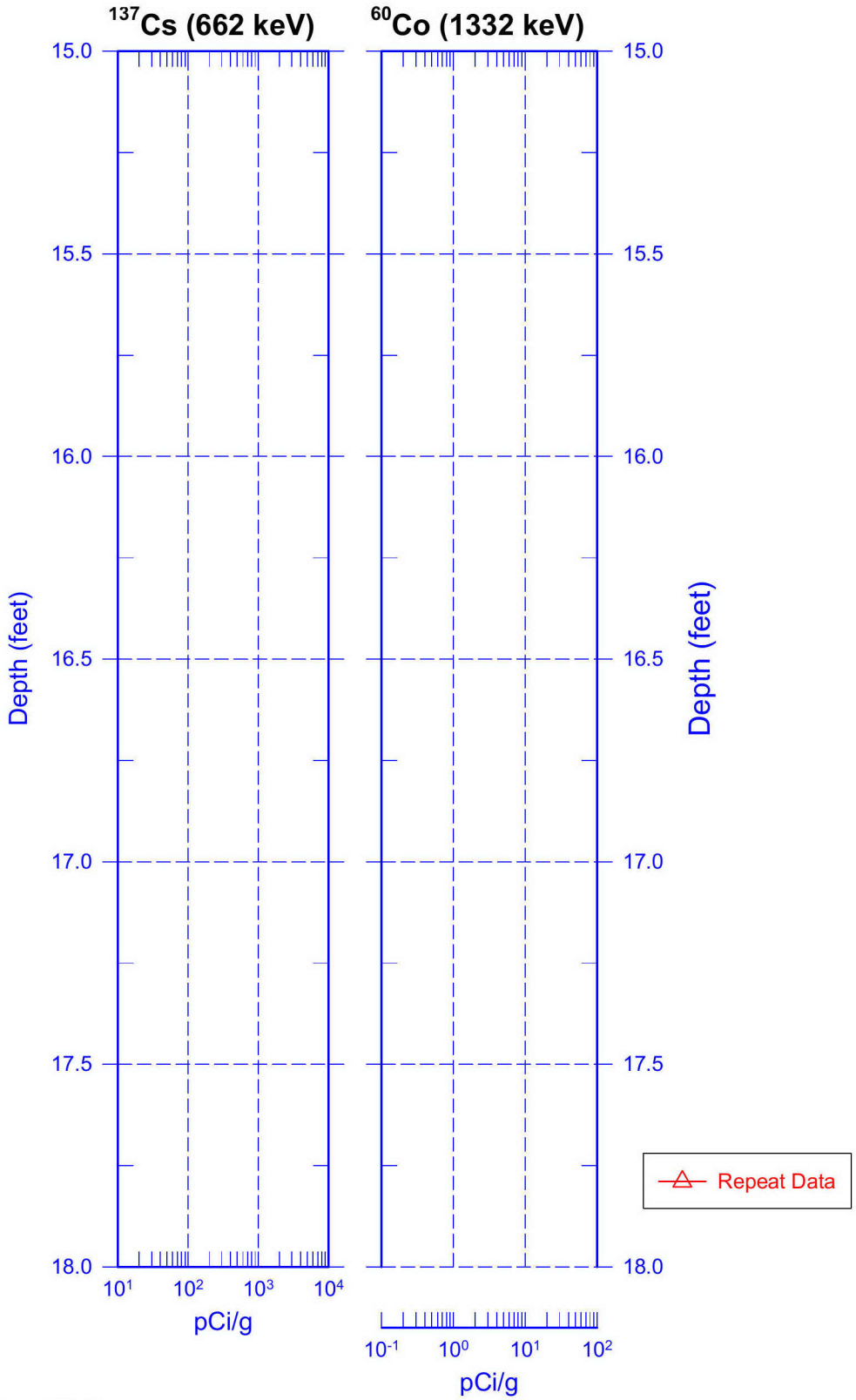
Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Stoller Hanford Office

C6765
Manmade Repeat Section



Zero Reference - Ground Surface

Stoller Hanford Office established 1959

HGLP-LDR-511, Rev. 0

399-1-55 (C7654)
Log Data Report

Borehole Information:

Borehole:	399-1-55 (C7654)		Site:	300-FF-5	
Coordinates (WA St Plane)		GWL[1] (ft) :	32.6	GWL Date:	08/30/10
North (m)	East (m)	Drill Date	TOC[2] Elevation	Total Depth (ft)	Type
Unknown	Unknown	08/27/10	Unknown	109	Sonic

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded Steel	2.9	12	10 7/8	9/16	2.9	46
Threaded Steel	2.8	10 1/2	9 3/4	3/8	2.8	106

Borehole Notes:

The Buyer's Technical Representative (BTR) provided depth of borehole and depth of casing. The logging engineer measured casing diameters (round to the nearest 1/16-in) and depth to water.

This borehole was logged in two (2) separate days, where each day represents logging in a single casing.

The zero reference is the ground surface.

Logging Equipment Information:

Logging System:	Gamma 1 N		Type: Serial No.:	60% HPGe SGLS 45-TP22010A
Effective Calibration Date:	05/05/10	Calibration Reference:	HGLP-CC-057, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Logging System:	Gamma 1 H		Type: Serial No.:	NMLS H310700352
Effective Calibration Date:	05/17/10	Calibration Reference:	HGLP-CC-058, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat	5	6 Repeat	
HEIS Number	1016984	1016985	1016986	1016987	
Date	08/23/10	08/23/10	08/30/10	08/30/10	
Logging Engineer	Pearson	Pearson	Pearson	Pearson	
Start Depth (ft)	43.0	4.0	108.0	57.0	
Finish Depth (ft)	0.0	0.0	42.0	50.0	
Count Time (sec)	100	100	100	100	
Live/Real	R	R	R	R	
Shield (Y/N)	N	N	N	N	
MSA Interval (ft)	1.0	1.0	1.0	1.0	
Log Speed (ft/min)	N/A	N/A	N/A	N/A	
Pre-Verification	AN164CAB	AN164CAB	AN165CAB	AN165CAB	
Start File	AN164000	AN164044	AN165000	AN165067	
Finish File	AN164043	AN164048	AN165066	AN165074	

Log Run	1	2 Repeat	5	6 Repeat	
Post-Verification	AN164CAA	AN164CAA	AN166CAA	AN166CAA	
Depth Return Error (in.)	1/2 High	1/2 High	N/A	1 Low	
Comments	No fine gain adjustments made.	No fine gain adjustments made.	No fine gain adjustments made.	No fine gain adjustments made.	

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	3	4 Repeat			
HEIS Number	1016988	1016989			
Date	08/23/10	08/23/10			
Logging Engineer	Pearson	Pearson			
Start Depth (ft)	0.0	29.0			
Finish Depth (ft)	32.25	32.0			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
Log Speed (ft/min)	N/A	N/A			
Pre-Verification	AH041CAB	AH041CAB			
Start File	AH041000	AH041130			
Finish File	AH041129	AH041142			
Post-Verification	AH041CAA	AH041CAA			
Depth Return Error (in.)	N/A	1/2 High			
Comments	None	None			

Logging Operation Notes:

SGLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the standard field verifier. A centralizer was installed on the sonde.

NMLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the standard field verifier. A centralizer was installed on the sonde.

Analysis Notes:

Analyst:	LEGLER	Date:	09/15/2010	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre- and post survey verification measurements met the acceptance criteria for the established systems.

A casing correction for 9/16-in. thick casing was applied from ground surface to 43 ft, a combined casing correction for 0.9375-in. thick casing (10 7/8-in. and 9 3/4-in. casing, respectively) from 44 to 46 ft, and a casing correction for a 3/8-in. thick casing was applied during analysis from 47 ft to 106 ft with the bottom 2ft of the borehole uncorrected.

A water correction was applied from 33.5 ft to the total logged depth of the borehole.

SGLS spectra were processed in batch mode in APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated on EXCEL templates identified as AN20100505, using an efficiency function, corrections for casing and dead time as determined by annual calibrations.

During routine processing of gamma spectra, regions of interest are forced at specific energy levels associated with natural and anmade adionuclides that can be anticipated to be present. This processing approach sometimes results in an isolated “detection” near the Minimum Detection Level (MDL) resulting in a false positive. Where these detections occur, the individual spectrum is scrutinized and a determination is made regarding the validity of the

detection. If the detection is deemed not representative of a full energy peak, or if confirming peaks are not detected, it is removed from the data set. The integrity of the raw data files and the processed files are maintained should questions arise in the future regarding these determinations.

The neutron moisture log data presented in counts per second (cps) as there is no calibration available for a 10 7/8-in. borehole.

The Hanford Gamma Unit (HGU) is an empirical unit of gamma activity proposed as a means to standardize gamma log response across multiple logging systems with different response characteristics. The HGU is defined in terms of measurements in the Hanford Borehole Calibration Facility, and the magnitude is selected such that 1 HGU is approximately equivalent to typical Hanford background activity, based on data from background samples as reported in *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12).

Results and Interpretations:

Manmade uranium (Pa-234m) was detected at 18, 19 and 24 ft at or near its MDL. Although not detected, MDLs for Cs-137 and U-235 are also plotted.

The neutron moisture log primarily responds to moisture present in the surrounding formation. In general, an increase in count rate reflects an increase in moisture content. Moisture content may increase in sediments of relatively high silt or clay content.

The repeat plots indicate that the respective systems were working properly.

List of Log Plots:

Depth Reference is ground surface

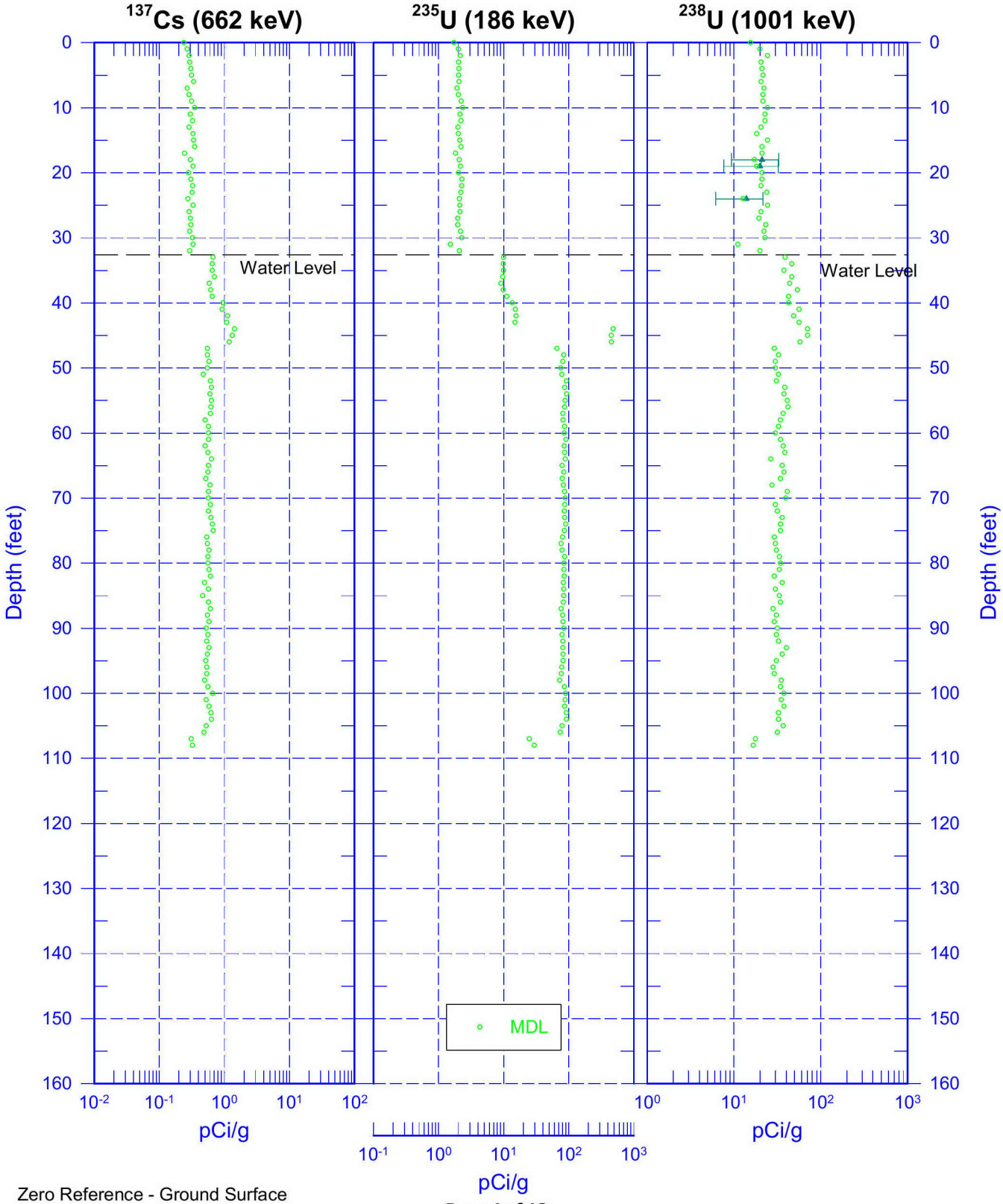
Manmade Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma & Dead Time
Total Gamma & Moisture
Total Gamma & Hanford Gamma Unit
Repeat Section of Manmade Radionuclides
Repeat Section of Natural Gamma Logs (2 pages)
Moisture Repeat Section

[1] GWL – groundwater level
[2] TOC – top of casing

HGLP-LDR-511, Rev. 0

Stoller Hanford Office

399-1-55 (C7654)
Manmade Radionuclides

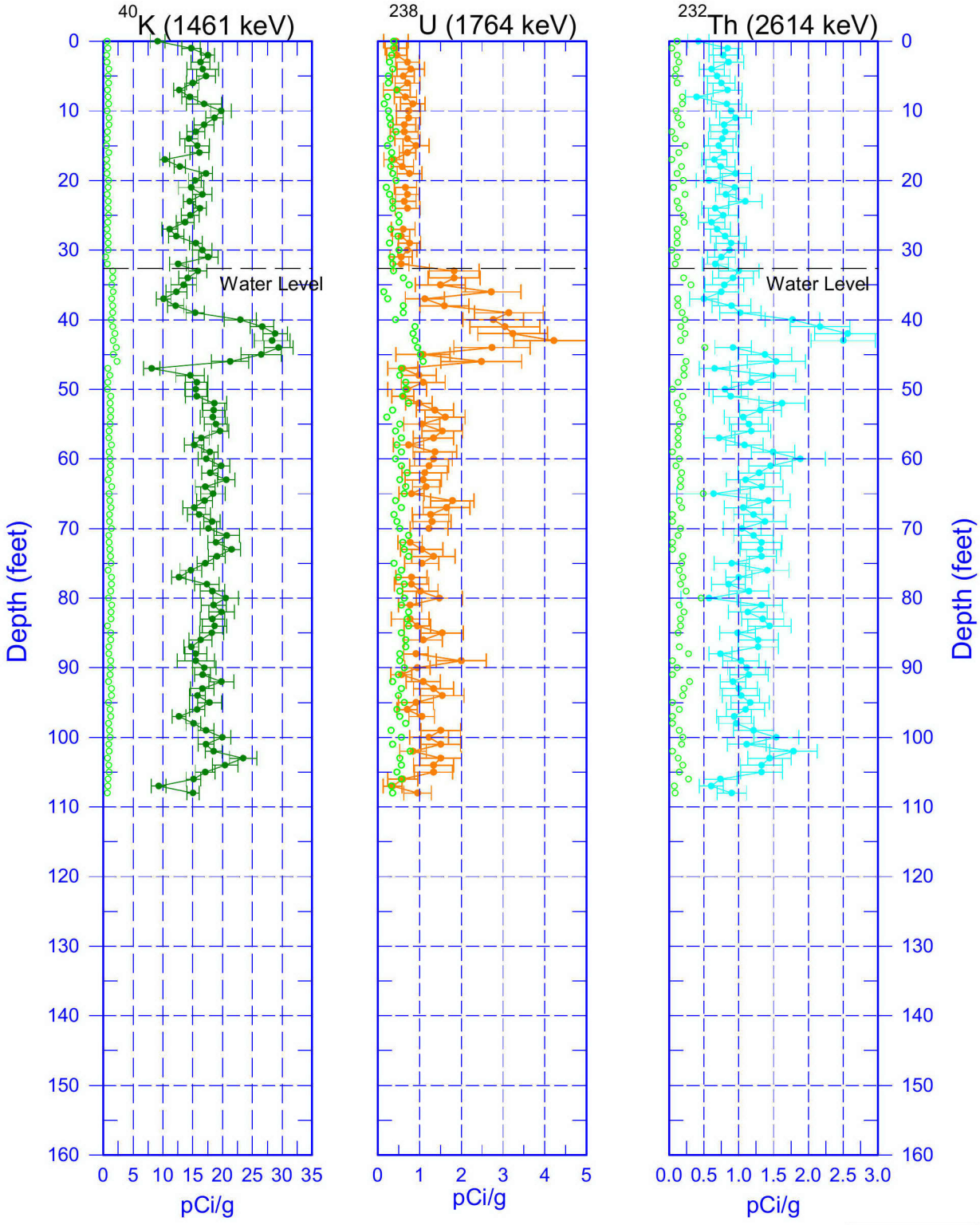


Zero Reference - Ground Surface

Stoller Hanford Office

HGLP-LDR-511, Rev. 0

399-1-55 (C7654)
Natural Gamma Logs

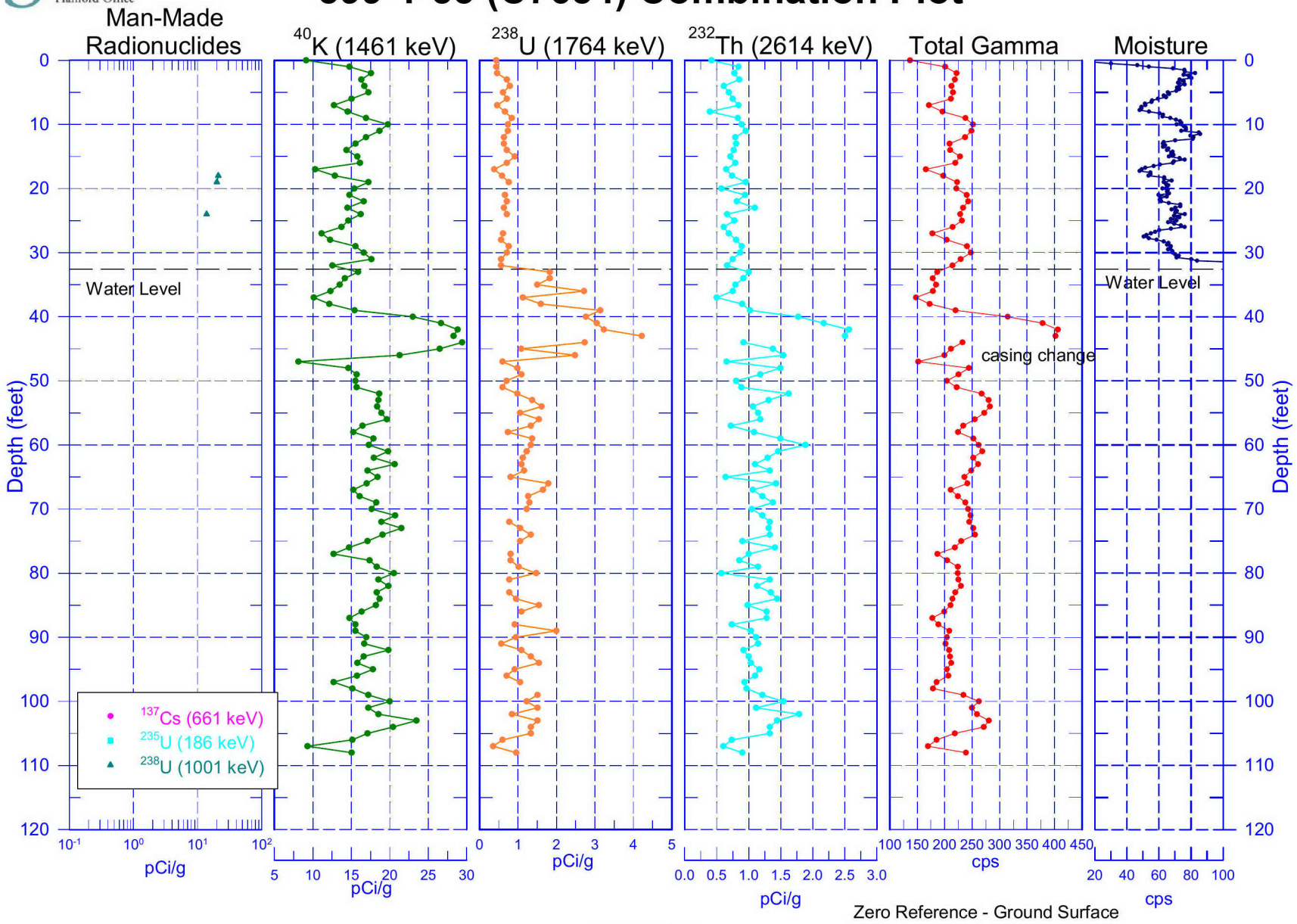


Zero Reference - Ground Surface

Stoller
Hanford Office

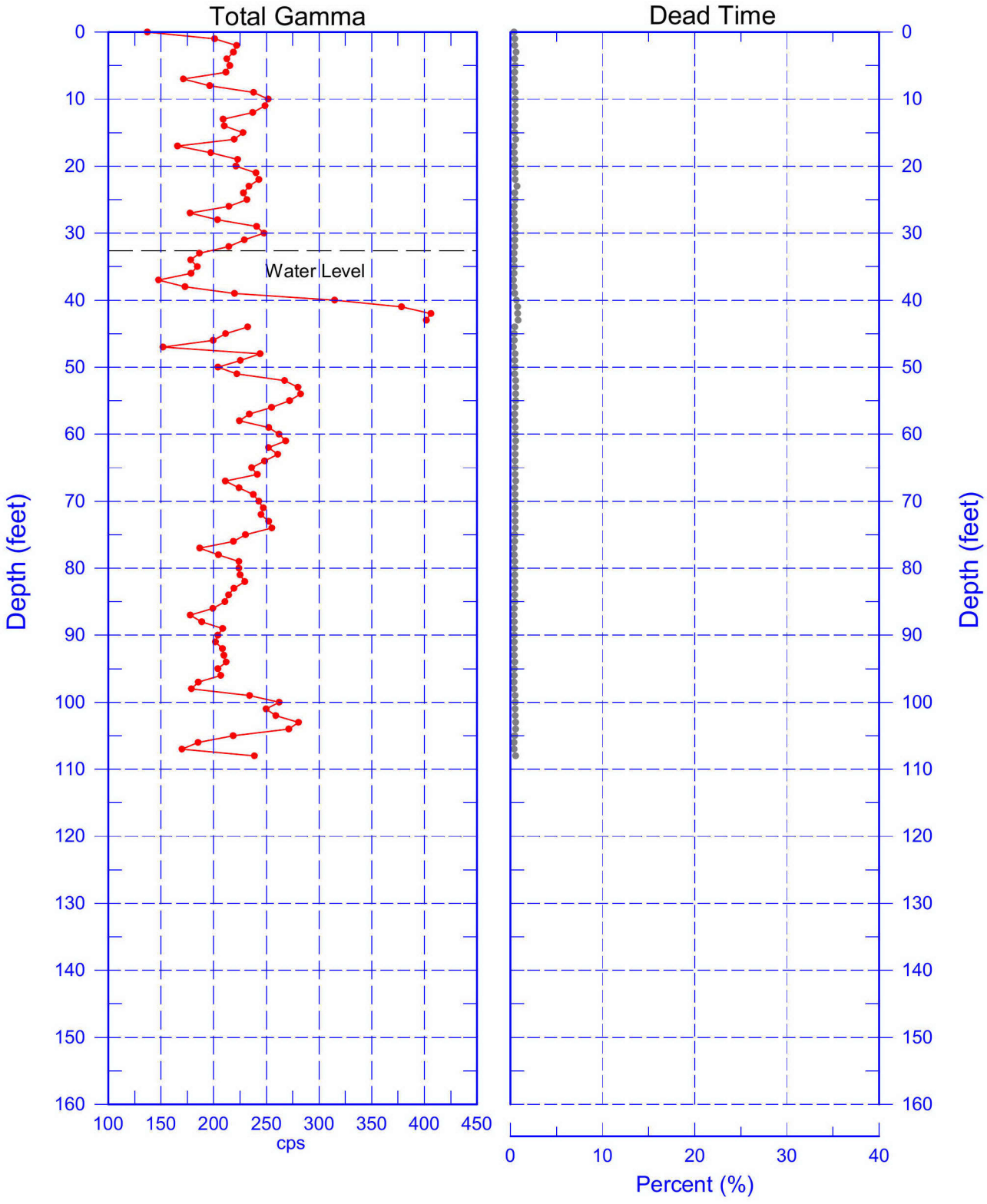
HGLP-LDR-511, Rev. 0

399-1-55 (C7654) Combination Plot



Stoller
Hanford Office

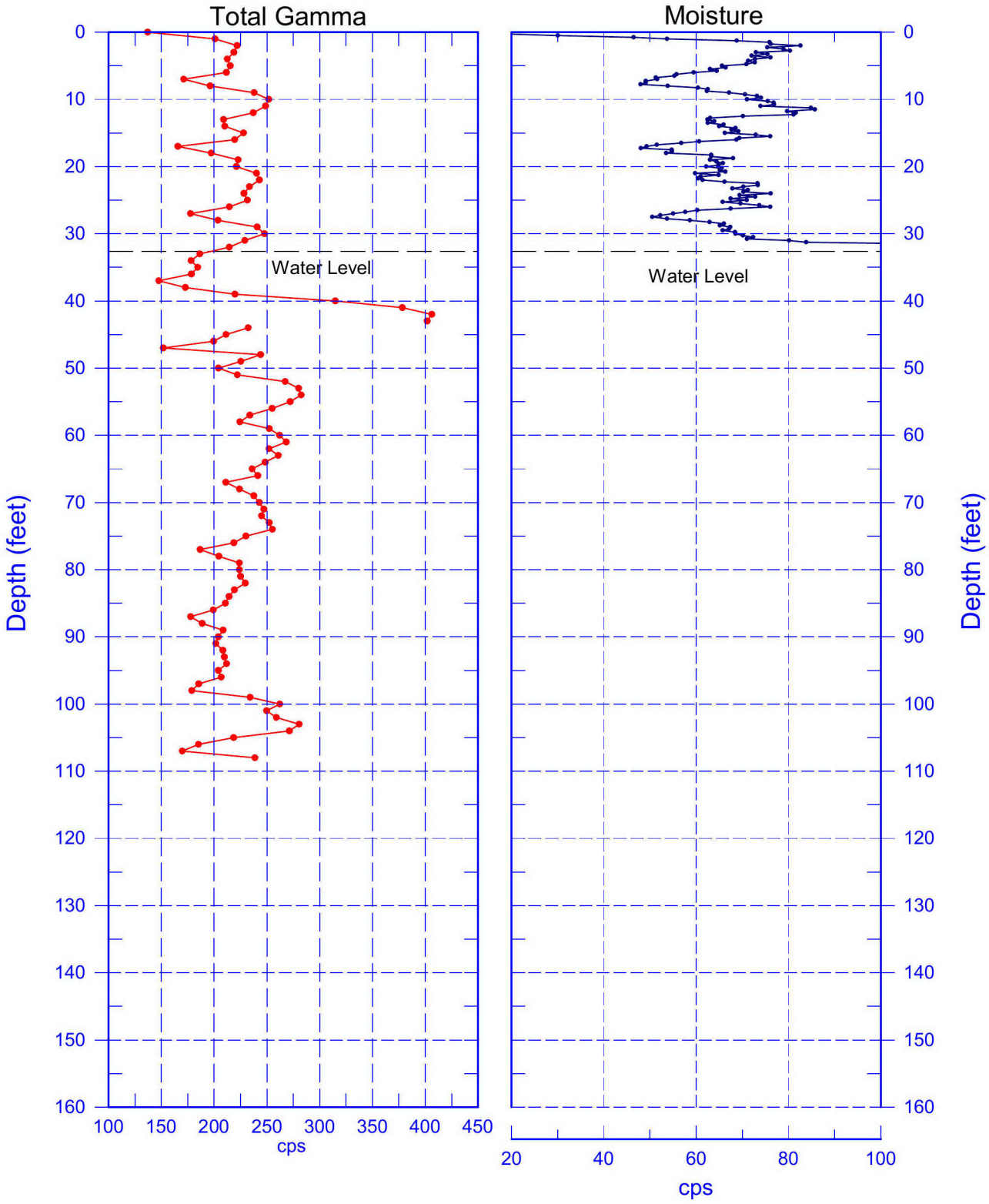
399-1-55 (C7654)
Total Gamma & Dead Time



Reference - Ground Surface

Stoller
Hanford Office

399-1-55 (C7654)
Total Gamma & Moisture

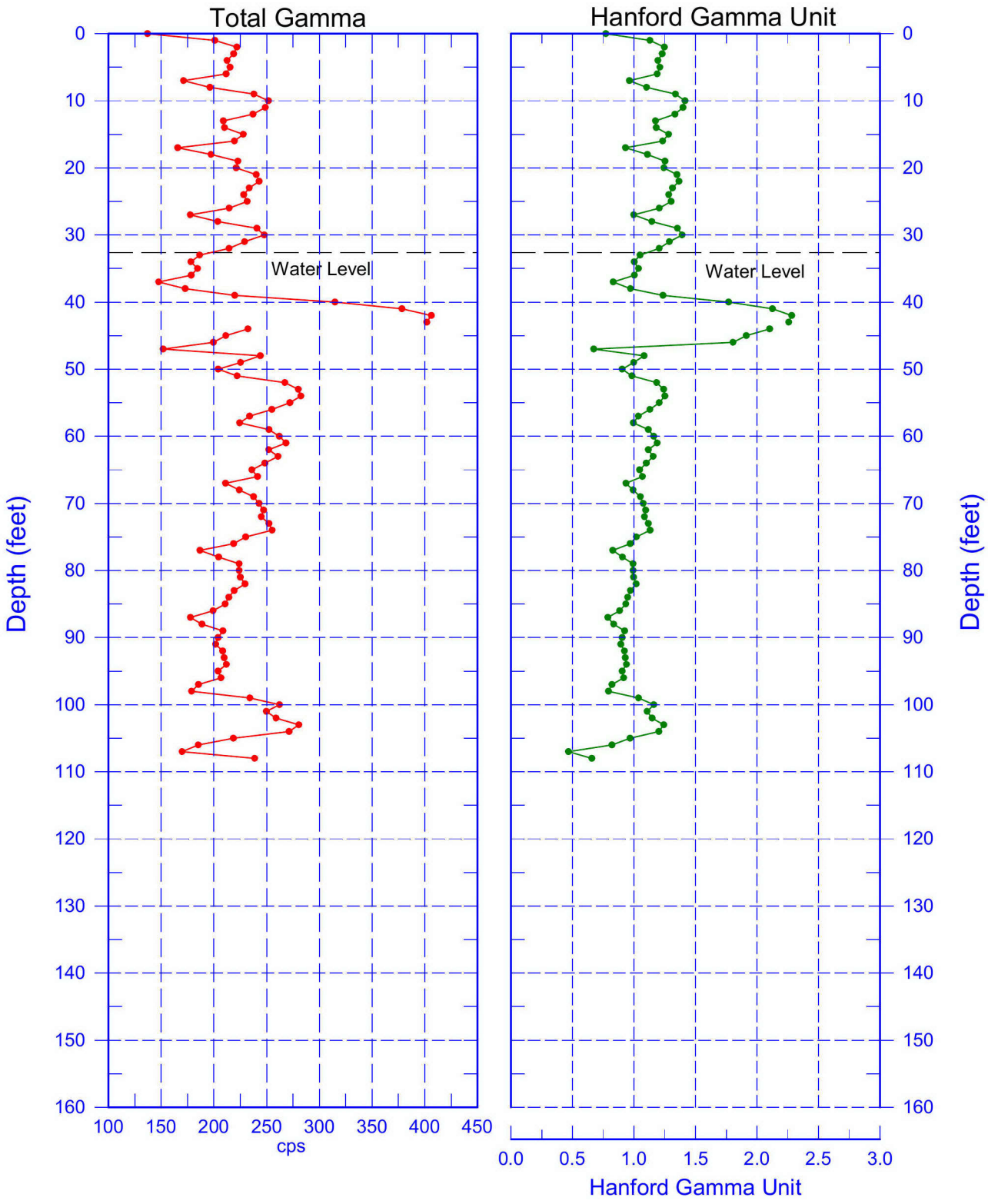


Reference - Ground Surface

Stoller Hanford Office

399-1-55 (C7654)

Total Gamma & Hanford Gamma Unit

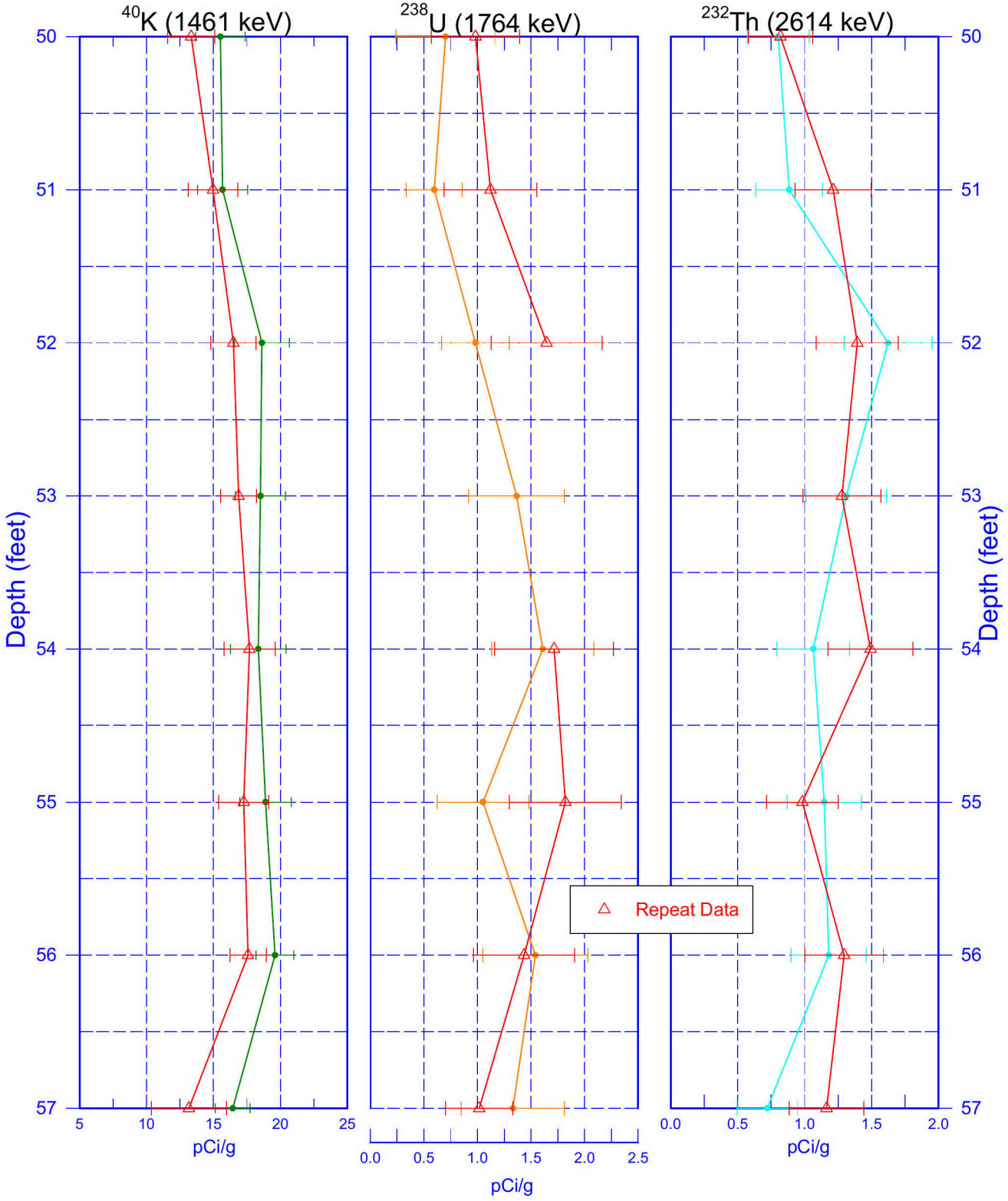


Reference - Ground Surface

Stoller Hanford Office

399-1-55 (C7654)

Repeat Section of Natural Gamma Logs

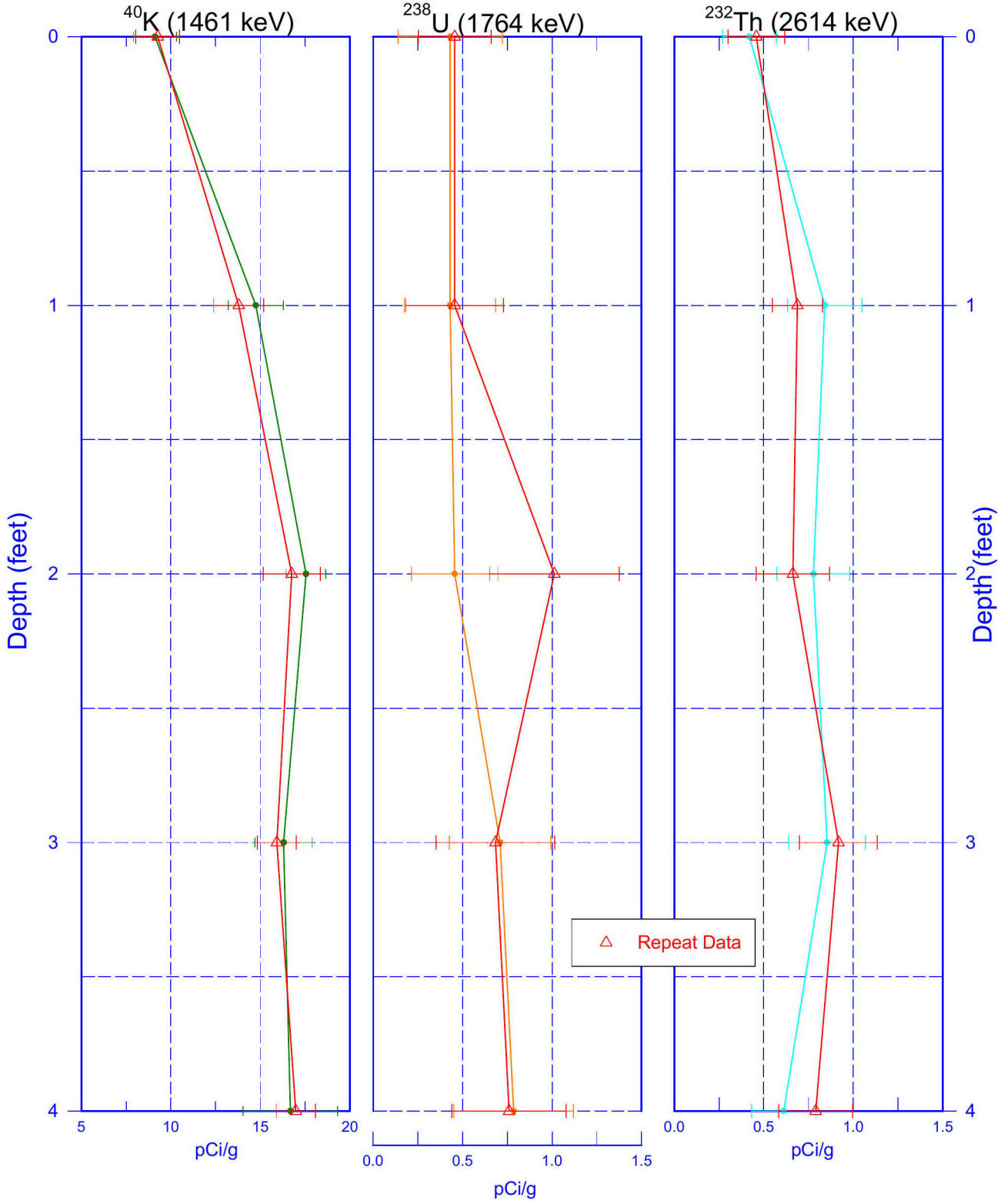


Zero Reference - Ground Surface

Stoller Hanford Office

399-1-55 (C7654)

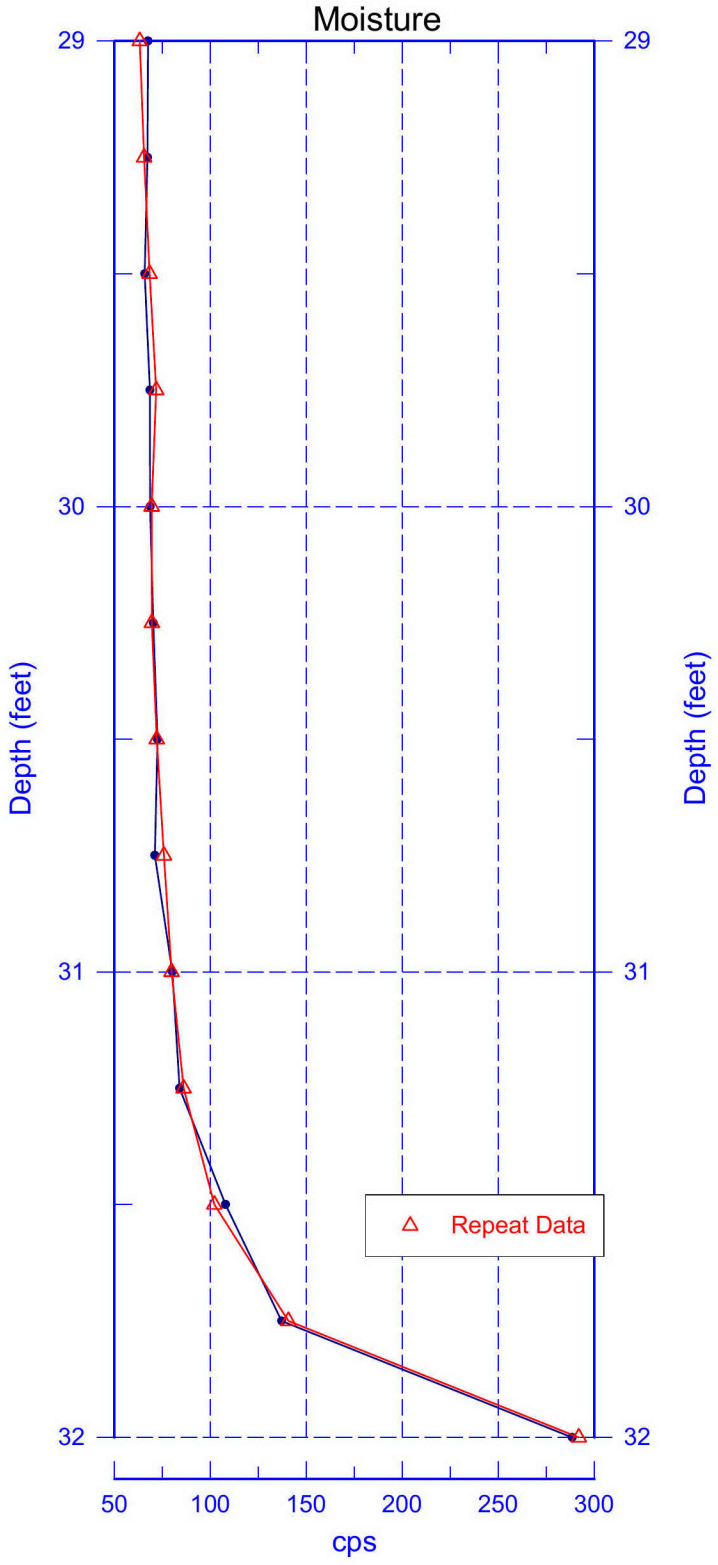
Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Stoller
Hanford Office

399-1-55 (C7654)
Moisture Repeat Section



Reference - Ground Surface

Stoller Hanford Office established 1959

HGLP-LDR-529, Rev. 0

399-1-56 (C7655)
Log Data Report

Borehole Information:

Borehole:	399-1-56 (C7655)		**Site:**	300-FF-5	
Coordinates (WA St Plane)		**GWL[1] (ft):**	31.8	**GWL Date:**	09/21/10
North (m)	**East (m)**	**Drill Date**	**TOC[2] Elevation**	**Total Depth (ft)**	**Type**
Unknown	Unknown	09/21/10	Unknown	117	Sonic

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded Steel	3.5	12	10 7/8	9/16	3.5	46.5
Threaded Steel	3.3	Unknown	9 5/8	1/2	3.3	117.0

Borehole Notes:

The Buyer's Technical Representative (BTR) provided the depth of casing and total depth of borehole. The logging engineer measured casing diameters (rounded to the nearest 1/16-in.), depth to water and casing stick-up.

The zero reference is the ground surface.

Logging Equipment Information:

Logging System:	Gamma 1 N		**Type:**	60% HPGe SGLS
			Serial No.:	45-TP22010A
Effective Calibration Date:	05/05/10	**Calibration Reference:**	HGLP-CC-057, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Logging System:	Gamma 1 H		**Type:**	NMLS
			Serial No.:	H310700352
Effective Calibration Date:	05/17/10	**Calibration Reference:**	HGLP-CC-058, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat	5	6 Repeat	
HEIS Number	1017013	1017014	1017015	1017016	
Date	09/16/10	09/16/10	09/21/10	09/21/10	
Logging Engineer	McClellan/ Holloway	McClellan/ Holloway	McClellan/ Holloway	McClellan/ Holloway	
Start Depth (ft)	0.0	40.0	45.0	45.0	
Finish Depth (ft)	46.0	45.0	116.0	52.0	
Count Time (sec)	100	100	100	100	
Live/Real	R	R	R	R	
Shield (Y/N)	N	N	N	N	
MSA Interval (ft)	1.0	1.0	1.0	1.0	
Log Speed (ft/min)	N/A	N/A	N/A	N/A	
Pre-Verification	AN168CAB	AN168CAB	AN169CAB	AN169CAB	
Start File	AN168000	AN168047	AN169000	AN169072	
Finish File	AN168046	AN168052	AN169071	AN169079	
Post-Verification	AN168CAA	AN168CAA	AN169CAA	AN169CAA	

Log Run	1	2 Repeat	5	6 Repeat	
Depth Return Error (in.)	N/A	0.0	N/A	1/2 Low	
Comments	No fine gain adjustments made.	No fine gain adjustments made.	No fine gain adjustments made.	No fine gain adjustments made.	

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	3	4 Repeat			
HEIS Number	1017017	1017018			
Date	09/16/10	09/16/10			
Logging Engineer	McClellan/ Holloway	McClellan/ Holloway			
Start Depth (ft)	0.0	27.0			
Finish Depth (ft)	31.5	31.5			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
Log Speed (ft/min)	N/A	N/A			
Pre-Verification	AH044CAB	AH044CAB			
Start File	AH044000	AH044127			
Finish File	AH044126	AH044145			
Post-Verification	AH044CAA	AH044CAA			
Depth Return Error (in.)	N/A	1/2 Low			
Comments	None	None			

Logging Operation Notes:

SGLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the KUTh-118 field verifier. A centralizer was installed on the sonde.

NMLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the AmBe standard field verifier. A centralizer was installed on the sonde.

Analysis Notes:

Analyst:	LEGLER	Date:	10/12/10	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre- and post survey verification measurements met the acceptance criteria for the established systems.

A casing correction for 9/16-in. thick casing was applied from ground surface to 46 ft, and a casing correction for a 1/2-in. thick casing was applied during analysis from 47 ft to 116 ft.

A water correction was applied from 31.8 ft to the total logged depth of the borehole.

SGLS spectra were processed in batch mode in APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated an EXCEL templates identified as AN20100505, using an efficiency function, corrections for casing and dead time as determined by annual calibrations.

During routine processing of gamma spectra, regions of interest are forced at specific energy levels associated with natural and manmade radionuclides that can be anticipated to be present. This processing approach sometimes results in an isolated “detection” near the Minimum Detection Level (MDL) resulting in a false positive. Where these detections occur, the individual spectrum is scrutinized and a determination is made regarding the validity of the detection. If the detection is deemed not representative of a full energy peak, or if confirming peaks are not

detected, it is removed from the data set. The integrity of the raw data files and the processed files are maintained should questions arise in the future regarding these determinations.

The neutron moisture log data are presented in counts per second (cps) as there is no calibration available for a 10 7/8-in. borehole.

The Hanford Gamma Unit (HGU) is an empirical unit of gamma activity proposed as a means to standardize gamma log response across multiple logging systems with different response characteristics. The HGU is defined in terms of measurements in the Hanford Borehole Calibration Facility, and the magnitude is selected such that 1 HGU is approximately equivalent to typical Hanford background activity, based on data from background samples as reported in *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12).

Results and Interpretations:

Cs-137 was detected almost continuously from 18 to 22 ft, with a maximum concentration of approximately 0.6 pCi/g at 21 ft. Although not detected, MDLs for U-235 and U-238 (Pa-234m) are plotted on the man made radionuclides plot.

Increasing K-40 and Th-232 concentrations indicate a charge in sediments at approximately 40 ft. Enhanced radon is indicated throughout the borehole. Significantly higher concentrations of radon are indicated in the upper portions of the groundwater from 31 to 50 ft. Spectral peaks indicate no evidence of processed uranium.

Slightly greater thickness at the casing joints is indicated by lower total gamma activity at 10 ft intervals.

The neutron moisture log primarily responds to moisture present in the surrounding formation. In general, an increase in count rate reflects an increase in moisture content. Moisture content may increase in sediments of relatively high silt or clay content. A fine-grained sediment layer may be present at 20 ft.

The repeat plots indicate that the respective systems were working properly.

List of Log Plots:

Depth Reference is ground surface

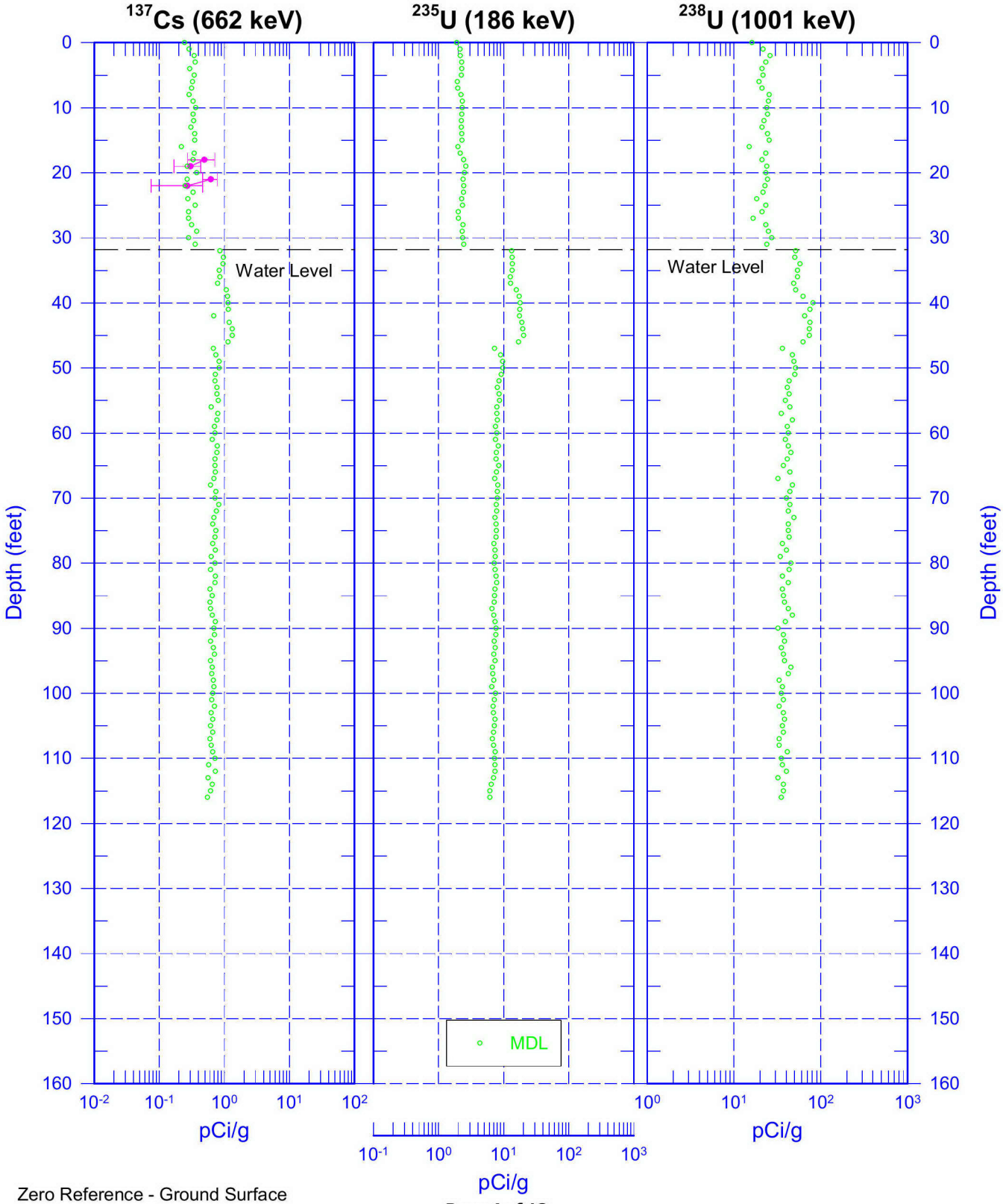
Manmade Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma & Dead Time
Total Gamma & Moisture
Total Gamma & Hanford Gamma Unit
Repeat Section of Natural Gamma Logs (2 pages)
Moisture Repeat Section

[1] GWL – groundwater level
[2] TOC – top of casing

HGLP-LDR-525, Rev. 0

Stoller Hanford Office

399-1-56 (C7655)
Manmade Radionuclides

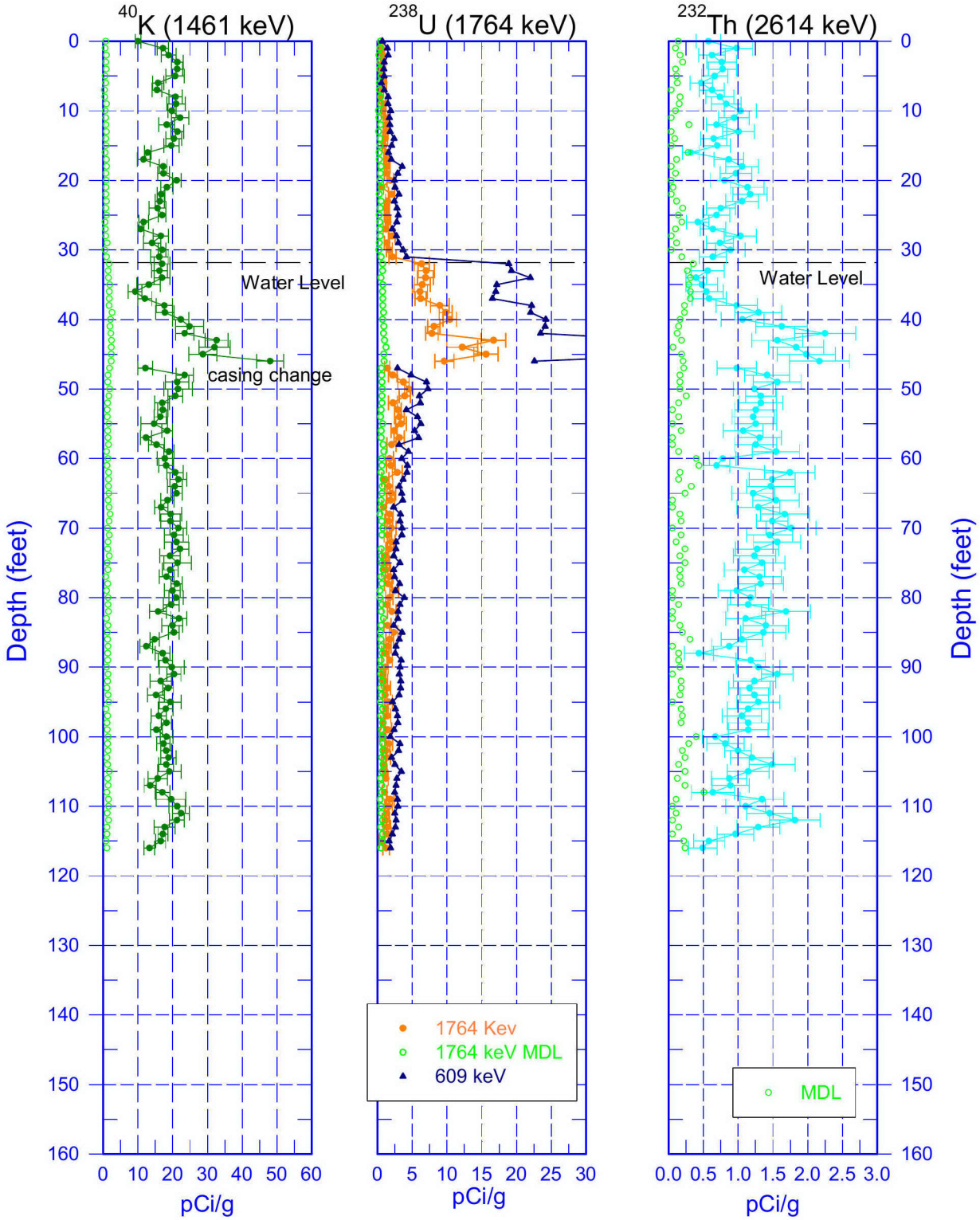


Zero Reference - Ground Surface

Stoller Hanford Office

HGLP-LDR-525, Rev. 0

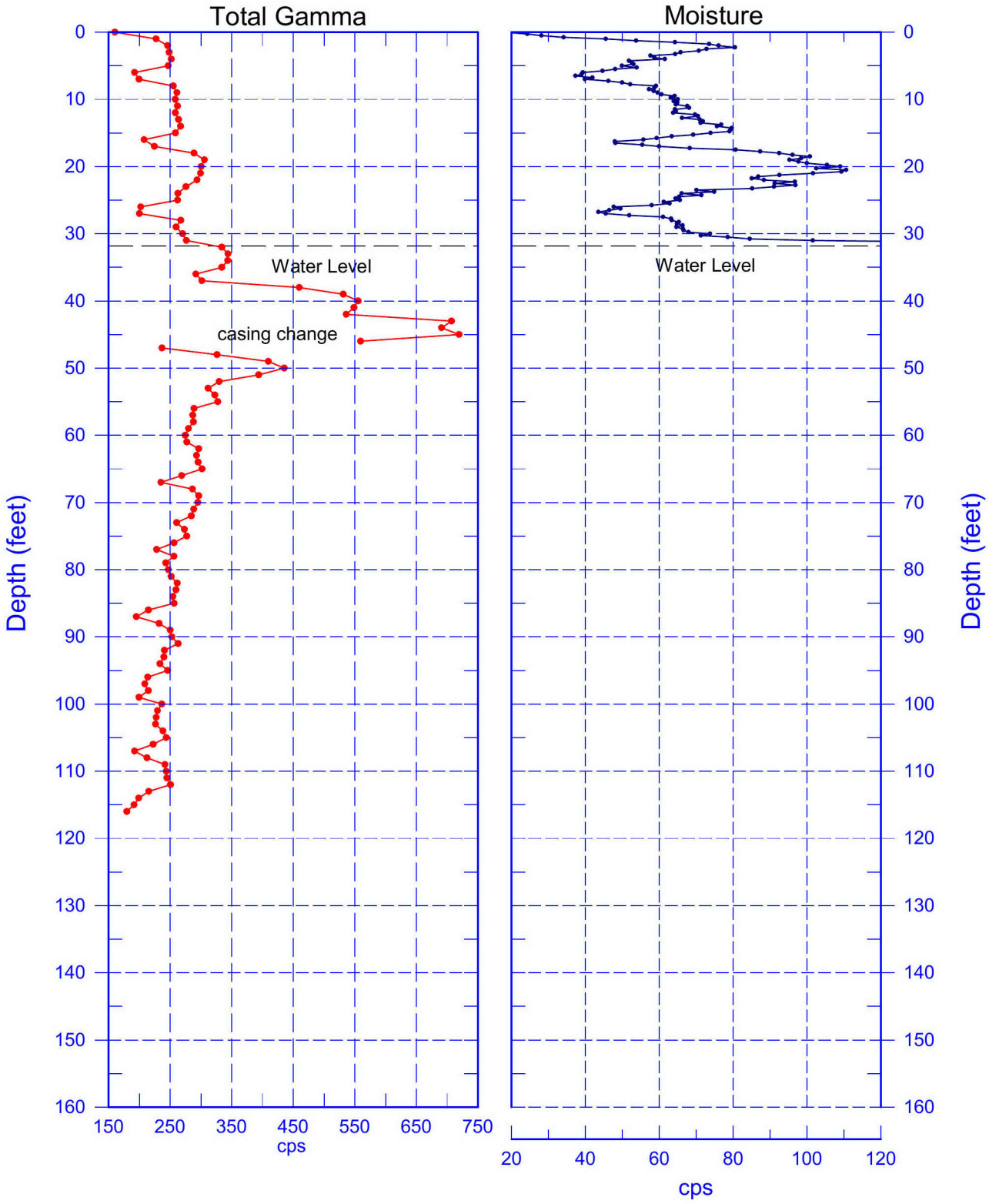
399-1-56 (C7655)
Natural Gamma Logs



Zero Reference - Ground Surface

Stoller
Hanford Office

399-1-56 (C7655)
Total Gamma & Moisture

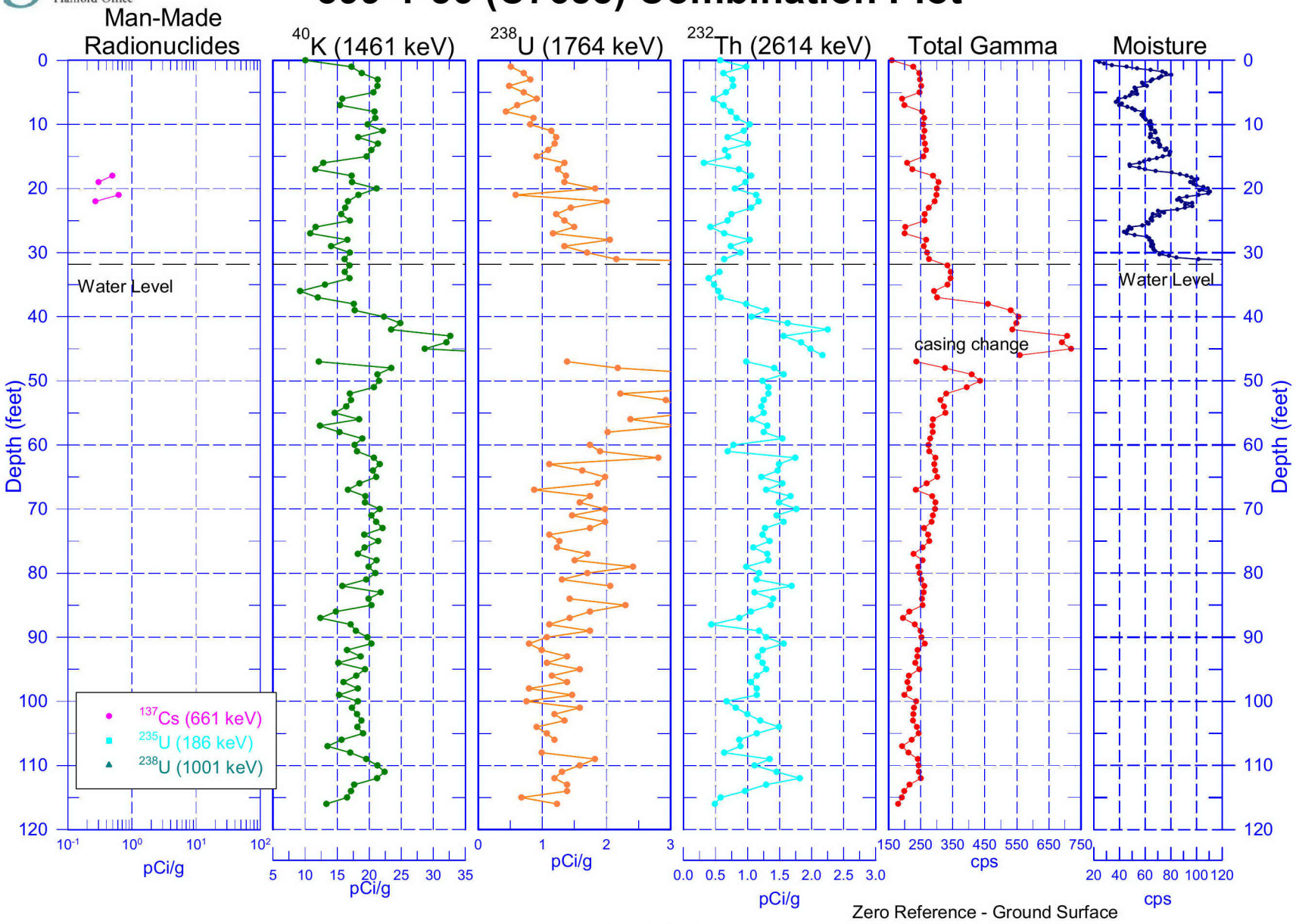


Reference - Ground Surface

Stoller
Hanford Office

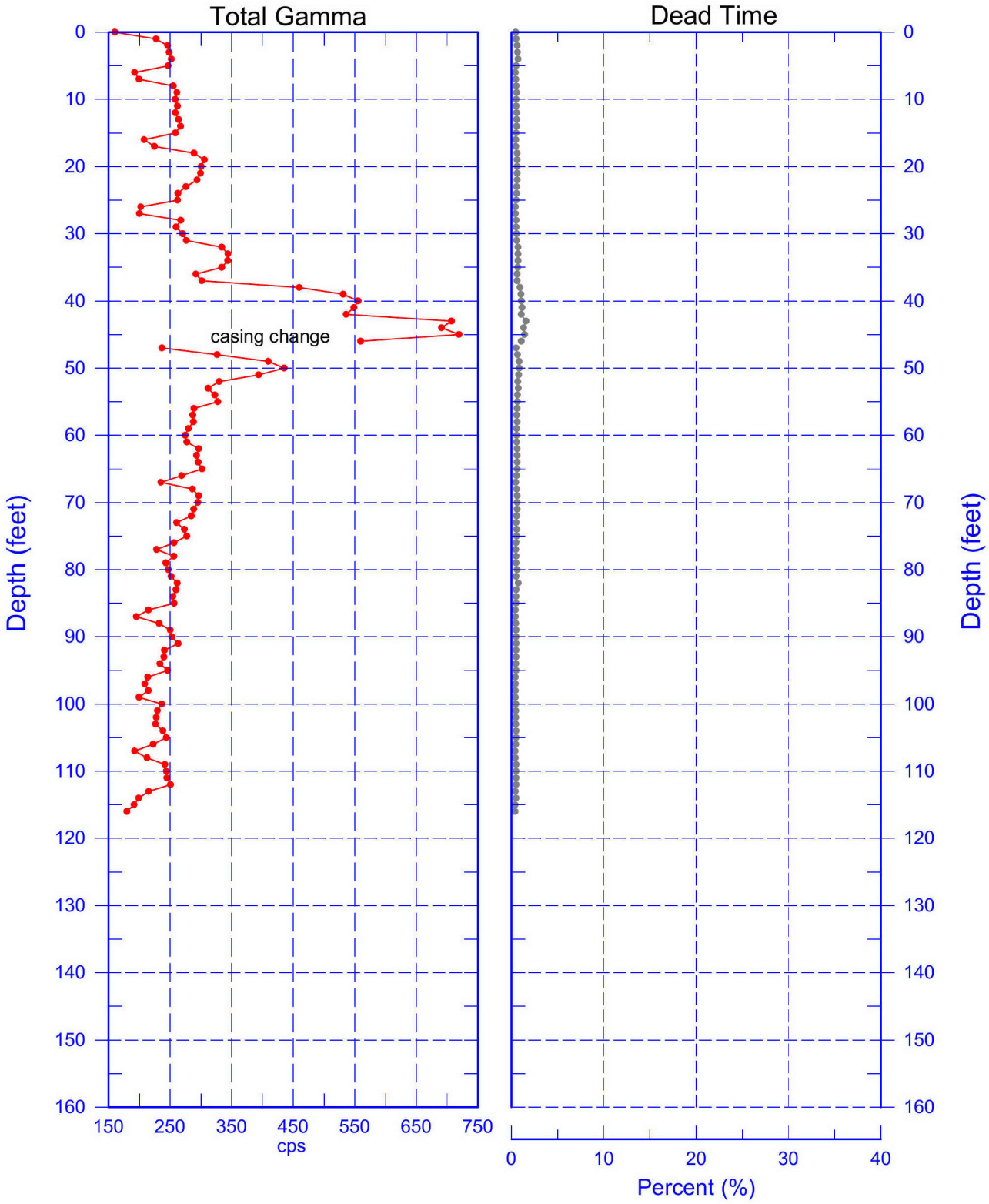
HGLP-LDR-525, Rev. 0

399-1-56 (C7655) Combination Plot



Stoller
Hanford Office

399-1-56 (C7655)
Total Gamma & Dead Time

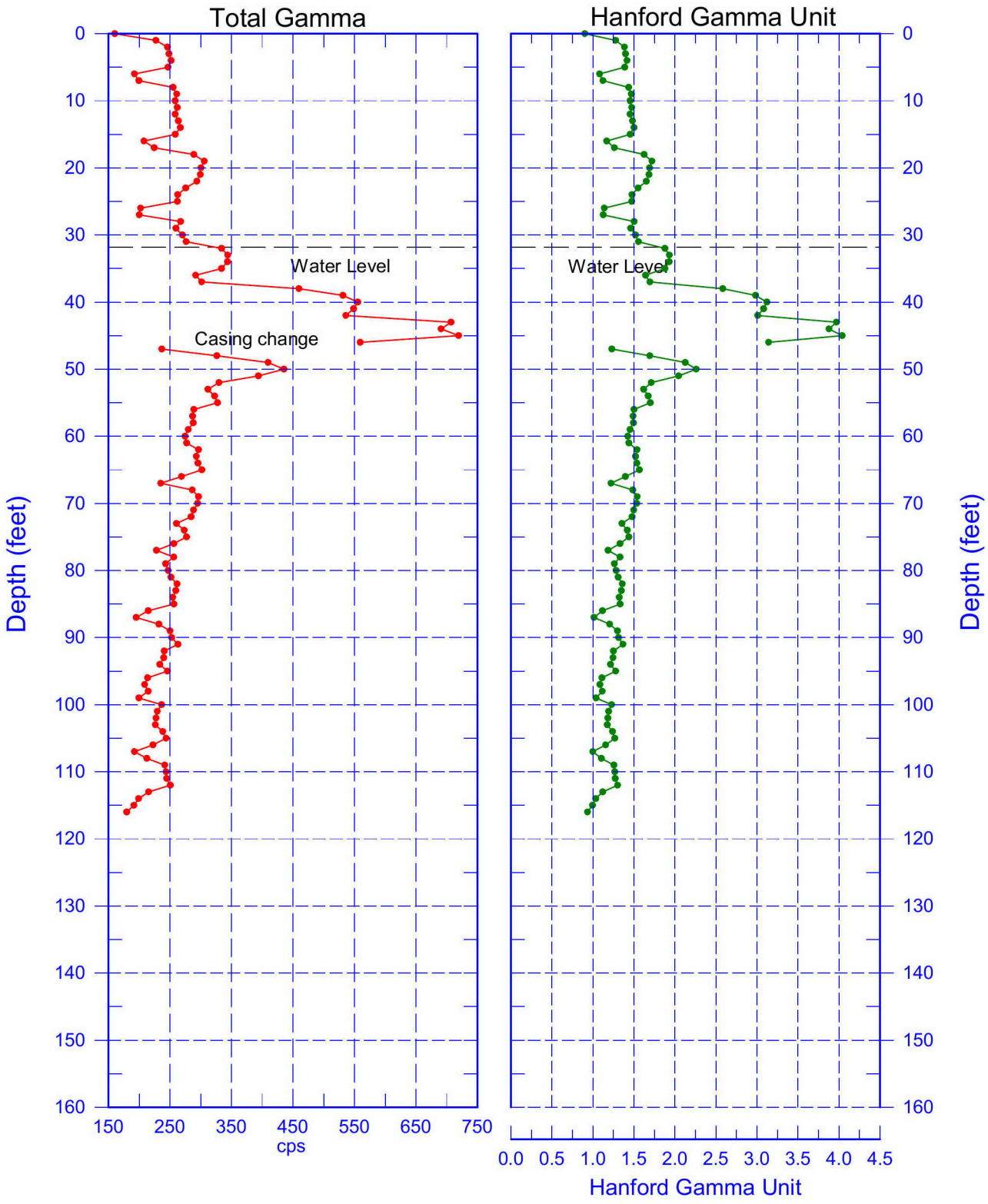


Reference - Ground Surface

Stoller Hanford Office

399-1-56 (C7655)

Total Gamma & Hanford Gamma Unit

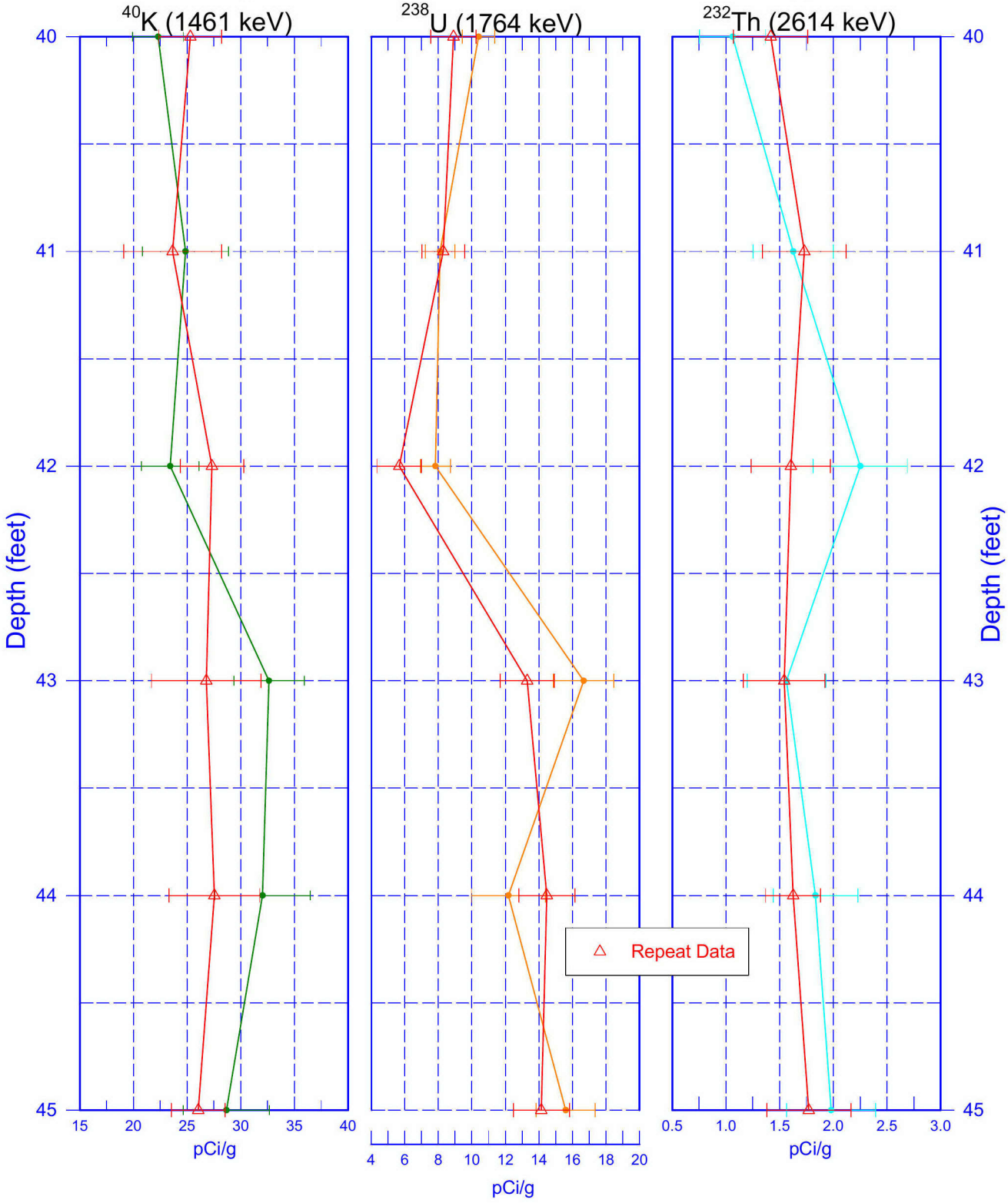


Reference - Ground Surface

Stoller Hanford Office

399-1-56 (C7655)

Repeat Section of Natural Gamma Logs

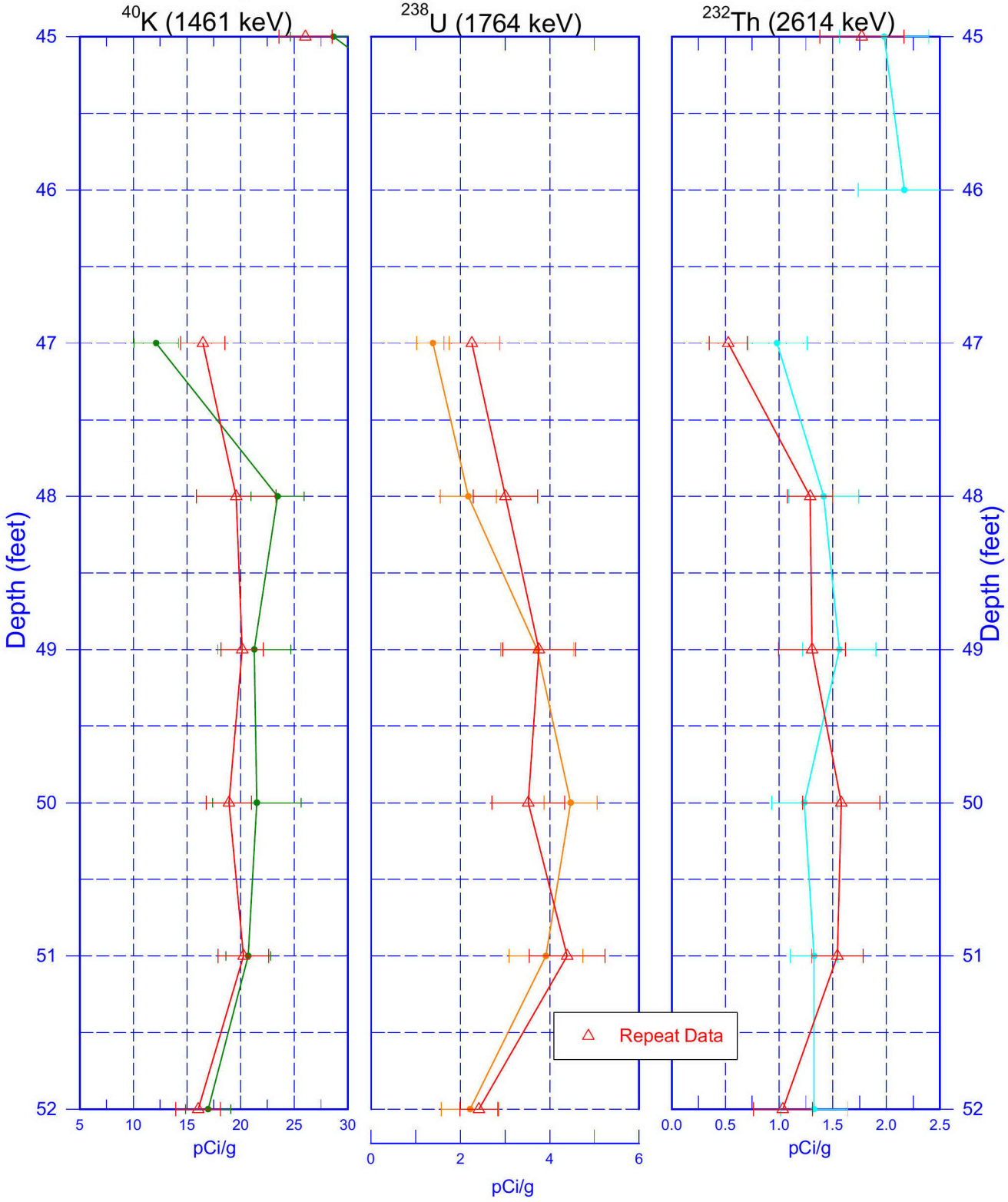


Zero Reference - Ground Surface

Stoller Hanford Office

399-1-56 (C7655)

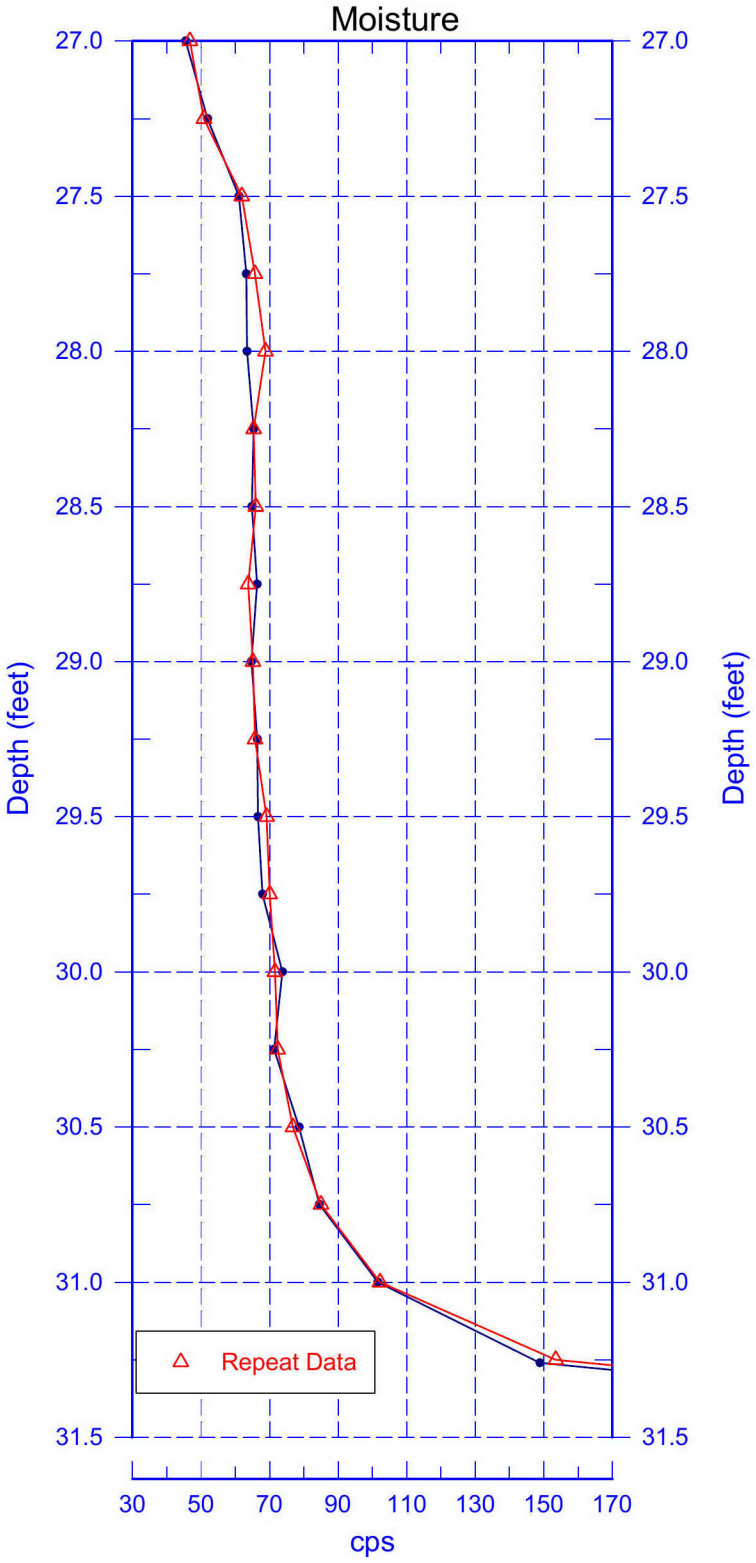
Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Stoller
Hanford Office

399-1-56 (C7655)
Moisture Repeat Section



Reference - Ground Surface

Stoller Hanford Office established 1959

HGLP-LDR-500, Rev. 0

399-1-57 (C7656)
Log Data Report

Borehole Information:

Borehole:	399-1-57 (C7656)		Site:	300-FF-5	
Coordinates (WA St Plane)		GWL[1] (ft) :	33.5	GWL Date:	08/16/10
North (m)	East (m)	Drill Date	TOC[2] Elevation	Total Depth (ft)	Type
Unknown	Unknown	Unknown	Unknown	118	Sonic

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded Steel	4.1	10 1/2	9 3/4	3/8	4.1	106
Threaded Steel	1.2	7	6 ¼	3/8	1.2	118

Borehole Notes:

The buyer's technical representative reported depth to bottom and depth of casing. The logging engineer measured casing diameters (rounded to the nearest 1/16-in) and depth to water.

The zero reference is the ground surface.

Logging Equipment Information:

Logging System:	Gamma 1 N		Type: / Serial No.:	60% HPGe SGLS / 45-TP22010A
Effective Calibration Date:	05/05/2010	Calibration Reference:	HGLP-CC-057, Rev. 0.	
		Logging Procedure:	HGLP-MAN-002, Rev. 0	

Logging System:	Gamma 1 H		Type: / Serial No.:	NMLS / H310700352
Effective Calibration Date:	05/17/2010	Calibration Reference:	HGLP-CC-058, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat	5	6 Repeat	
HEIS Number	1016970	1016971	1016972	1016973	
Date	08/16/10	08/16/10	08/18/10	08/18/10	
Logging Engineer	Pearson	Pearson	McClellan	McClellan	
Start Depth (ft)	0.0	90.0	100.0	108.0	
Finish Depth (ft)	102.0	100.0	117.0	110.0	
Count Time (sec)	100	100	100	100	
Live/Real	R	R	R	R	
Shield (Y/N)	N	N	N	N	
MSA Interval (ft)	1.0	1.0	1.0	1.0	
Log Speed (ft/min)	N/A	N/A	N/A	N/A	
Pre-Verification	AN162CAB	AN162CAB	AN163CAB	AN163CAB	
Start File	AN162000	AN162103	AN163000	AN163018	
Finish File	AN162102	AN162113	AN163017	AN163020	
Post-Verification	AN162CAA	AN162CAA	AN163CAA	AN163CAA	
Depth Return Error (in.)	N/A	0.0	N/A	0.0	

Log Run	1	2 Repeat	5	6 Repeat	
Comments	No fine gain adjustments made.	No fine gain adjustments made.	No fine gain adjustments made.	No fine gain adjustments made.	

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	3	4 Repeat			
HEIS Number	1016974	1016975			
Date	08/16/10	08/16/10			
Logging Engineer	Pearson	Pearson			
Start Depth (ft)	0.0	14.0			
Finish Depth (ft)	33.0	17.0			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
Log Speed (ft/min)	N/A	N/A			
Pre-Verification	AH040CAB	AH040CAB			
Start File	AH040000	AH040133			
Finish File	AH040132	AH040145			
Post-Verification	AH040CAA	AH040CAA			
Depth Return Error (in.)	N/A	0.0			
Comments	None	None			

Logging Operation Notes:

SGLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the KUTh-118 field verifier. A centralizer was installed on the sonde.

NMLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the standard field verifier. A centralizer was installed on the sonde.

Analysis Notes:

Analyst:	LEGLER	Date:	08/24/2010	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre- and post survey verification measurements met the acceptance criteria for the established systems.

A casing correction for 3/8-in. thick casing was applied during analysis.

A water correction was applied from 33.5 feet to the total logged depth of the borehole.

SGLS spectra were processed in batch mode in APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated an EXCEL templates identified as AN20100505, using an efficiency function, corrections for casing and dead time as determined by annual calibrations.

During routine processing of gamma spectra, regions of interest are forced at specific energy levels associated with natural and manmade radionuclides that can be anticipated to be present. This processing approach sometimes results in an isolated “detection” near the Minimum Detection Level (MDL) resulting in a false positive. Where these detections occur, the individual spectrum is scrutinized and a determination is made regarding the validity of the detection. If the detection is deemed not representative of a full energy peak, or if confirming peaks are not detected, it is removed from the data set. The integrity of the raw data files and the processed files are maintained should questions arise in the future regarding these determinations.

The neutron moisture log data presented in counts per second (cps) as there is no calibration available for a 9-in. borehole.

The Hanford Gamma Unit (HGU) is an empirical unit of gamma activity proposed as a means to standardize gamma log response across multiple logging systems with different response characteristics. The HGU is defined in terms of measurements in the Hanford Borehole Calibration Facility, and the magnitude is selected such that 1 HGU is approximately equivalent to typical Hanford background activity, based on data from background samples as reported in *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12).

Results and Interpretations:

No man-made radionuclides were detected in this borehole, although MDLs for Cs-137, U-235, and U-238 (Pa-234m) are plotted.

The naturally occurring U-238 plots may indicate the presence of radon at depths below 60 ft.

The neutron moisture log primarily responds to moisture present in the surrounding formation. In general, an increase in count rate reflects an increase in moisture content. Moisture content may increase in sediments of relatively high silt or clay content. A general increase is observed from 4 to 15 ft.

The repeat plots indicate that the respective systems were working properly.

List of Log Plots:

Depth Reference is ground surface

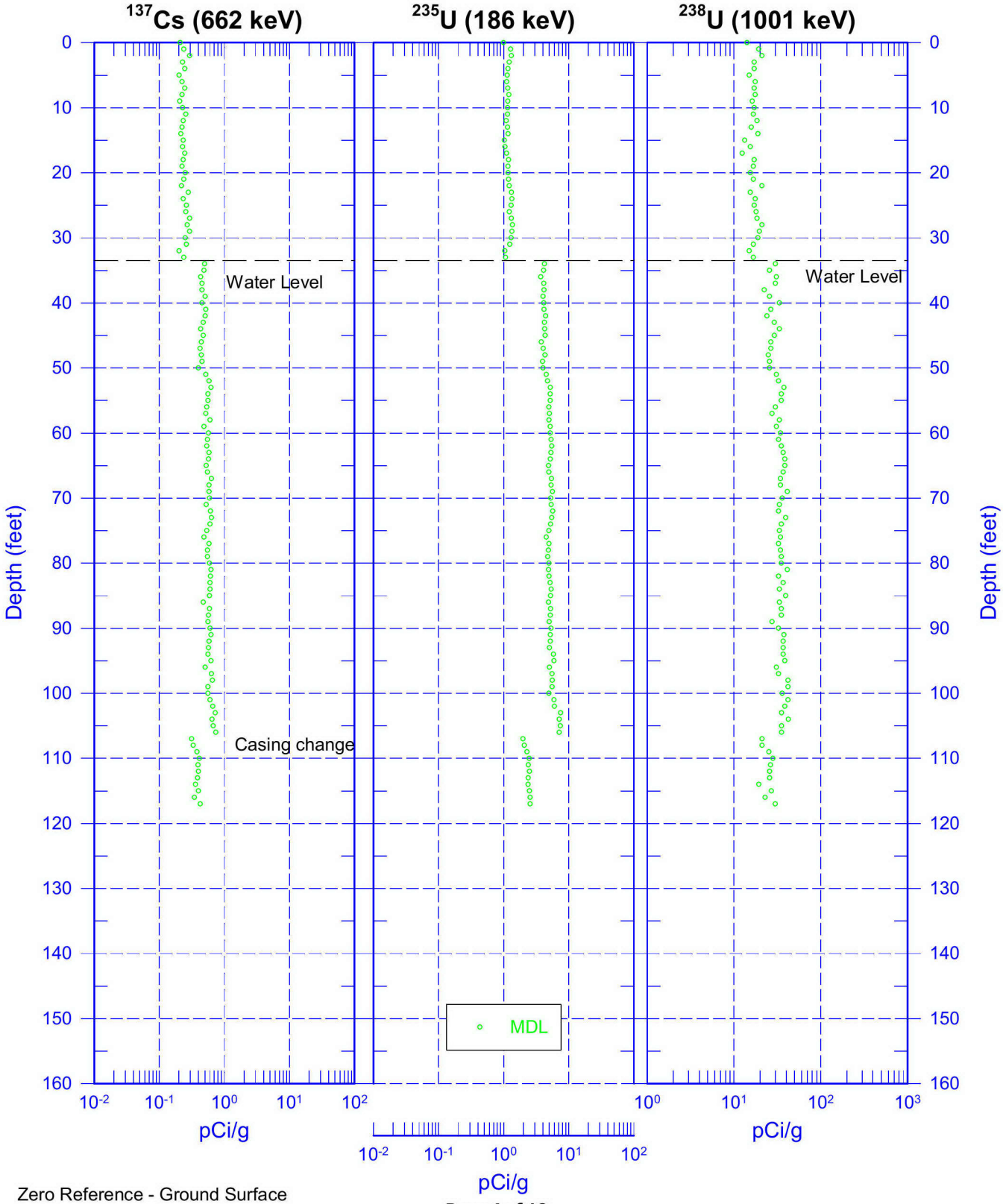
Manmade Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma & Dead Time
Total Gamma & Moisture
Total Gamma & Hanford Gamma Unit
Repeat Section of Natural Gamma Logs (90-100 ft)
Repeat Section of Natural Gamma Logs (108-110 ft)
Moisture Repeat Section

[1] GWL – groundwater level
[2] TOC – top of casing

HGLP-LDR-500, Rev. 0

Stoller Hanford Office

399-1-57 (C7656)
Manmade Radionuclides

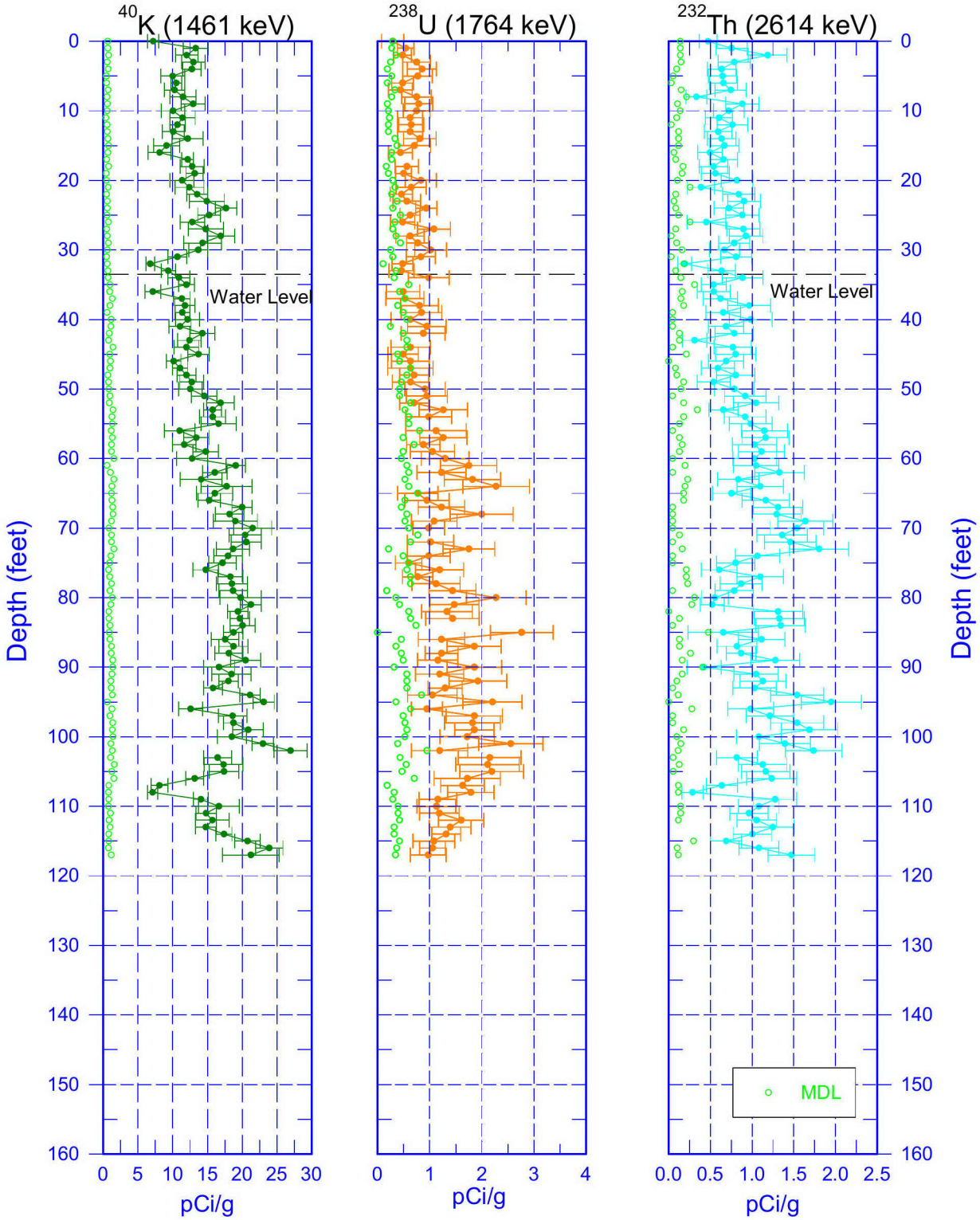


Zero Reference - Ground Surface

Stoller Hanford Office

HGLP-LDR-500, Rev. 0

399-1-57 (C7656)
Natural Gamma Logs

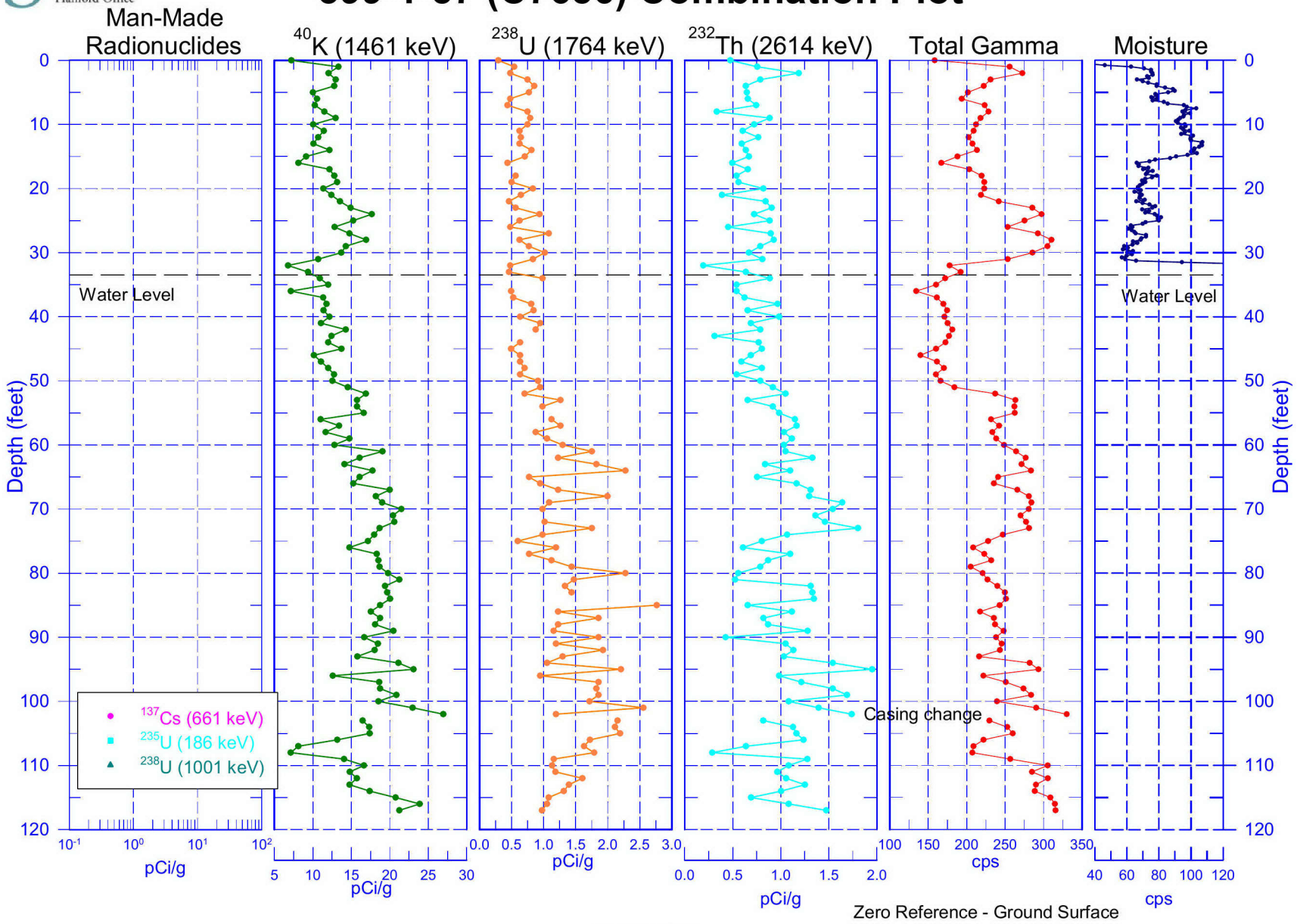


Zero Reference - Ground Surface

Stoller
Hanford Office

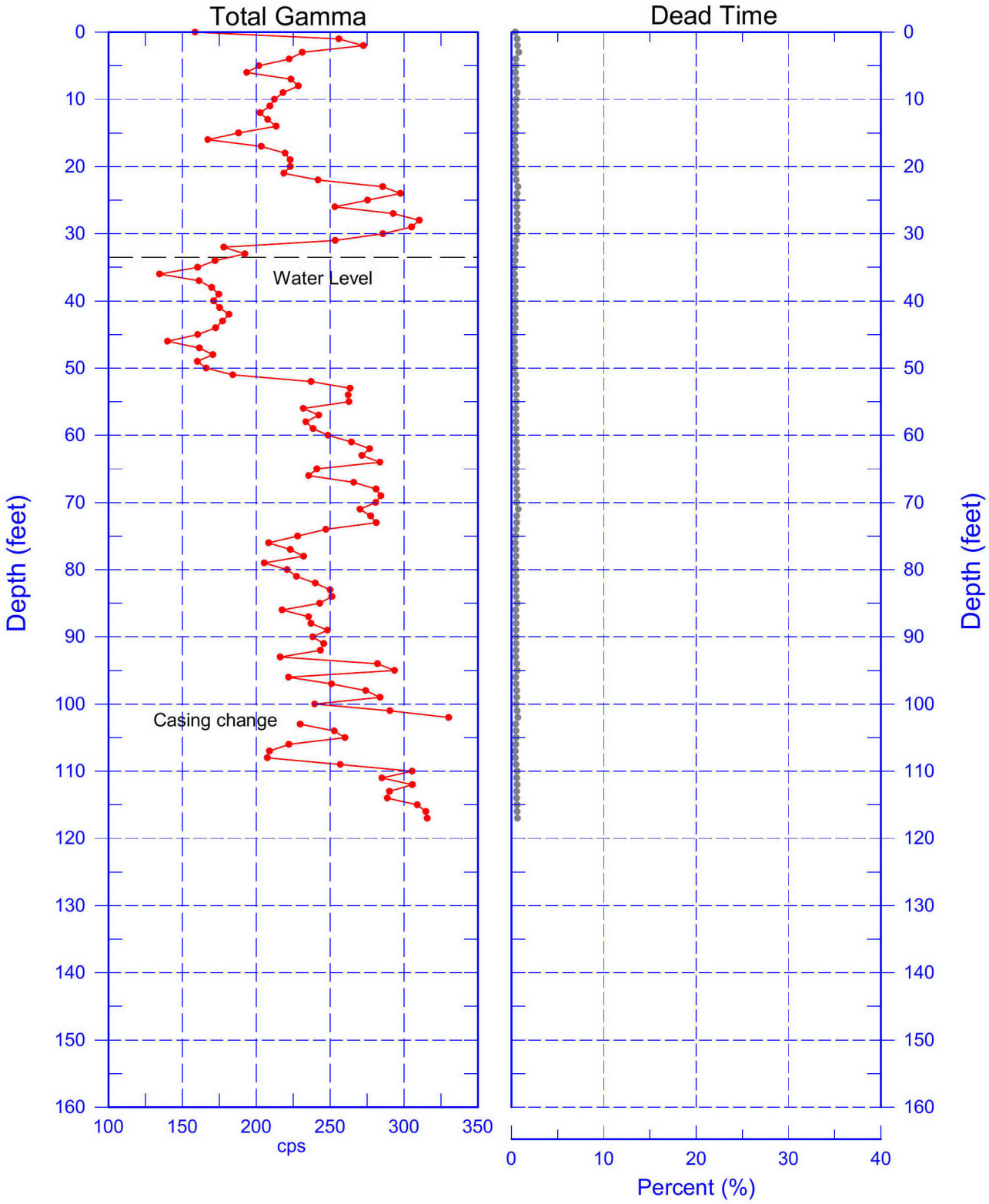
HGLP-LDR-500, Rev. 0

399-1-57 (C7656) Combination Plot



Stoller
Hanford Office

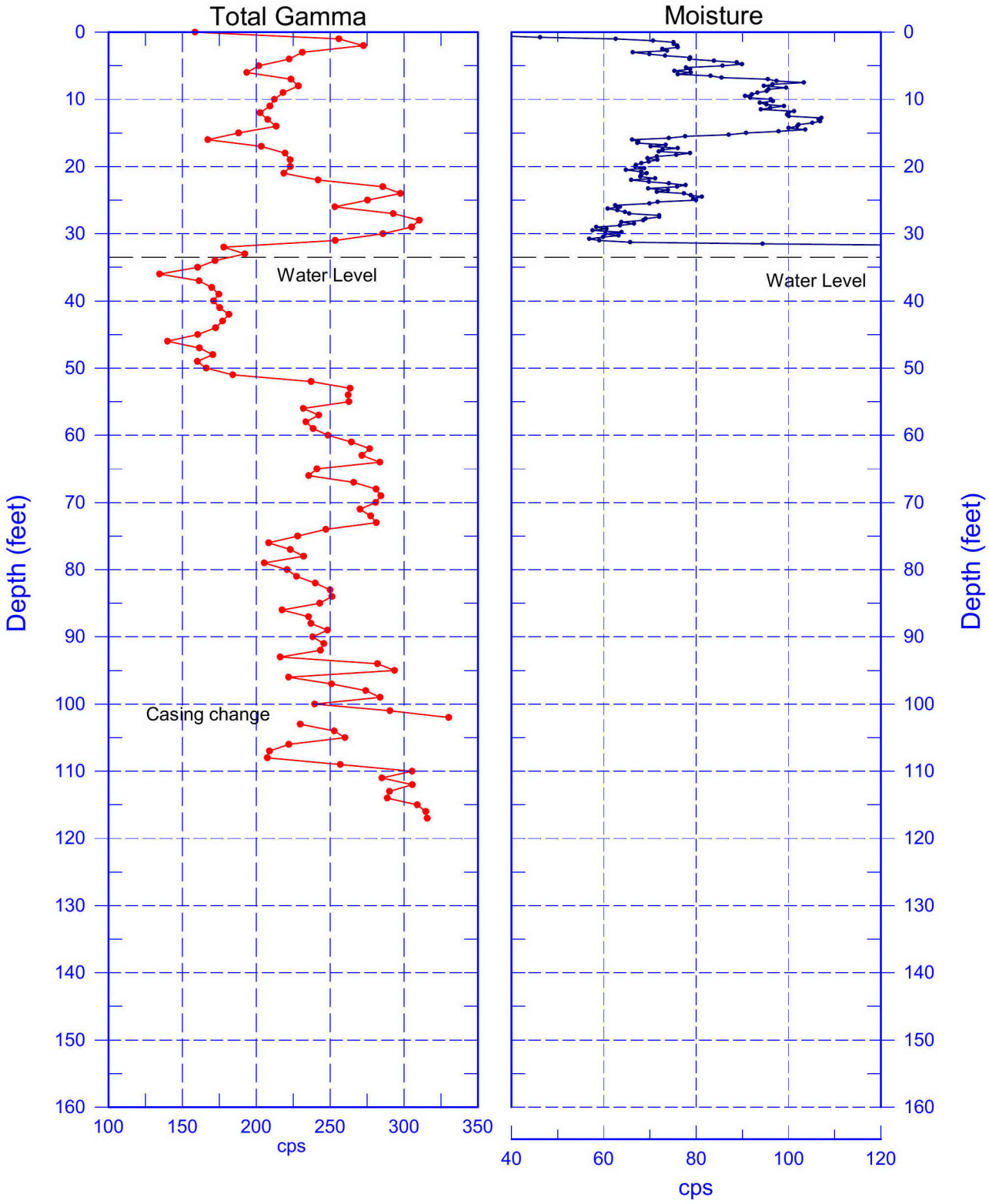
399-1-57 (C7656)
Total Gamma & Dead Time



Reference - Ground Surface

Stoller
Hanford Office

399-1-57 (C7656)
Total Gamma & Moisture

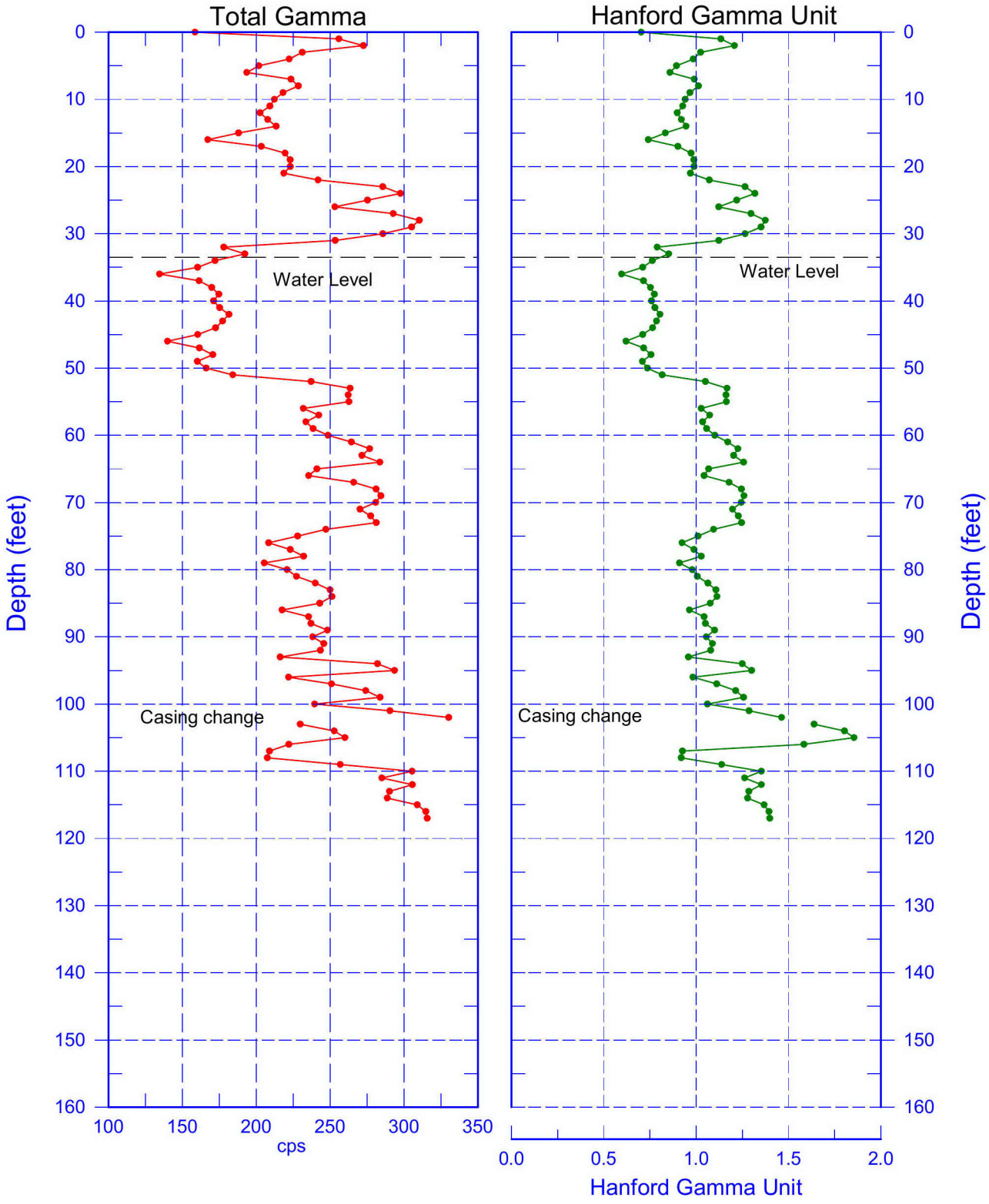


Reference - Ground Surface

Stoller Hanford Office

399-1-57 (C7656)

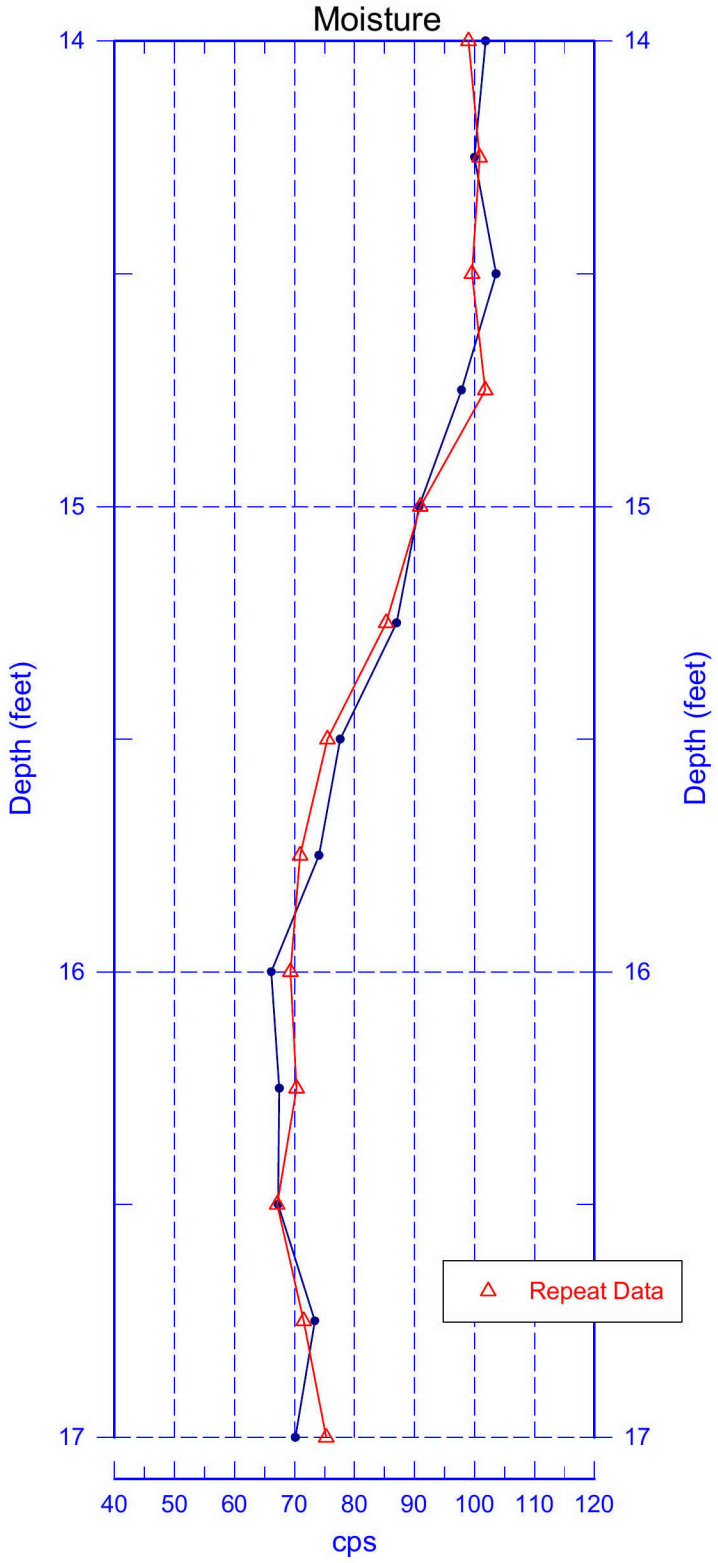
Total Gamma & Hanford Gamma Unit



Reference - Ground Surface

Stoller
Hanford Office

399-1-57 (C7656)
Moisture Repeat Section



Reference - Ground Surface

Stoller Hanford Office established 1959

HGLP-LDR-514, Rev. 0

399-1-58 (C7657)
Log Data Report

Borehole Information:

Borehole:	399-1-58 (C7657)		Site:	300-FF-5	
Coordinates (WA St Plane)		GWL[1] (ft) :	48.9	GWL Date:	09/07/10
North (m)	East (m)	Drill Date	TOC[2] Elevation	Total Depth (ft)	Type
Unknown	Unknown	09/02/10	Unknown	126.0	Sonic

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded Steel	4.0	12	10 7/8	9/16	4.0	46.0
Threaded Steel	2.7	10 1/2	9 3/4	5/8	2.7	106

Borehole Notes:

The Buyer's Technical Representative (BTR) reported depth of casing and total depth of borehole. The logging engineer measured depth to water and casing diameters (rounded to the nearest 1/16-in.) and stick up.

This borehole was logged on two (2) separate days, where each day represents logging in a single casing.

The zero reference is the ground surface.

Logging Equipment Information:

Logging System:	Gamma 1 N		Type: Serial No.:	60% HPGe SGLS 45-TP22010A
Effective Calibration Date:	05/05/10	Calibration Reference:	HGLP-CC-057, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Logging System:	Gamma 1 H		Type: Serial No.:	NMLS H310700352
Effective Calibration Date:	05/17/10	Calibration Reference:	HGLP-CC-058, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat	5	6 Repeat	
HEIS Number	1016994	1016995	1016996	1016997	
Date	08/30/10	08/30/10	09/07/10	09/07/10	
Logging Engineer	Pearson	Pearson	McClellan	McClellan	
Start Depth (ft)	44.0	5.0	43.0	102.0	
Finish Depth (ft)	0.0	0.0	109.0	109.0	
Count Time (sec)	100	100	100	100	
Live/Real	R	R	R	R	
Shield (Y/N)	N	N	N	N	
MSA Interval (ft)	1.0	1.0	1.0	1.0	
Log Speed (ft/min)	N/A	N/A	N/A	N/A	
Pre-Verification	AN165CAB	AN165CAB	AN167CAB	AN167CAB	
Start File	AN166000	AN166045	AN167000	AN167067	
Finish File	AN166044	AN166050	AN167066	AN167074	

Log Run	1	2 Repeat	5	6 Repeat	
Post-Verification	AN166CAA	AN166CAA	AN167CAA	AN167CAA	
Depth Return Error (in.)	1/2 High	1/2 High	N/A	0.0	
Comments	No fine gain adjustments made.	No fine gain adjustments made.	No fine gain adjustments made.	No fine gain adjustments made.	

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	3	4 Repeat	7		
HEIS Number	1016998	1016999	1016970		
Date	08/30/10	08/30/10	09/07/10		
Logging Engineer	Pearson	Pearson	McClellan		
Start Depth (ft)	0.0	39.0	43.00		
Finish Depth (ft)	44.0	44.0	48.75		
Count Time (sec)	15	15	15		
Live/Real	R	R	R		
Shield (Y/N)	N	N	N		
MSA Interval (ft)	0.25	0.25	0.25		
Log Speed (ft/min)	N/A	N/A	N/A		
Pre-Verification	AH042CAB	AH042CAB	AH043CAB		
Start File	AH042000	AH042177	AH043000		
Finish File	AH042176	AH042197	AH043023		
Post-Verification	AH042CAA	AH042CAA	AH043CAA		
Depth Return Error (in.)	N/A	1/2 High	0.0		
Comments	None.	None.	None.		

Logging Operation Notes:

SGLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the KUTh-118 field verifier. A centralizer was installed on the sonde.

NMLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the standard field verifier. A centralizer was installed on the sonde.

Analysis Notes:

Analyst:	LEGLER	Date:	09/22/10	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre- and post survey verification measurements met the acceptance criteria for the established systems.

A casing correction for 9/16-in. thick casing was applied from ground surface to 44 ft, a combined casing correction of 1.19-in. (12-in. and 10-in. respectively) from 44 to 45 ft, and a casing correction for a 5/8-in. thick casing was applied from 45 to 106 ft during analysis.

A water correction was applied from 48.9 ft to the total logged depth of the borehole.

SGLS spectra were processed in batch mode in APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated in EXCEL templates identified as AN20100505, using an efficiency function, corrections for casing and dead time as determined by annual calibrations.

During routine processing of gamma spectra, regions of interest are forced at specific energy levels associated with natural and manmade radionuclides that can be anticipated to be present. This processing approach sometimes results in an isolated “detection” near the Minimum Detection Level (MDL) resulting in a false positive. Where these detections occur, the individual spectrum is scrutinized and a determination is made regarding the validity of the detection. If the detection is deemed not representative of a full energy peak, or if confirming peaks are not

detected, it is removed from the data set. The integrity of the raw data files and the processed files are maintained should questions arise in the future regarding these determinations.

The neutron moisture log data are presented in counts per second (cps) as there are no calibrations available for 12-in. and 10-in. boreholes.

The Hanford Gamma Unit (HGU) is an empirical unit of gamma activity proposed as a means to standardize gamma log response across multiple logging systems with different response characteristics. The HGU is defined in terms of measurements in the Hanford Borehole Calibration Facility, and the magnitude is selected such that 1 HGU is approximately equivalent to typical Hanford background activity, based on data from background samples as reported in *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12).

Results and Interpretations:

No manmade radionuclides were detected in this borehole, although MDLs for Cs-137, U-235 and U-238 (Pa-234m) are plotted.

The neutron moisture log primarily responds to moisture present in the surrounding formation. In general, an increase in count rate reflects an increase in moisture content. Moisture content may increase in sediments of relatively high silt or clay content.

The repeat plots indicate that the respective systems were working properly.

List of Log Plots:

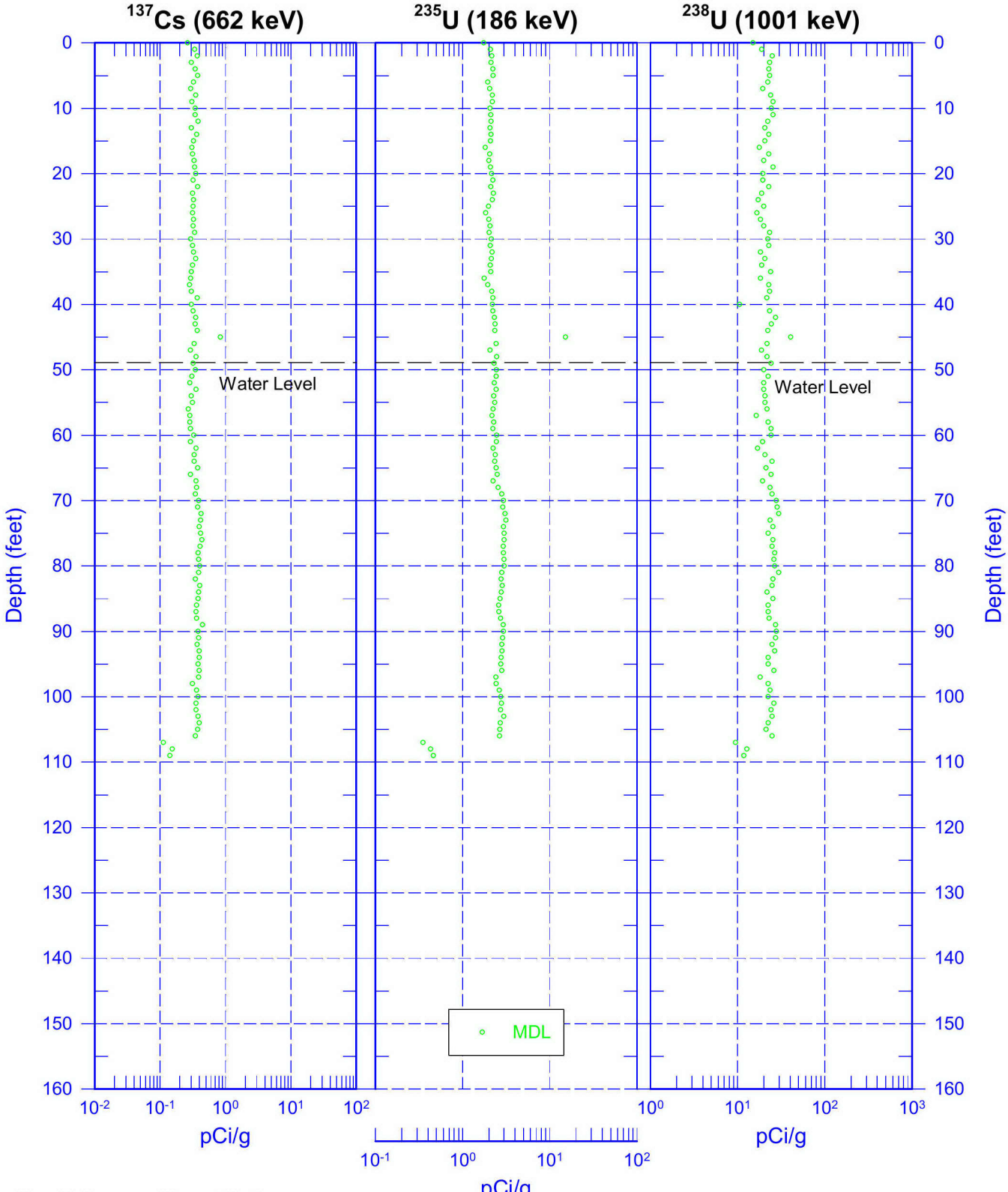
Depth Reference is ground surface

Manmade Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma & Dead Time
Total Gamma & Moisture
Total Gamma & Hanford Gamma Unit
Repeat Section of Natural Gamma Logs (2 pages)
Moisture Repeat Section

[1] GWL – groundwater level
[2] TOC – top of casing

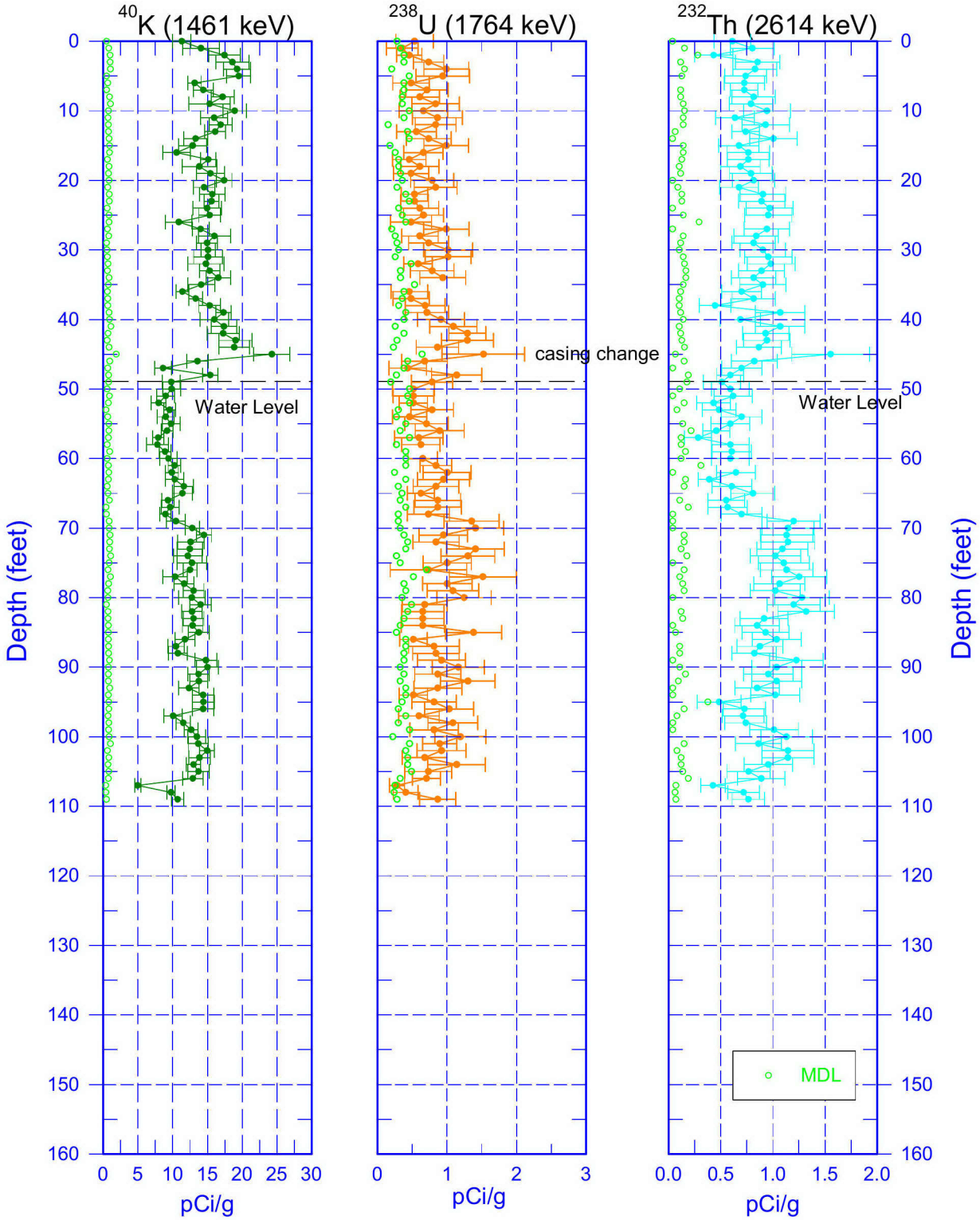
Stoller Hanford Office

399-1-58 (C7657)
Manmade Radionuclides



Stoller Hanford Office

399-1-58 (C7657)
Natural Gamma Logs

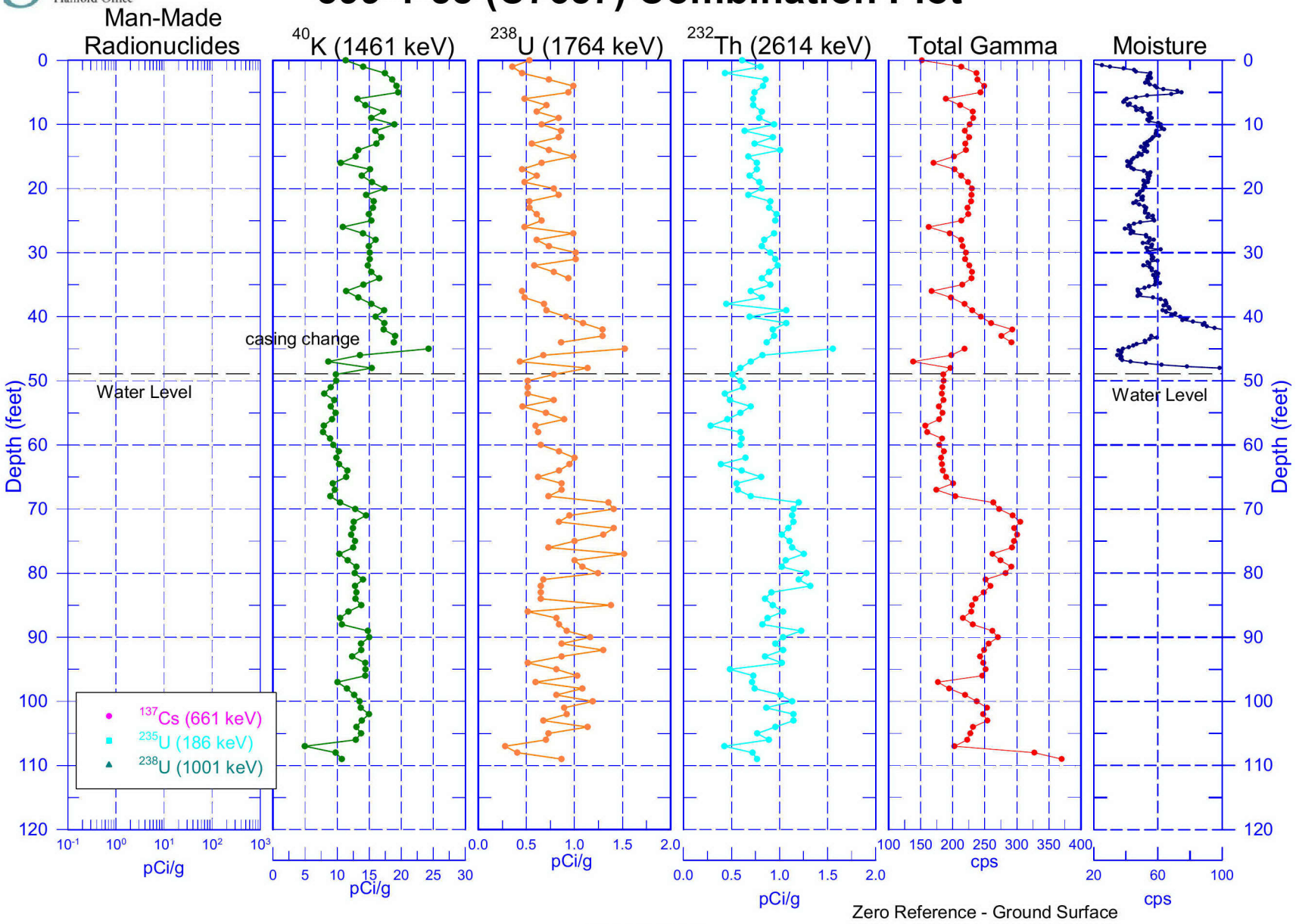


Zero Reference - Ground Surface

Stoller
Hanford Office

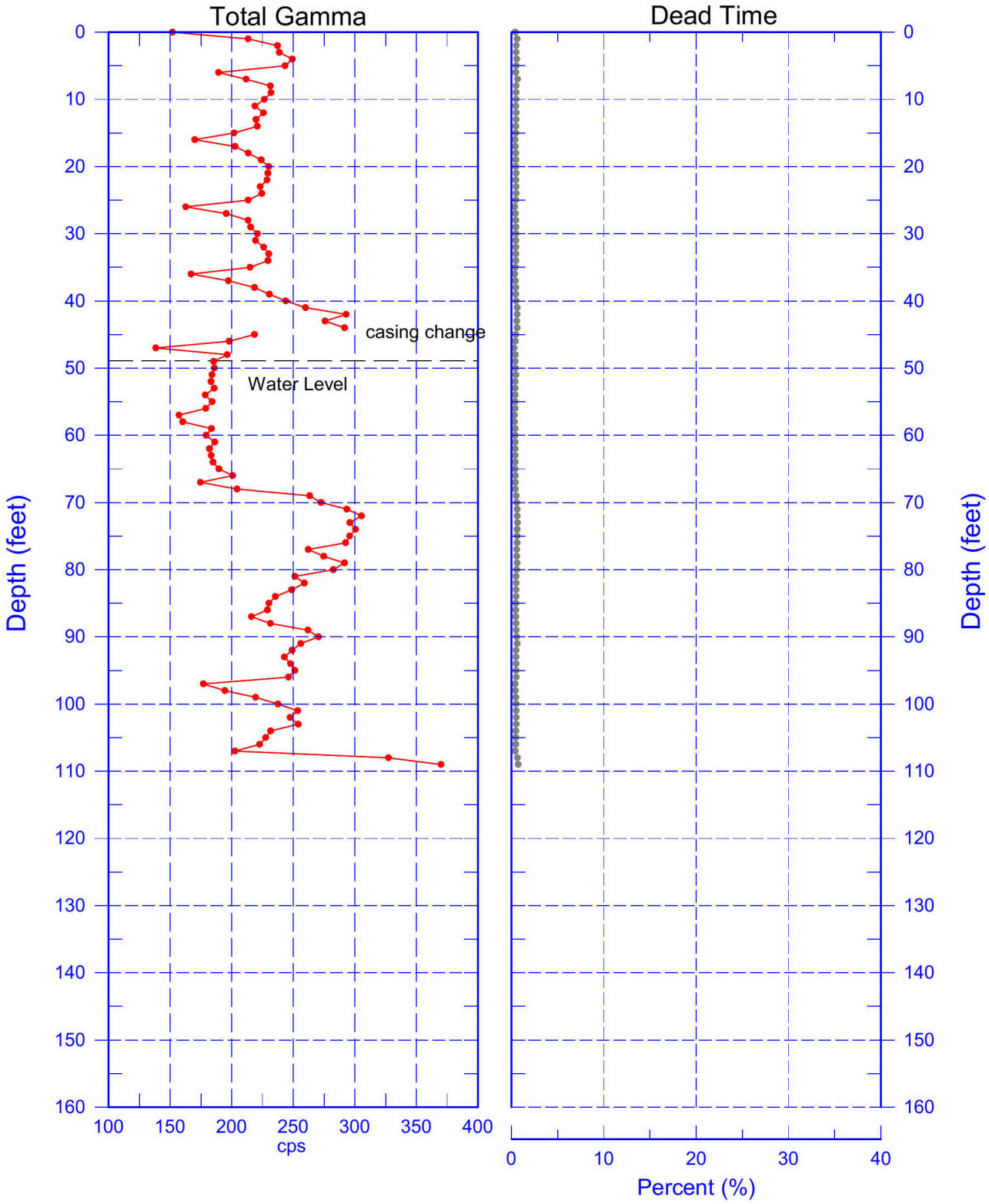
HGLP-LDR-514, Rev. 0

399-1-58 (C7657) Combination Plot



Stoller Hanford Office

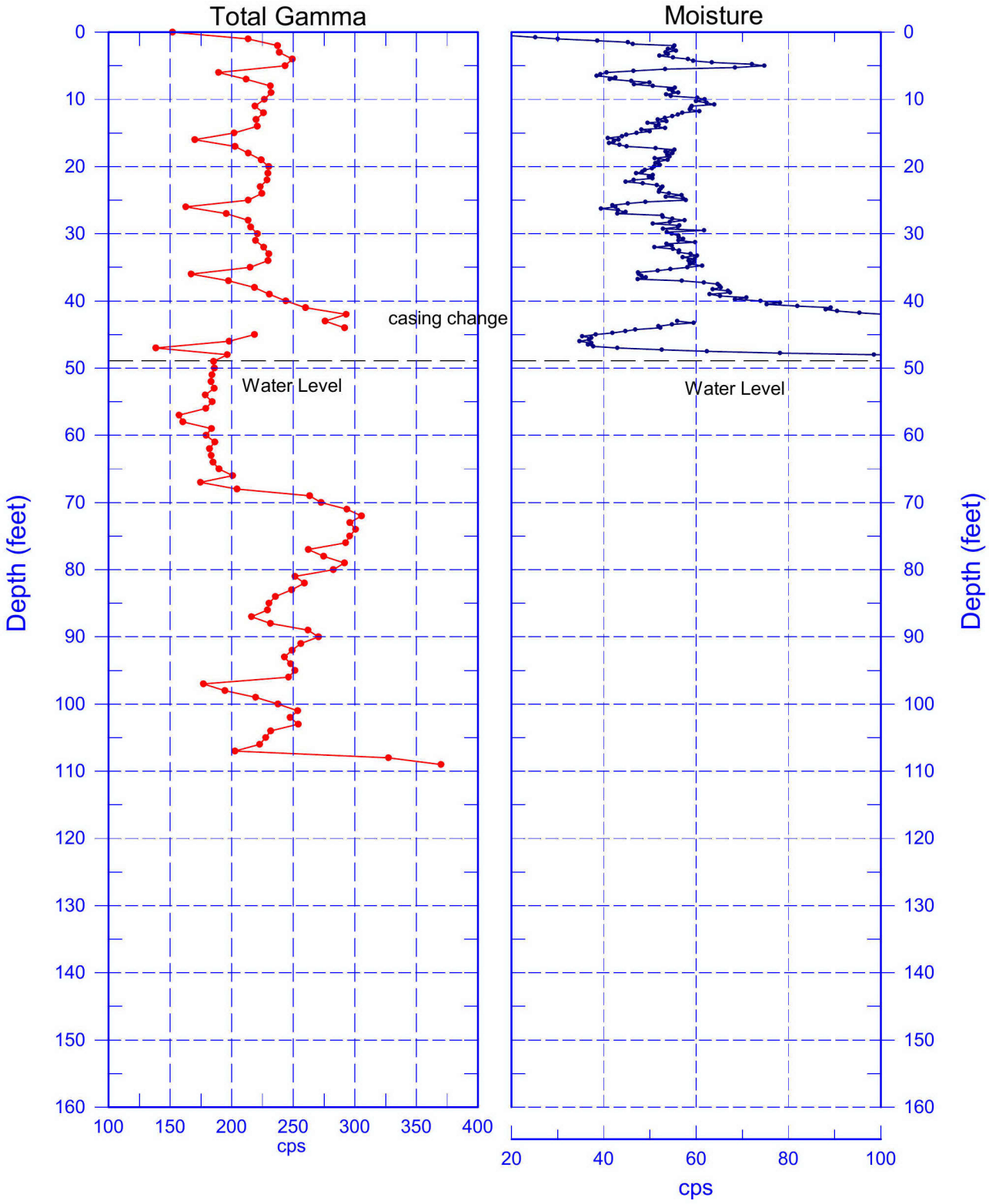
399-1-58 (C7657)
Total Gamma & Dead Time



Reference - Ground Surface

Stoller
Hanford Office

399-1-58 (C7657)
Total Gamma & Moisture

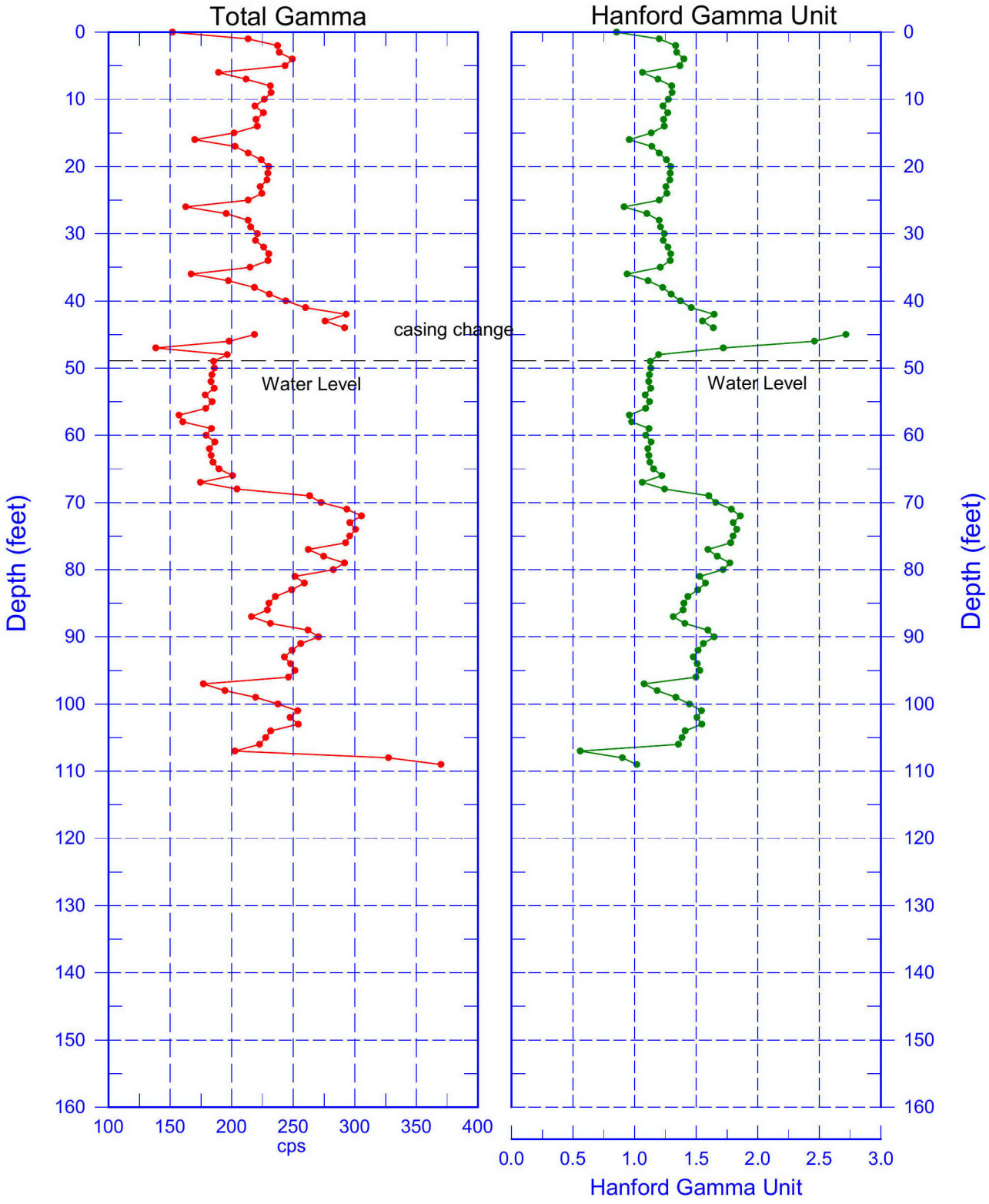


Reference - Ground Surface

Stoller Hanford Office

399-1-58 (C7657)

Total Gamma & Hanford Gamma Unit

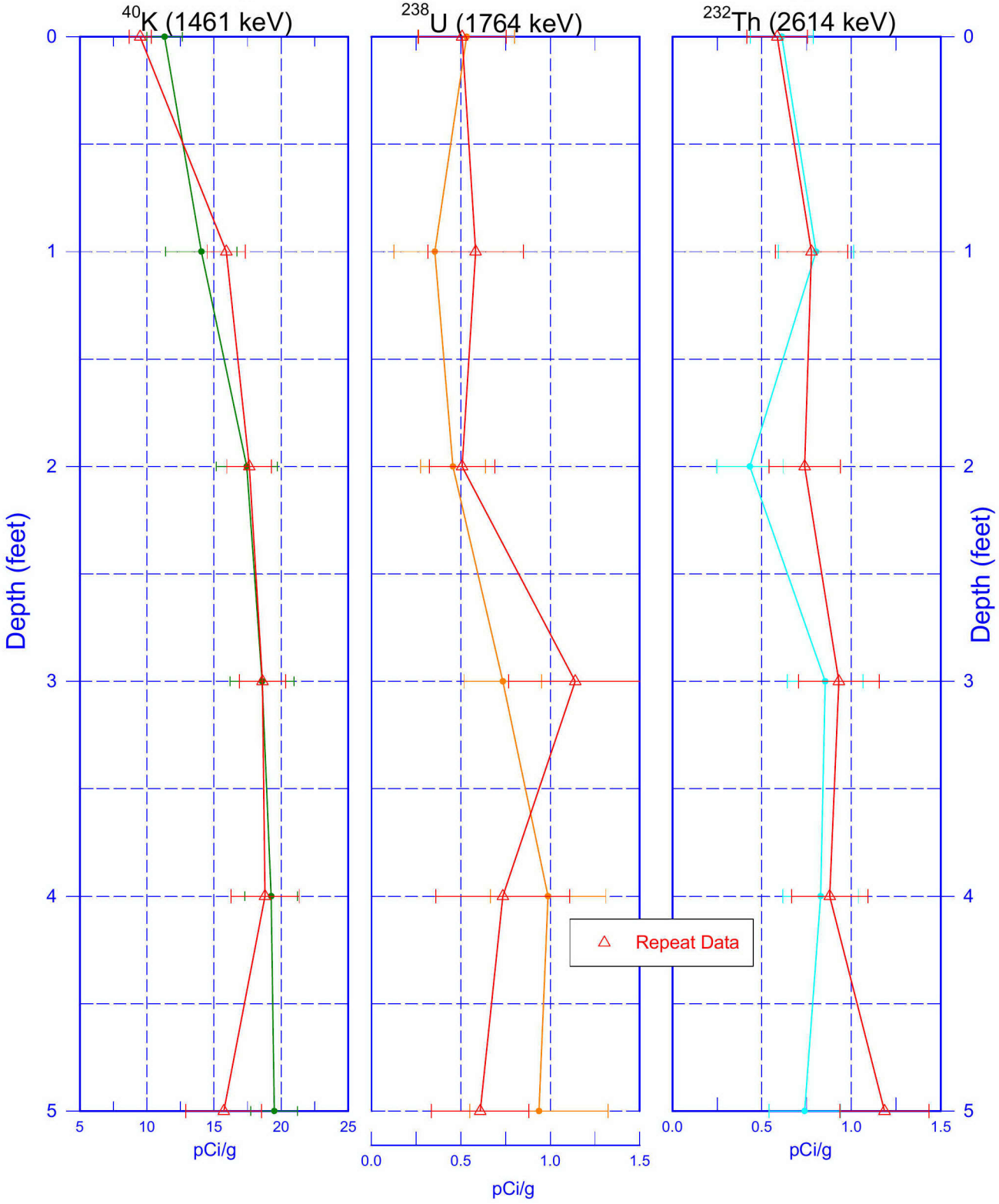


Reference - Ground Surface

Stoller Hanford Office

399-1-58 (C7657)

Repeat Section of Natural Gamma Logs

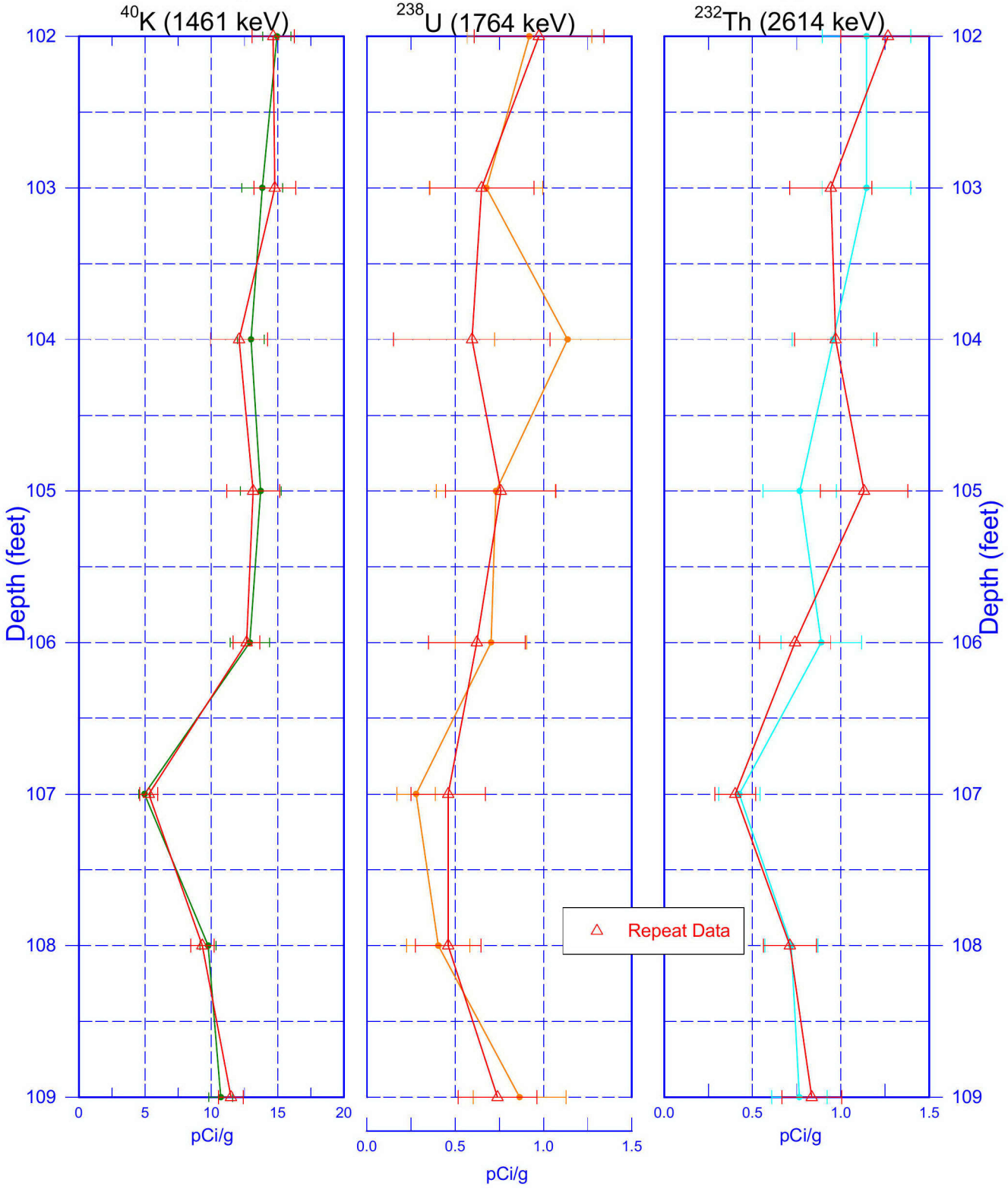


Zero Reference - Ground Surface

Stoller Hanford Office

399-1-58 (C7657)

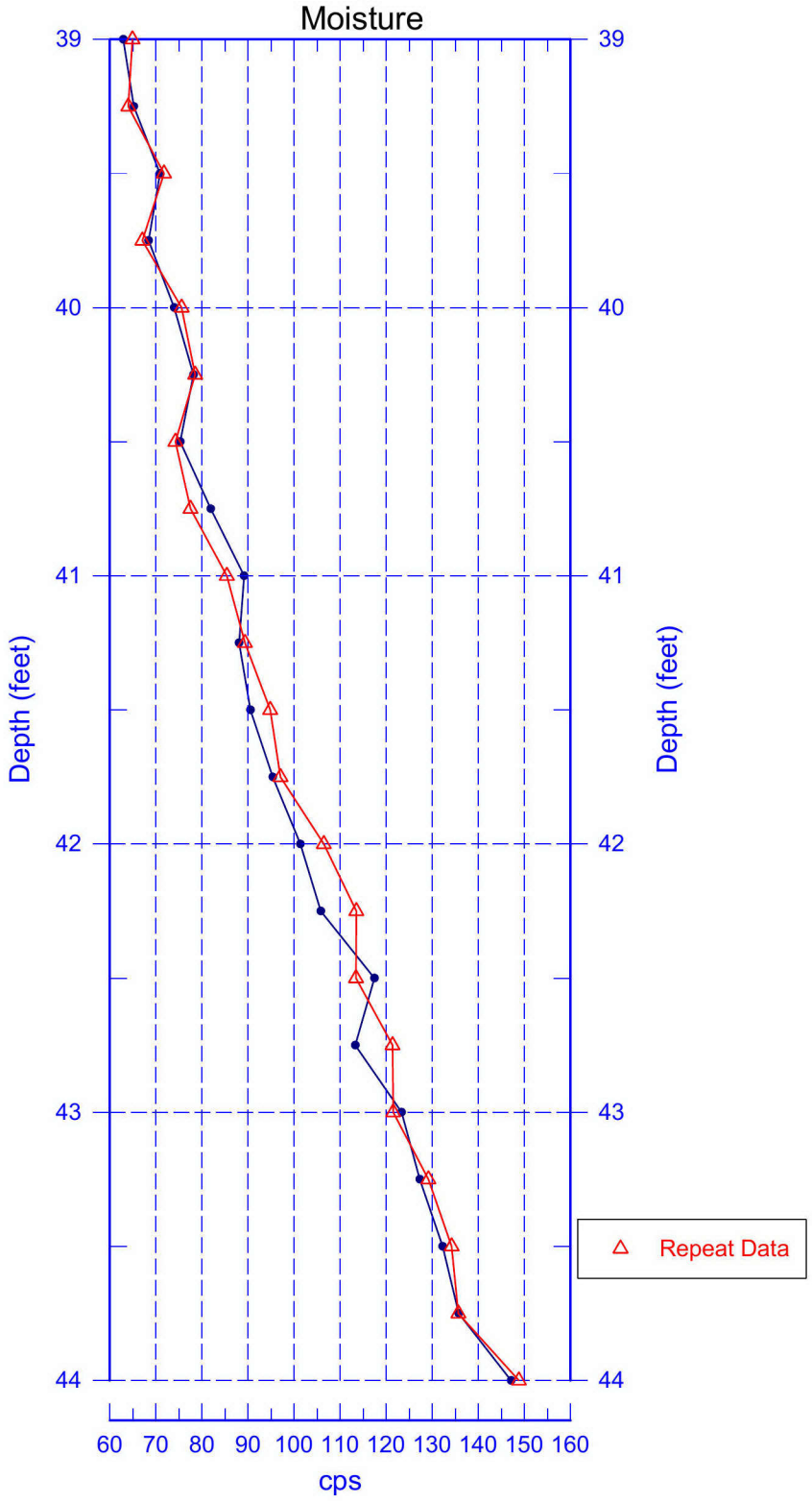
Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Stoller
Hanford Office

399-1-58 (C7657)
Moisture Repeat Section



Reference - Ground Surface

Stoller Hanford Office established 1959

HGLP-LDR-551, Rev. 0

399-6-3 (C7658)
Log Data Report

Borehole Information:

Borehole:	399-6-3 (C7658)		**Site:**	300-FF-5	
Coordinates (WA St Plane)		**GWL[1] (ft):**	45.2	**GWL Date:**	12/21/10
North (m)	**East (m)**	**Drill Date**	**TOC Elevation**	**Total Depth (ft)**	**Type**
Unknown	Unknown	12/29/10	Unknown	128.4	Cable/Sonic

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded steel	2.9	12	10 7/8	9/16	2.9	47.1
Threaded steel	3.4	10 1/2	9 5/8	7/16	3.4	126.0

Borehole Notes:

The total depth and casing depths were reported by the Buyer's Technical Representative. The logging engineer measured casing diameter employing a steel tape and rounding to the nearest 1/16-in.

The borehole was drilled on 12/21/10 to 48 ft using the cable tool and drilled deeper to 128 ft with the sonic on 12/29/10.

Zero reference is ground surface.

Spectral Gamma Logging System (SGLS) Equipment Information:

Logging System:	Gamma 4L		**Type:**	(60%) HPGe SGLS SN: 47TP32211A
Effective Calibration Date:	1/20/10	**Calibration Reference:**	HGLP-CC-054	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Neutron Moisture Logging System (NMLS) Equipment Information:

Logging System:	Gamma 4M		**Type:**	NMLS SN: H340207279
Effective Calibration Date:	1/18/10	**Calibration Reference:**	HGLP-CC-052	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	3	4 Repeat	5	6 Repeat	
HEIS number	1017350	1017351	1017352	1017353	
Date	12/21/10	12/21/10	12/30/10	12/30/10	
Logging Engineer	Pearson	Pearson	Spatz	Spatz	
Start Depth (ft)	47.0	5.0	46.0	70.0	
Finish Depth (ft)	0.0	0.0	127.0	79.0	
Count Time (sec)	100	100	100	100	
Live/Real	R	R	R	R	
Shield (Y/N)	N	N	N	N	
MSA Interval (ft)	1.0	1.0	1.0	1.0	
Log Speed (ft/min)	N/A	N/A	N/A	N/A	
Pre-Verification	DLI81CAB	DLI81CAB	DLI91CAB	DLI91CAB	
Start File	DLI81000	DLI81048	DLI91000	DLI91082	
Finish File	DLI81047	DLI81053	DLI91081	DLI91091	
Post-Verification	DLI81CAA	DLI81CAA	DLI91CAA	DLI91CAA	
Depth Return Error (in.)	1/4 high	1/4 high	N/A	0	

Stoller Hanford Office established 1959

HGLP-LDR-551, Rev. 0

Log Run	3	4 Repeat	5	6 Repeat	
Comments	No fine-gain adjustment made	No fine-gain adjustment made	No fine-gain adjustment made	No fine-gain adjustment made	

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	1	2 Repeat			
HEIS number	1017566	1017567			
Date	12/21/10	12/21/10			
Logging Engineer	Pearson	Pearson			
Start Depth (ft)	0.0	0.0			
Finish Depth (ft)	45.25	5.0			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
Log Speed ft/min	N/A	N/A			
Pre-Verification	DMT92CAB	DMT92CAB			
Start File	DMT92000	DMT92182			
Finish File	DMT92181	DMT92202			
Post-Verification	DMT92CAA	DMT92CAA			
Depth Return Error (in.)	N/A	0			
Comments	None	None			

Logging Operation Notes:

SGLS data were collected using Gamma 4 HO 68B-3573. Pre- and post-survey verification measurements were acquired in the Amersham KUTh-115 field verifier. A centralizer was installed on the sonde.

NMLS data were collected using Gamma 4 HO 68B-3573. Pre- and post-survey verification measurements were acquired in the AmBe standard field verifier. A centralizer was installed on the sonde.

Analysis Notes:

Analyst:	C. Nelson	**Date:**	2/14/11	**Reference:**	HGLP-MAN-003, Rev. 0

The pre- and post-survey verification measurements met the acceptance criteria for the established systems.

Casing corrections for 9/16-in. casing from ground surface to 47 ft, and 7/16-in. casing from 48-126 ft, was applied during analysis, with the bottom one foot uncorrected.

A water correction was applied from 46 ft to the total logged depth of the borehole.

SGLS spectra were processed in batch mode in APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated in EXCEL template identified as DL20100120, using efficiency functions and corrections for casing and dead time as determined by the systems' annual calibration.

During routine processing of gamma spectra, regions of interest are forced at specific energy levels associated with natural and manmade radionuclides that are anticipated to be present. This processing approach sometimes results in an isolated "detection" near the Minimum Detection Level (MDL) resulting in a false positive. Where these detections occur, the individual spectrum is scrutinized and a determination is made regarding the validity of the detection. If the detection is deemed not representative of a full energy peak, or if confirming peaks are not detected, it is removed from the data set. The integrity of the raw data files and the processed files are maintained should questions arise in the future regarding these determinations.

NMLS data are represented in counts per second (cps) because no calibration data exists for a 12-in. diameter borehole.

Stoller Hanford Office established 1959

HGLP-LDR-551, Rev. 0

The Hanford Gamma Unit (HGU) is an empirical unit of gamma activity proposed as a means to standardize gamma log response across multiple logging systems with different response characteristics. The HGU is defined in terms of measurements in the Hanford Borehole Calibration Facility, and the magnitude is selected such that 1 HGU is approximately equivalent to typical Hanford background activity, based on data from background samples as reported in *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12).

Results and Interpretations:

No manmade radionuclides were detected in this borehole. The MDL's for Cs-137, U-235, and U-238 are plotted on the Manmade Radionuclide plot.

The neutron moisture log primarily responds to moisture present in the surrounding formation. In general, an increase in count rate reflects an increase in moisture content. Moisture content may increase in sediments of relatively high silt or clay content. Casing joints may be attenuating gammas and neutrons from the detector at approximately 10-ft intervals.

The KUT and moisture repeat plots indicate that the respective systems were working properly.

List of Plots:

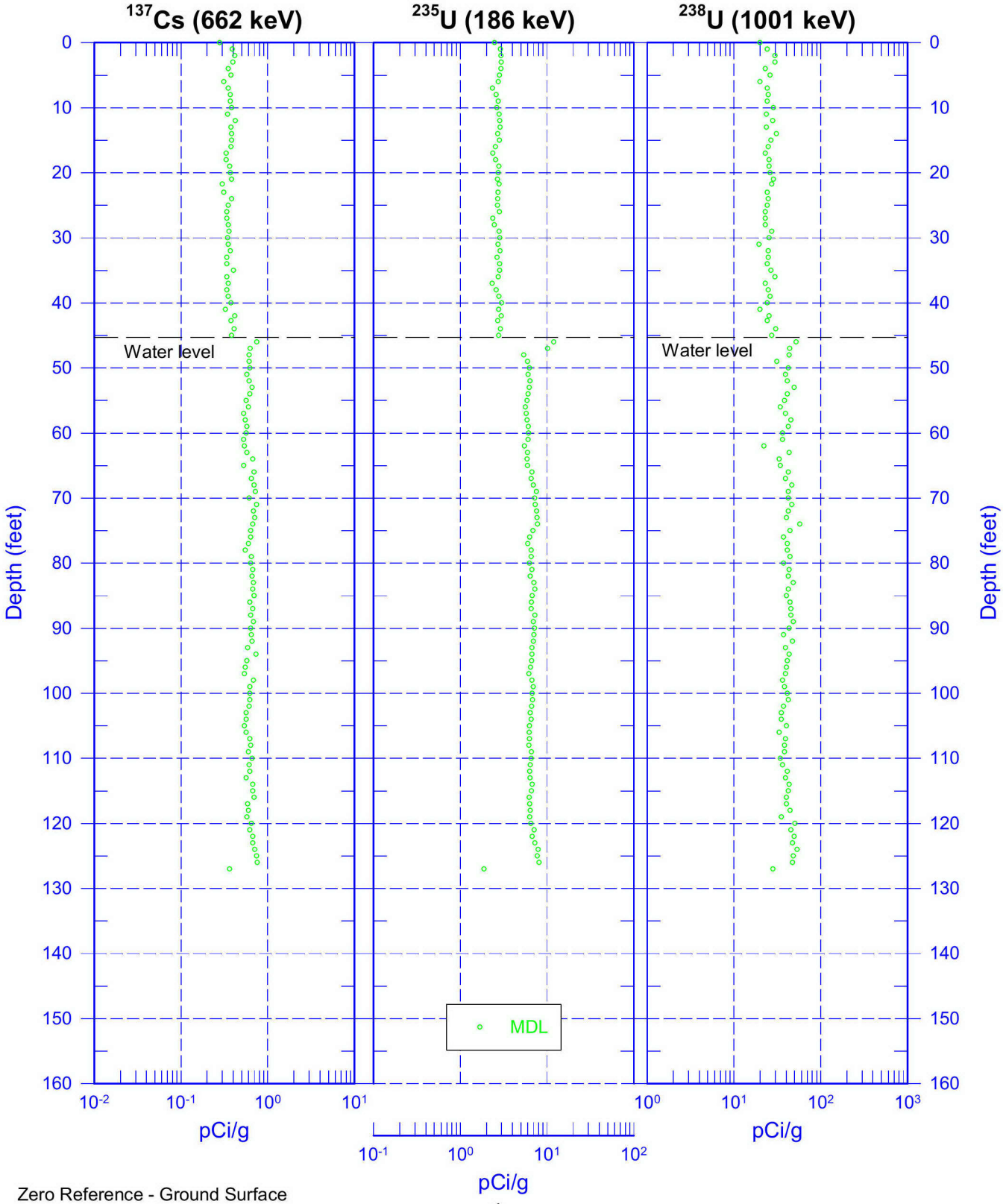
Depth reference is ground surface

Manmade Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma & Dead Time
Total Gamma & Moisture
Total Gamma & Hanford Gamma Unit
Repeat Section of Natural Gamma Logs (0-5 ft)
Repeat Section of Natural Gamma Logs (70-79 ft)
Moisture Repeat Section

[1] GWL – groundwater level

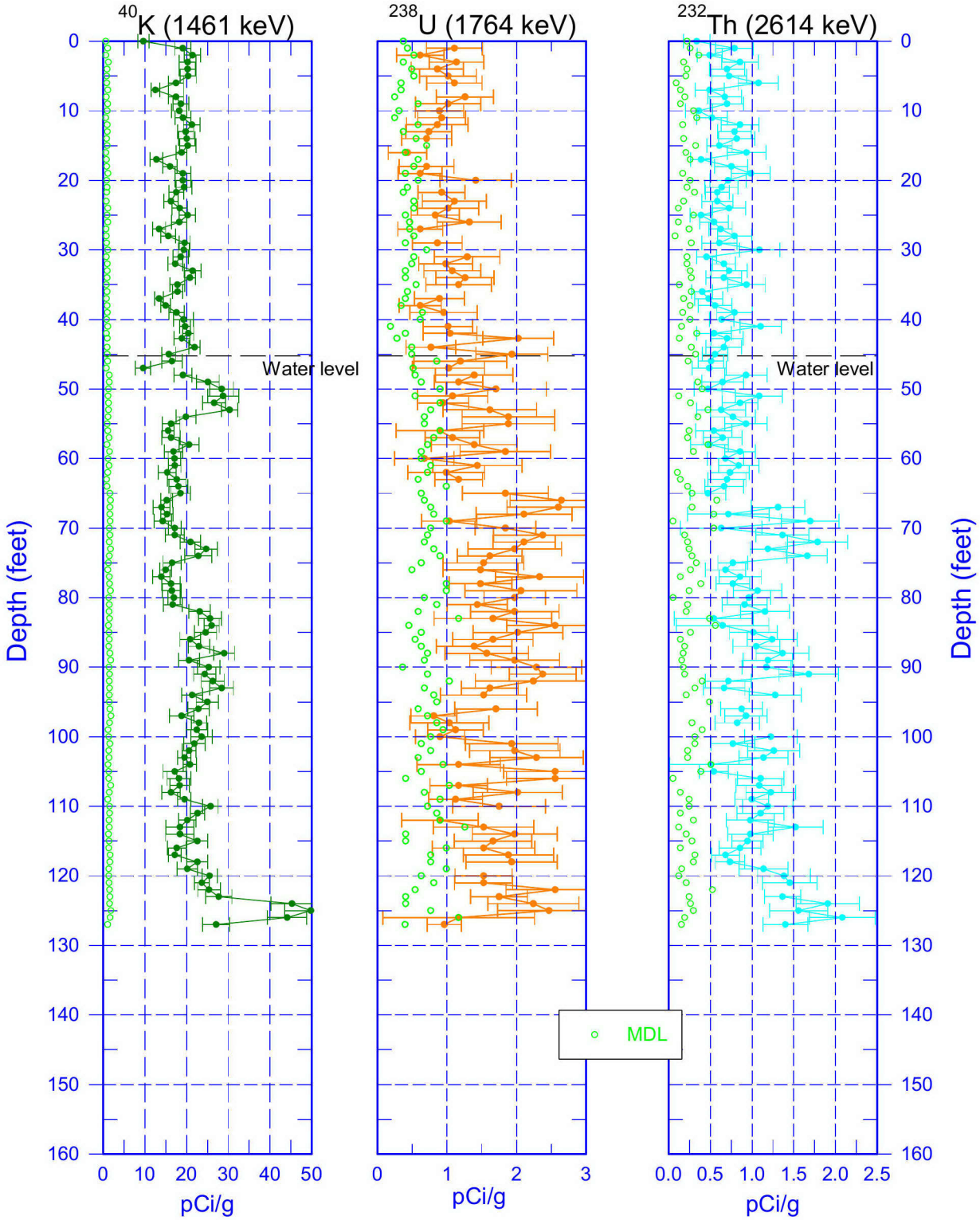
Stoller Hanford Office

399-6-3 (C7658)
Manmade Radionuclides

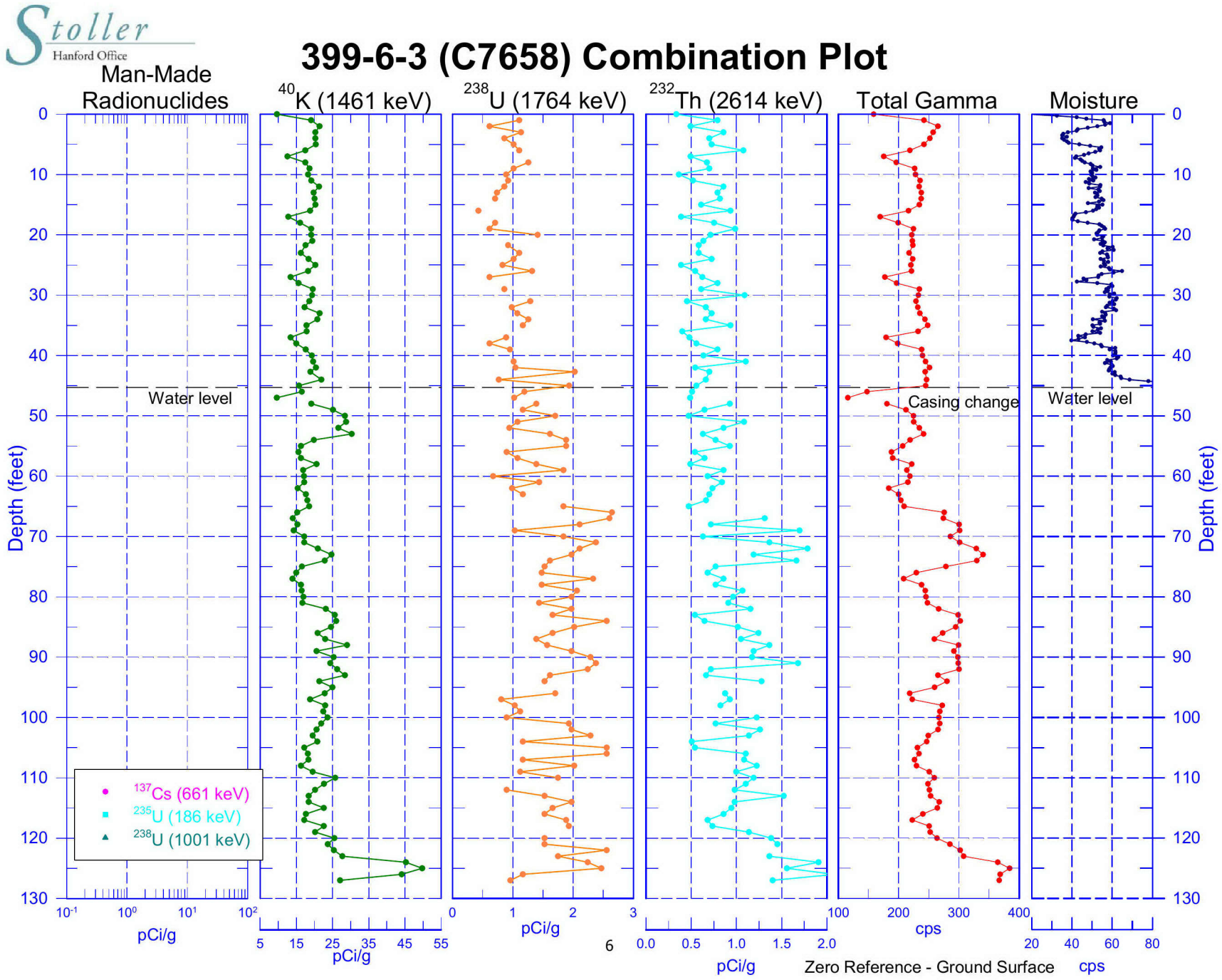


Stoller Hanford Office

399-6-3 (C7658)
Natural Gamma Logs

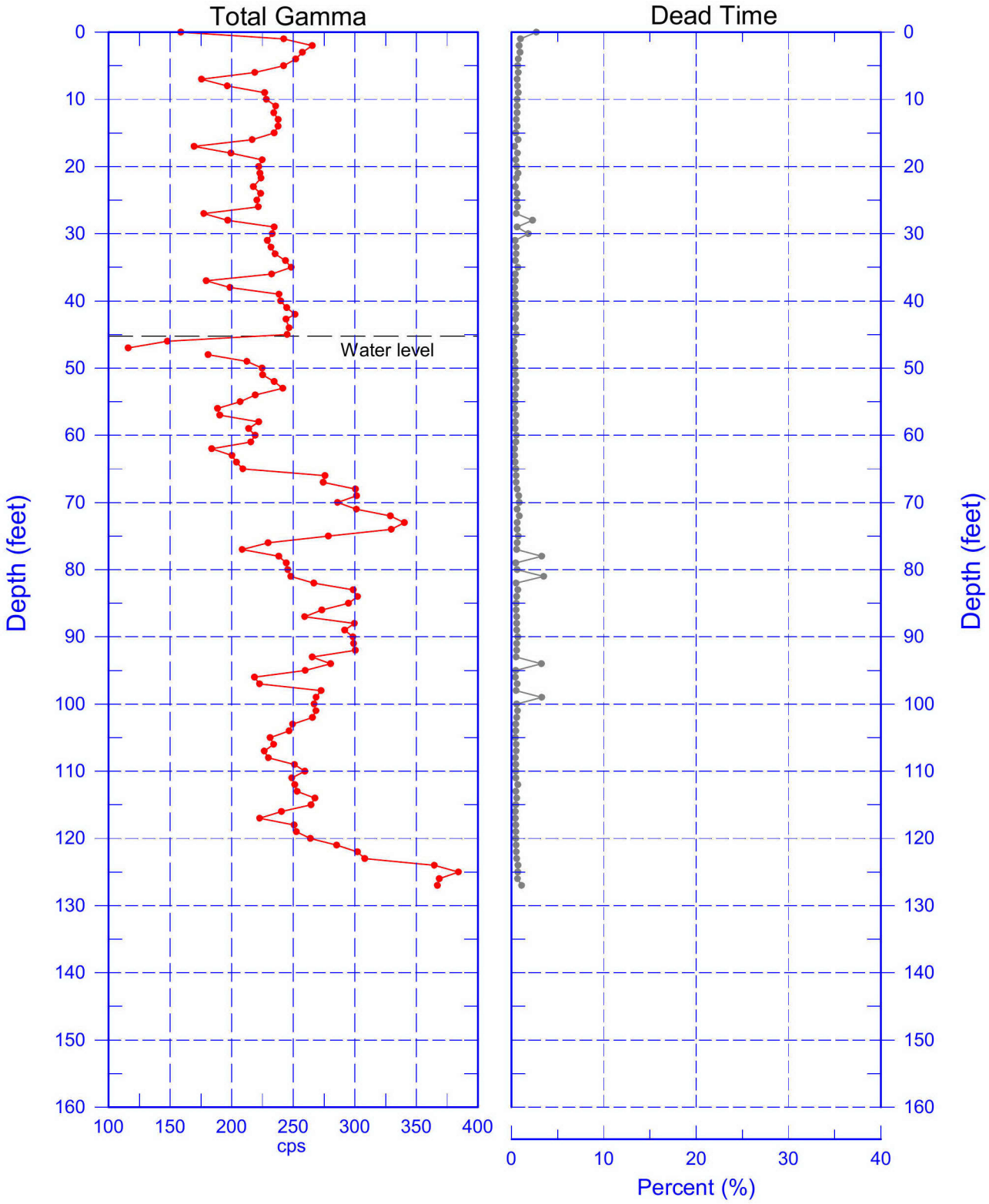


Zero Reference - Ground Surface


Stoller
Hanford Office
399-6-3 (C7658) Combination Plot
Man-Made Radionuclides
40K (1461 keV)
238U (1764 keV)
232Th (2614 keV)
Total Gamma
Moisture
Water level
Casing change
Water level
Depth (feet)
137Cs (661 keV)
235U (186 keV)
238U (1001 keV)
pCi/g
pCi/g
pCi/g
pCi/g
cps
cps
Zero Reference - Ground Surface
6

Stoller
Hanford Office

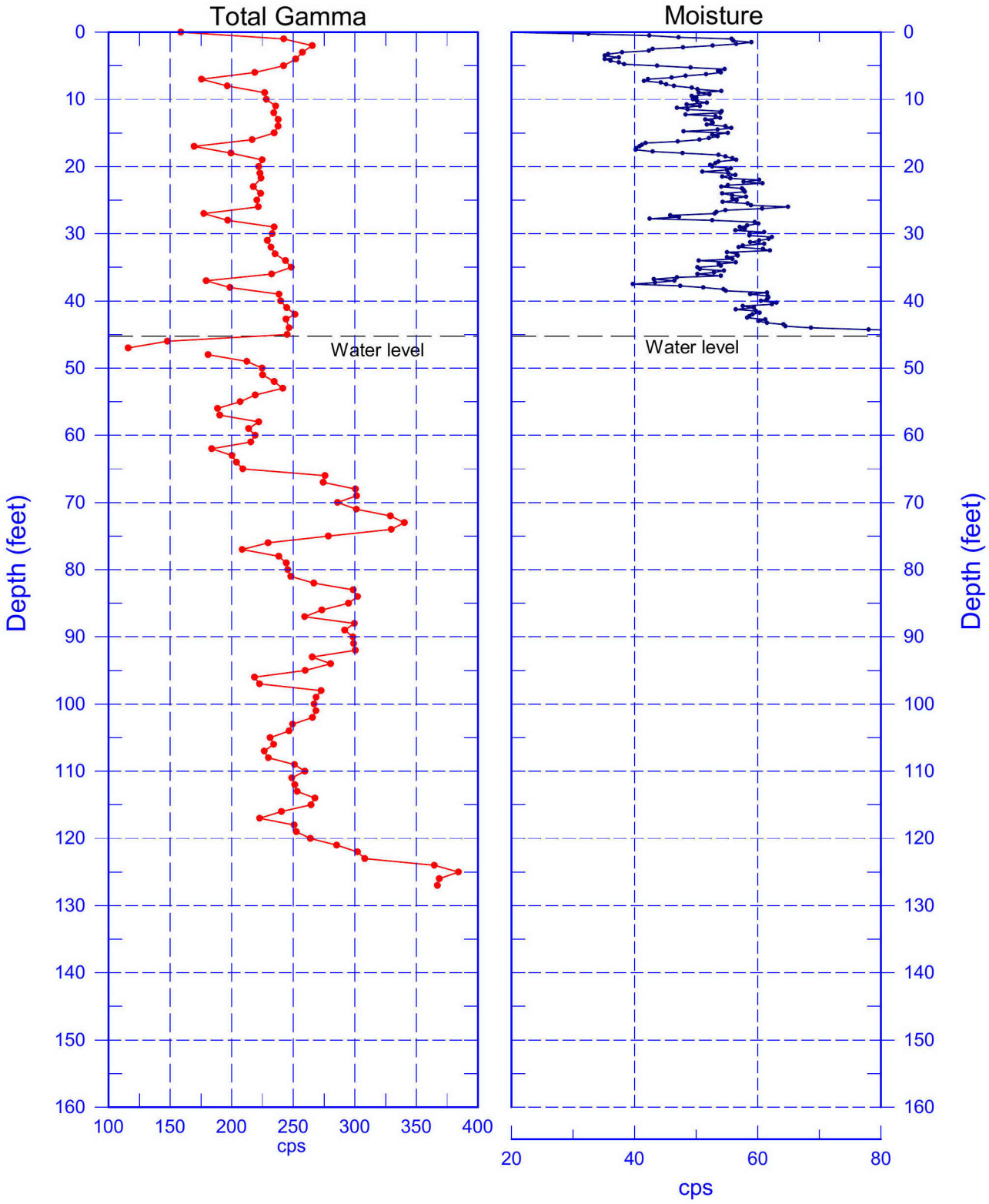
399-6-3 (C7658)
Total Gamma & Dead Time



Reference - Ground Surface

Stoller
Hanford Office

399-6-3 (C7658)
Total Gamma & Moisture

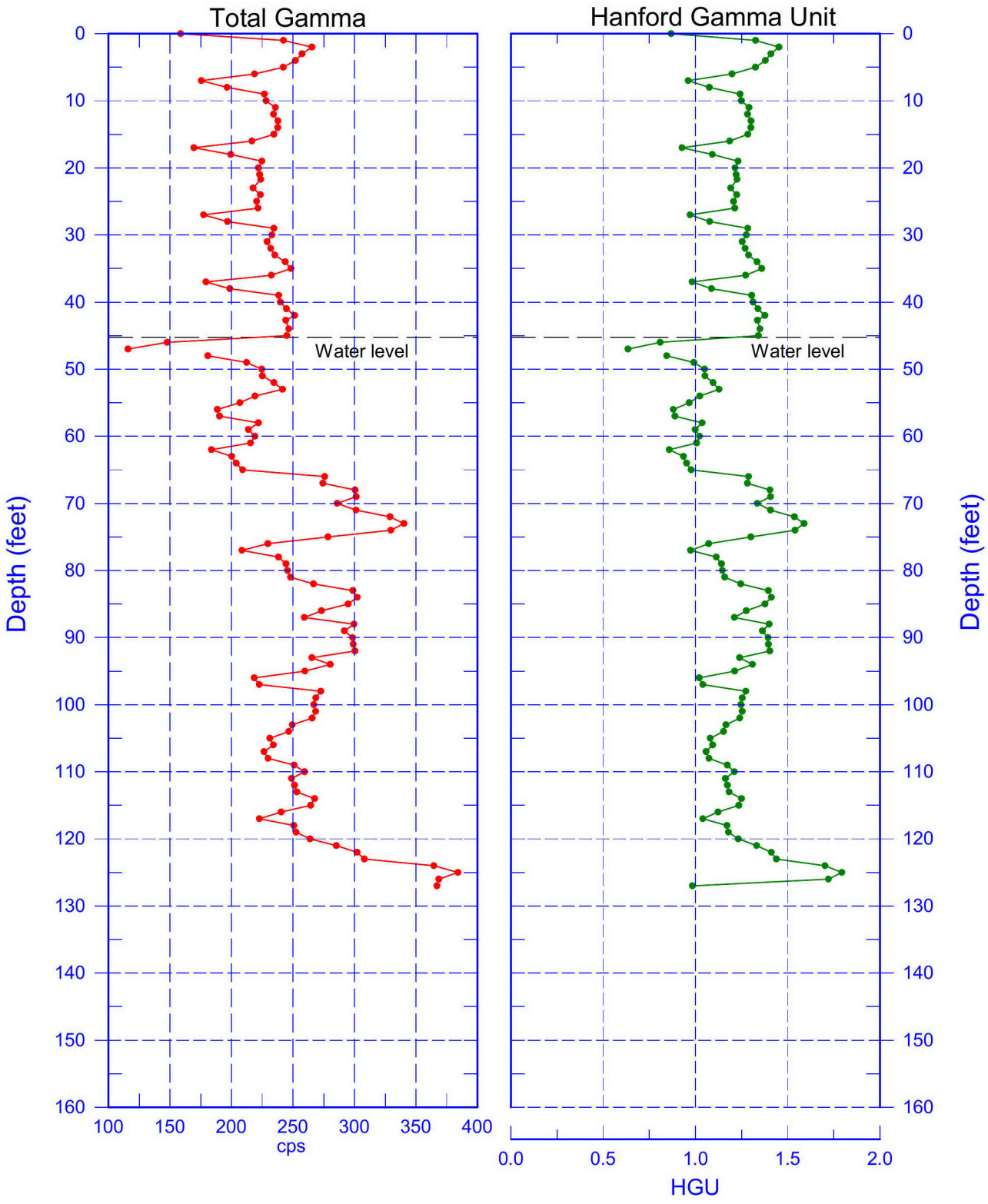


Reference - Ground Surface

Stoller Hanford Office

399-6-3 (C7658)

Total Gamma & Hanford Gamma Unit

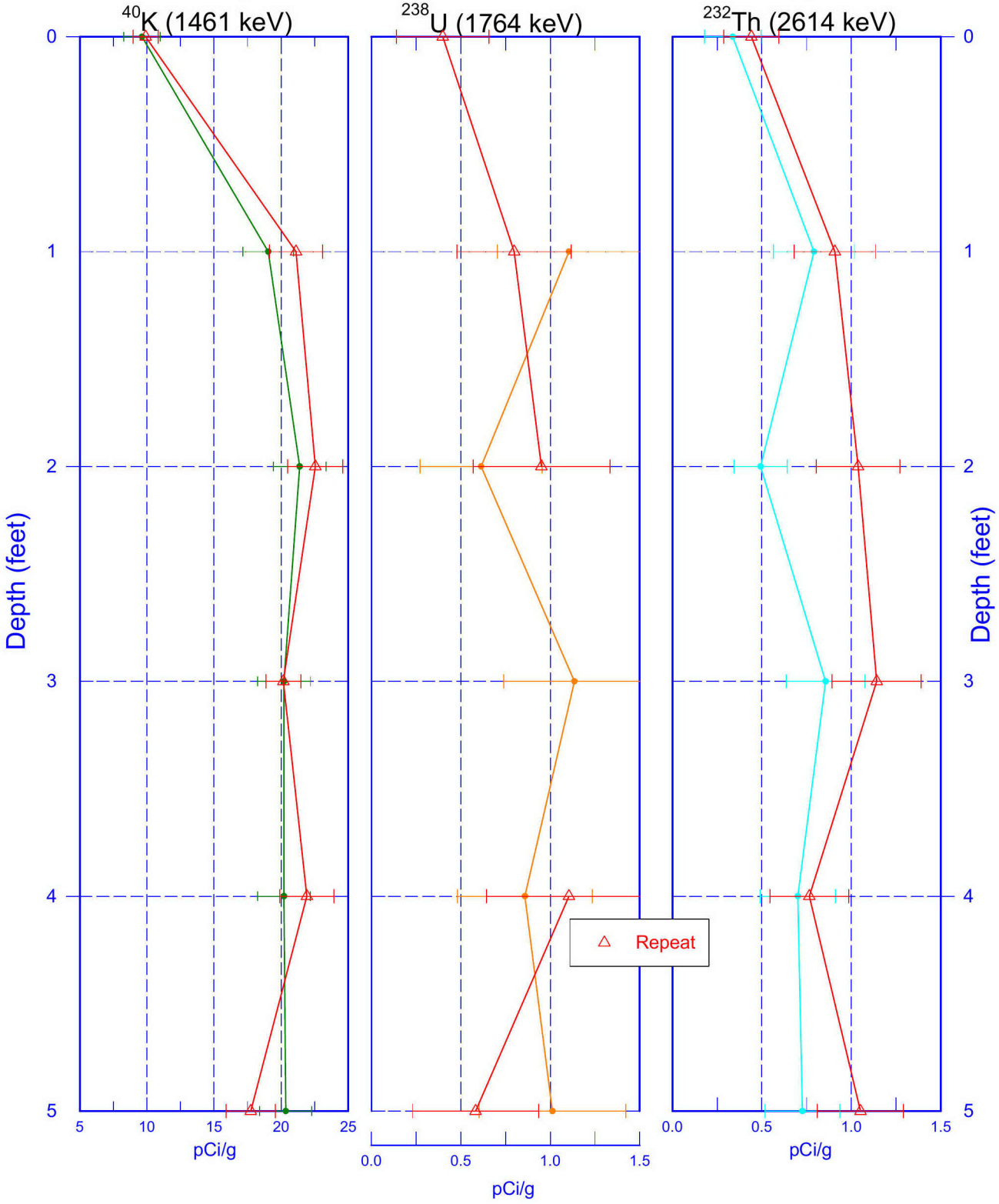


Reference - Ground Surface

Stoller
Hanford Office

399-6-3 (C7658)

Repeat Section of Natural Gamma Logs

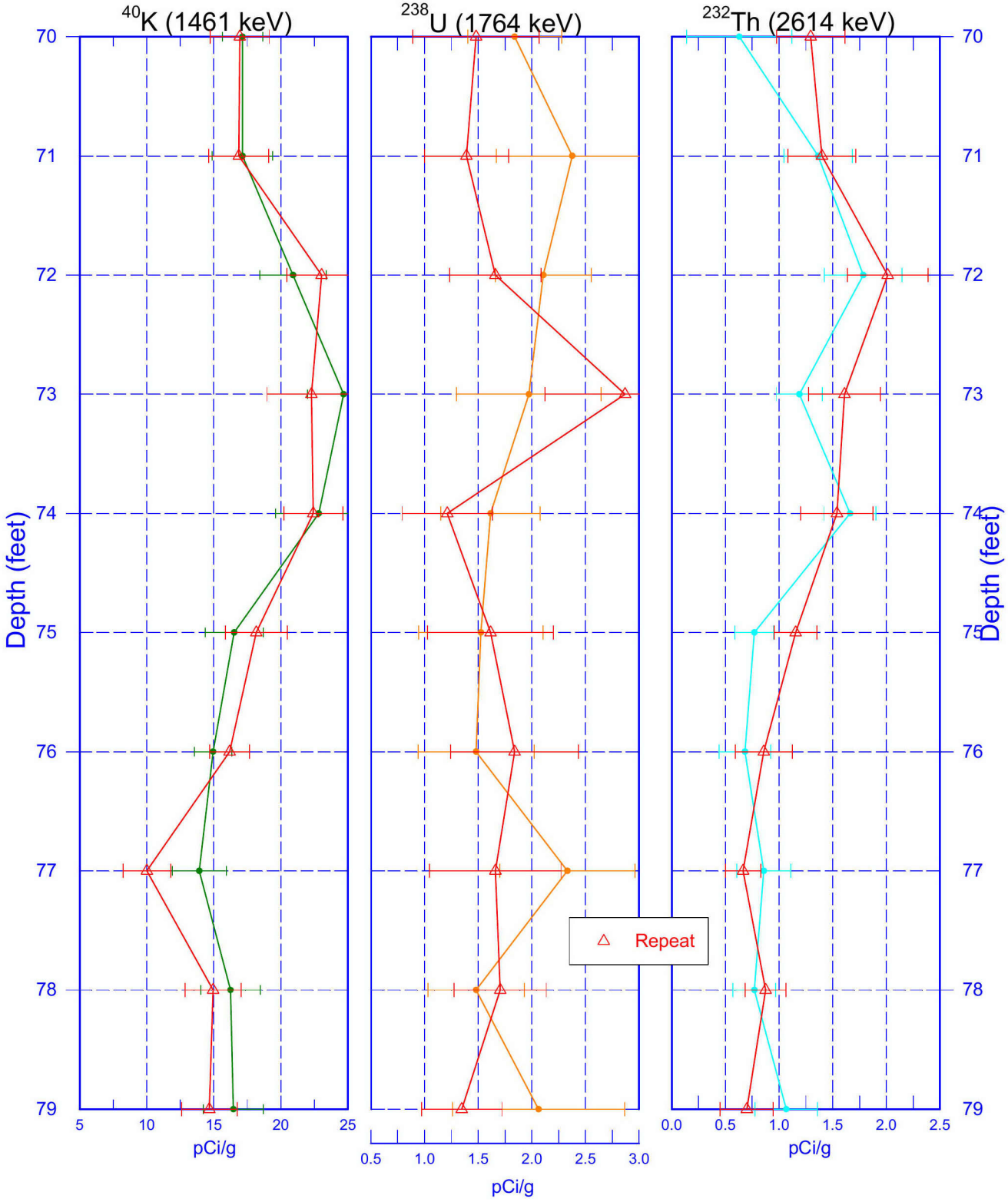


Zero Reference - Ground Surface

Stoller
Hanford Office

399-6-3 (C7658)

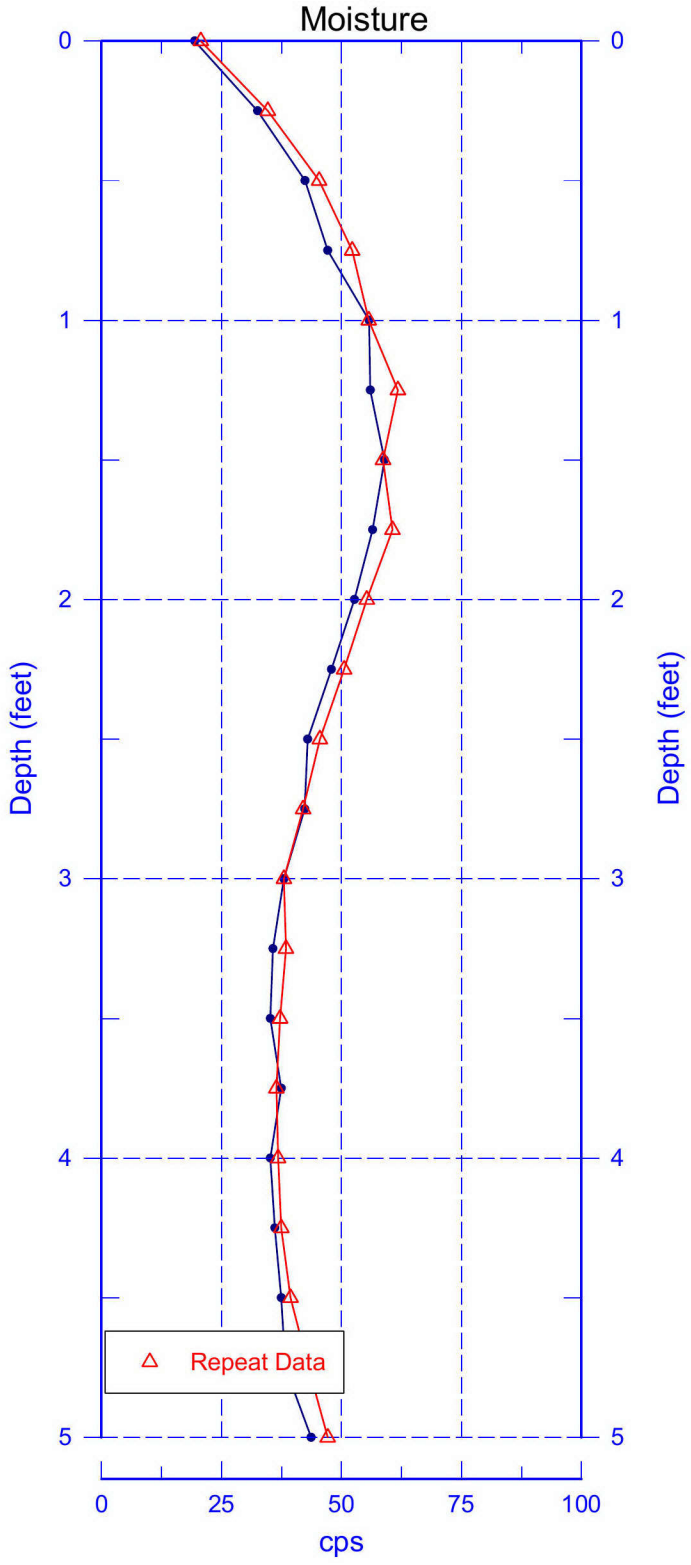
Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Stoller
Hanford Office

399-6-3 (C7658)
Moisture Repeat Section



Reference - Ground Surface

Stoller Hanford Office established 1959

HGLP-LDR-548, Rev. 0

399-1-59 (C7659)
Log Data Report

Borehole Information:

Borehole:	399-1-59 (C7659)		Site:	300-FF-5	
Coordinates (WA St Plane)		GWL[1] (ft):	64.25	GWL Date:	12/15/10
North (m)	East (m)	Drill Date	TOC Elevation	Total Depth (ft)	Type
Unknown	Unknown	12/10/10	Unknown	148.7	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded steel	2.5	12	10 7/8	9/16	2.5	47.5
Threaded steel	3.8	10 ½	9 5/8	7/16	3.8	146.2

Borehole Notes:

The total depth and casing depths were reported by the Buyer's Technical Representative. The logging engineer measured casing diameter rounding to the nearest 1/16-in. Water level was measured to be 64.25 ft on December 15, 2010 using log data during analysis.

Zero reference is ground surface.

Spectral Gamma Logging System (SGLS) Equipment Information:

Logging System:	Gamma 4L		Type:	(60%) HPGe SGLS SN: 47-TP32211A
Effective Calibration Date:	1/20/10	Calibration Reference:	HGLP-CC-054	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Neutron Moisture Logging System (NMLS) Equipment Information:

Logging System:	Gamma 4M		Type:	NMLS SN: H340207279
Effective Calibration Date:	1/18/10	Calibration Reference:	HGLP-CC-052	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat	5	6 Repeat	
HEIS number	1017336	1017337	1017338	1017339	
Date	12/10/10	12/10/10	12/15/10	12/15/10	
Logging Engineer	Pearson	Pearson	Holloway/ McClellan	Holloway/ McClellan	
Start Depth (ft)	48.0	10.0	47.0	146.0	
Finish Depth (ft)	0.0	5.0	146.0	136.0	
Count Time (sec)	100	100	100	100	
Live/Real	R	R	R	R	
Shield (Y/N)	N	N	N	N	
MSA Interval (ft)	1.0	1.0	1.0	1.0	
Log Speed (ft/min)	N/A	N/A	N/A	N/A	
Pre-Verification	DLI01CAB	DLI01CAB	DLI41CAB	DLI41CAB	
Start File	DLI01000	DLI01049	DLI41000	DLI41100	
Finish File	DLI01048	DLI01054	DLI41099	DLI41110	
Post-Verification	DLI01CAA	DLI01CAA	DLI41CAA	DLI41CAA	
Depth Return Error (in.)	0.0	1/2 low	N/A	1 low	

Log Run	1	2 Repeat	5	6 Repeat	
Comments	No fine-gain adjustments made	No fine-gain adjustments made	No fine-gain adjustments made	No fine-gain adjustments made	

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	3	4 Repeat	7	8 Repeat	
HEIS number	1017340	1017341	1017342	1017343	
Date	1210/10	12/10/10	12/15/10	12/15/10	
Logging Engineer	Pearson	Pearson	Holloway/ McClellan	Holloway/ McClellan	
Start Depth (ft)	0.0	43.0	47.0	61.0	
Finish Depth (ft)	48.0	48.0	64.25	64.0	
Count Time (sec)	15	15	15	15	
Live/Real	R	R	R	R	
Shield (Y/N)	N	N	N	N	
MSA Interval (ft)	0.25	0.25	0.25	0.25	
Log Speed (ft/min)	N/A	N/A	N/A	N/A	
Pre-Verification	DMT22CAB	DMT22CAB	DMT62CAB	DMT62CAB	
Start File	DMT22000	DMT22193	DMT62000	DMT62070	
Finish File	DMT22192	DMT22213	DMT62069	DMT62082	
Post-Verification	DMT22CAA	DMT22CAA	DMT62CAA	DMT62CAA	
Depth Return Error (in.)	N/A	0.0	N/A	0.0	
Comments	None	None	None	None	

Logging Operation Notes:

SGLS data were collected using Gamma 4 HO 68B-3573. Pre- and post-survey verification measurements were acquired in the Amersham KUTh-115 field verifier. A centralizer was installed on the sonde.

NMLS data were collected using Gamma 4 HO 68B-3573. Pre- and post-survey verification measurements were acquired in the AmBe standard field verifier. A centralizer was installed on the sonde.

Analysis Notes:

Analyst:	C. Nelson	Date:	1/24/11	Reference:	HGLP-MAN-003, Rev. 0

The pre- and post-survey verification measurements met the acceptance criteria for the established systems.

Casing correction for 9/16-in. thick casing was applied during analysis from ground surface to 48 ft, and 7/16-in. thick casing from 49-146 ft

A water correction was applied from 65 ft to the total logged depth of the borehole.

SGLS spectra were processed in batch mode in APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated in EXCEL template identified as DL20100120, using efficiency functions and corrections for casing and dead time as determined by the systems' annual calibration.

During routine processing of gamma spectra, regions of interest are forced at specific energy levels associated with natural and manmade radionuclides that are anticipated to be present. This processing approach sometimes results in an isolated "detection" near the Minimum Detection Level (MDL) resulting in a false positive. Where these detections occur, the individual spectrum is scrutinized and a determination is made regarding the validity of the detection. If the detection is deemed not representative of a full energy peak, or if confirming peaks are not detected, it is removed from the data set. The integrity of the raw data files and the processed files are maintained should questions arise in the future regarding these determinations.

NMLS data are represented in counts per second (cps) because no calibration data exists for 9 5/8-in. and 10 7/8-in. diameter boreholes.

Stoller Hanford Office established 1959

HGLP-LDR-548, Rev. 0

The Hanford Gamma Unit (HGU) is an empirical unit of gamma activity proposed as a means to standardize gamma log response across multiple logging systems with different response characteristics. The HGU is defined in terms of measurements in the Hanford Borehole Calibration Facility, and the magnitude is selected such that 1 HGU is approximately equivalent to typical Hanford background activity, based on data from background samples as reported in *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12).

Results and Interpretations:

No manmade radionuclides were detected in this borehole. The MDLs for Cs-137, U-235, and U-238 are plotted on the Manmade Radionuclide plot.

The neutron moisture log primarily responds to moisture present in the surrounding formation. In general, an increase in count rate reflects an increase in moisture content. Moisture content may increase in sediments of relatively high silt or clay content.

The KUT and moisture repeat plots indicate that the respective systems were working properly.

List of Plots:

Depth reference is ground surface

Manmade Radionuclides
Natural Gamma Logs
Combination Plot (2 pages)
Combination Plot (0-150 ft)
Total Gamma & Dead Time
Total Gamma & Moisture
Total Gamma & Hanford Gamma Unit
Repeat Section of Natural Gamma Logs (5-10 ft)
Repeat Section of Natural Gamma Logs (136-146 ft)
Moisture Repeat Section (43-48 ft)
Moisture Repeat Section (61-64 ft)

[1] GWL – groundwater level

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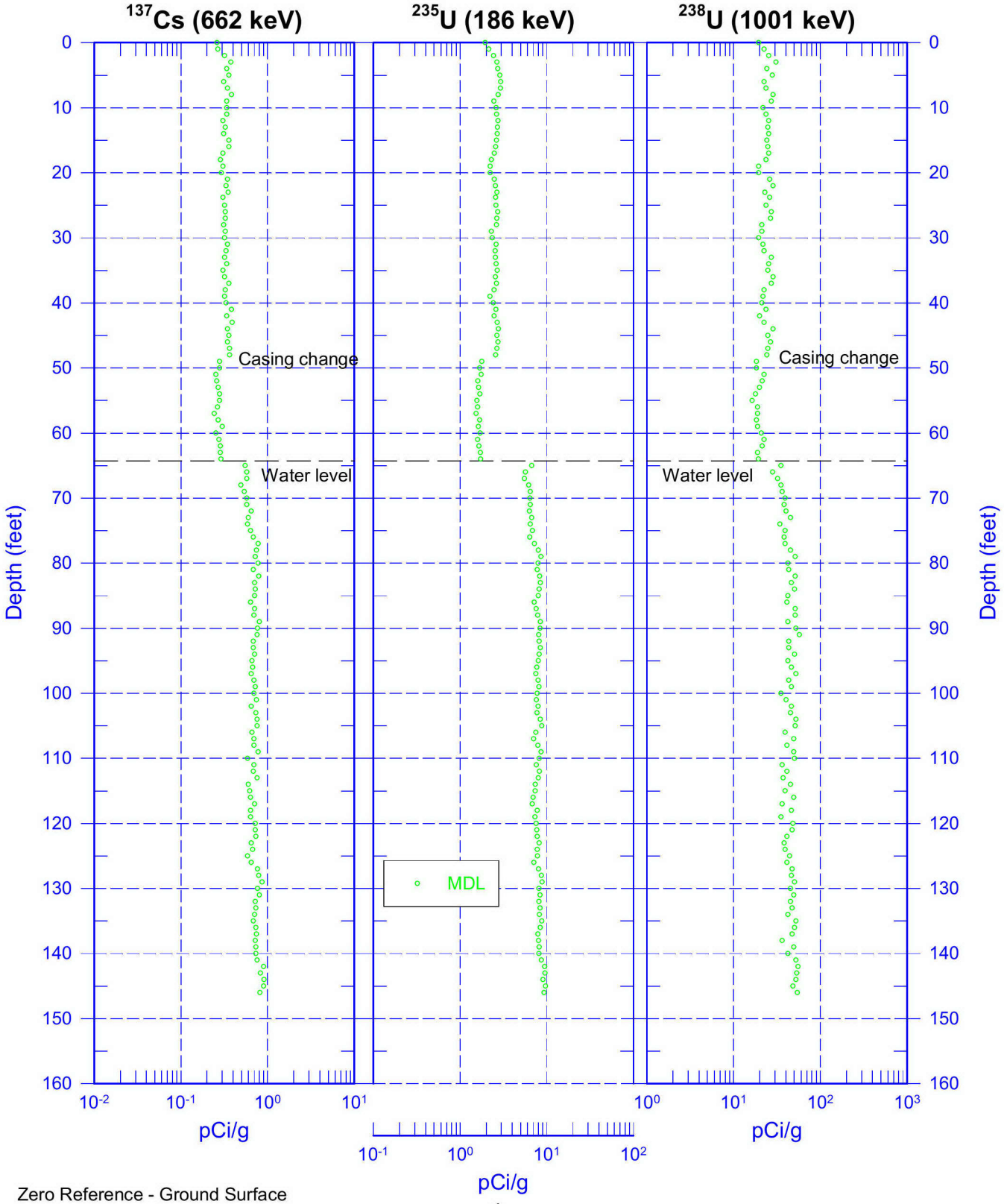
399-1-59 (C7659)
Manmade Radionuclides



Zero Reference - Ground Surface

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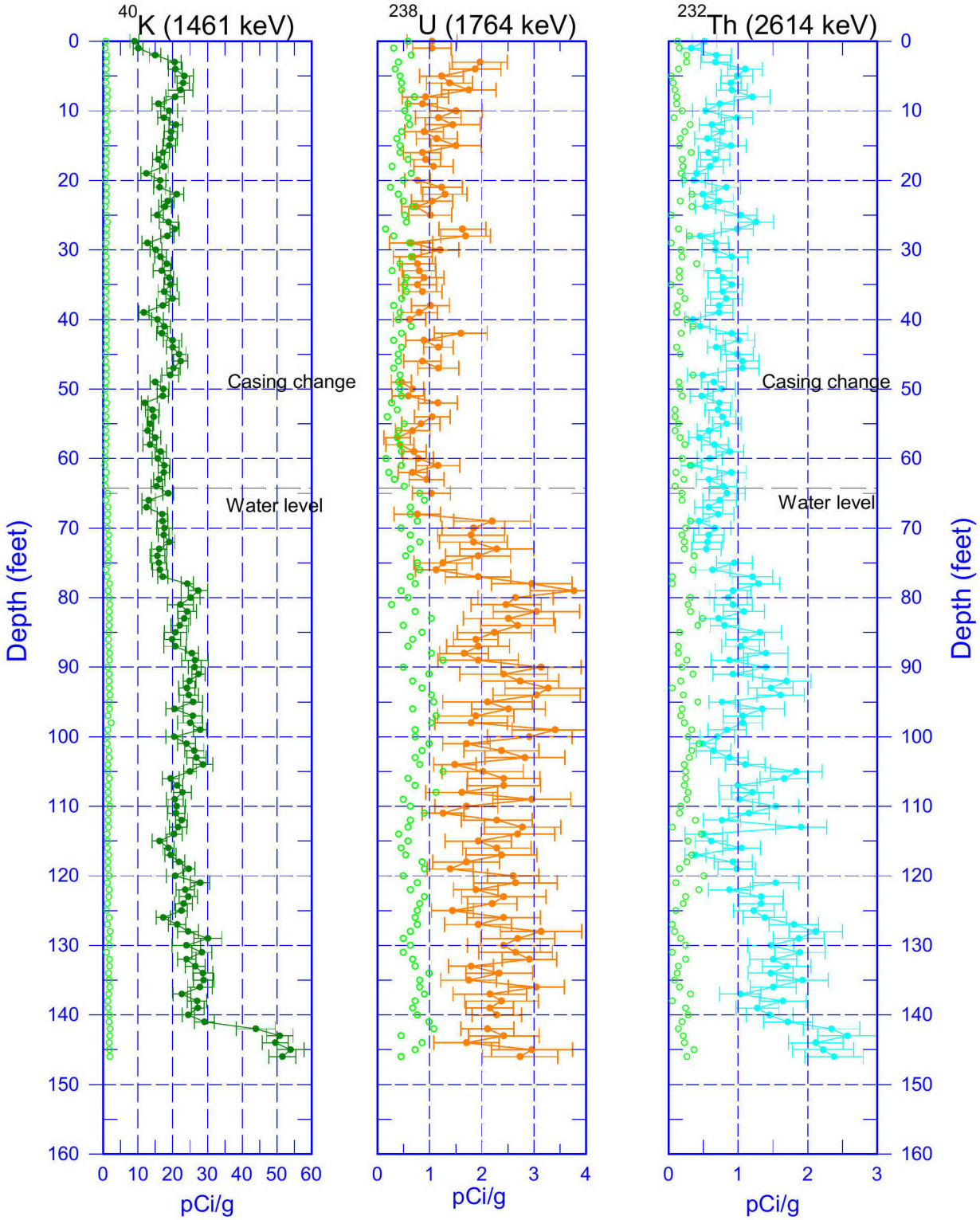
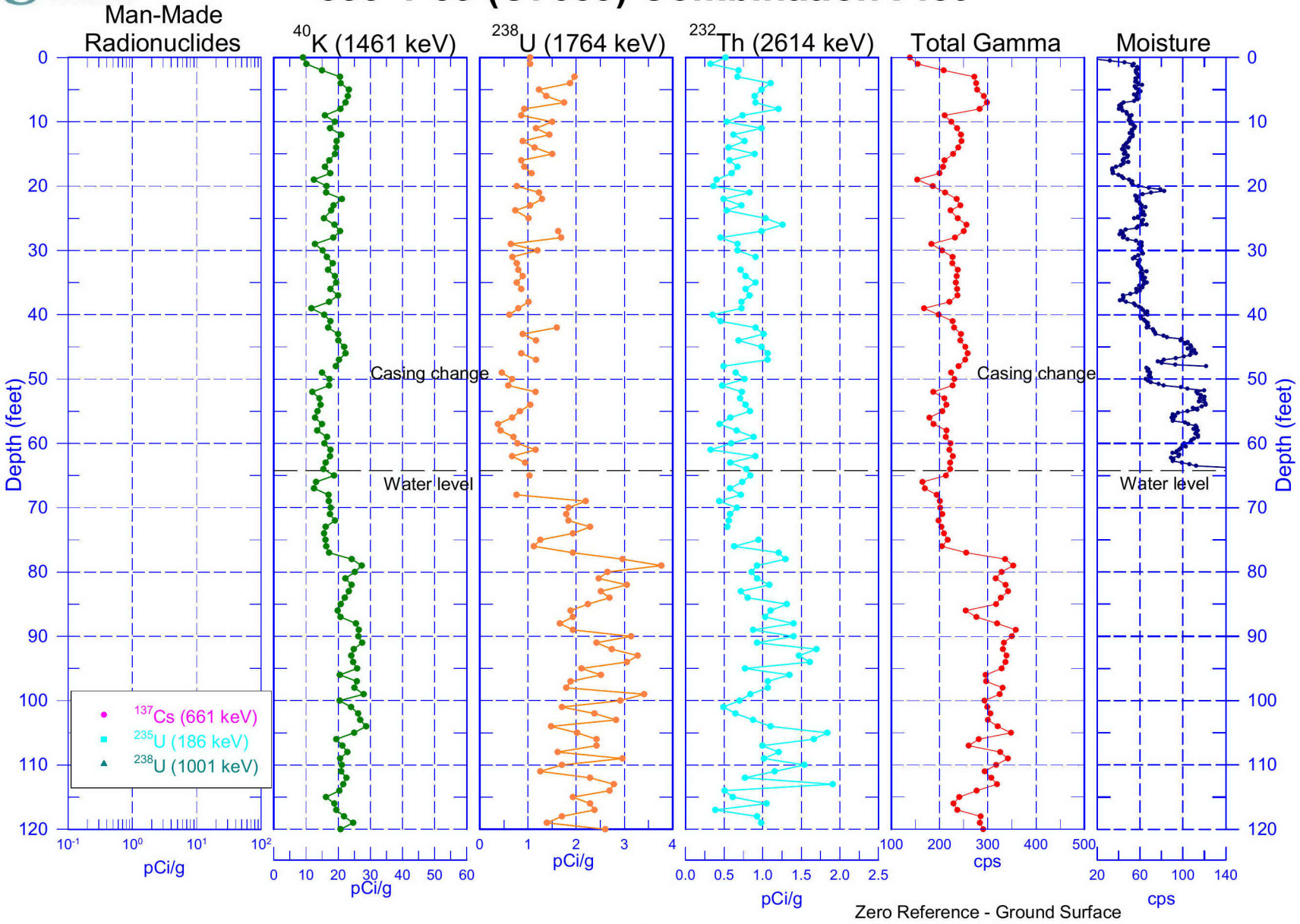
399-1-59 (C7659)
Natural Gamma Logs



Zero Reference - Ground Surface

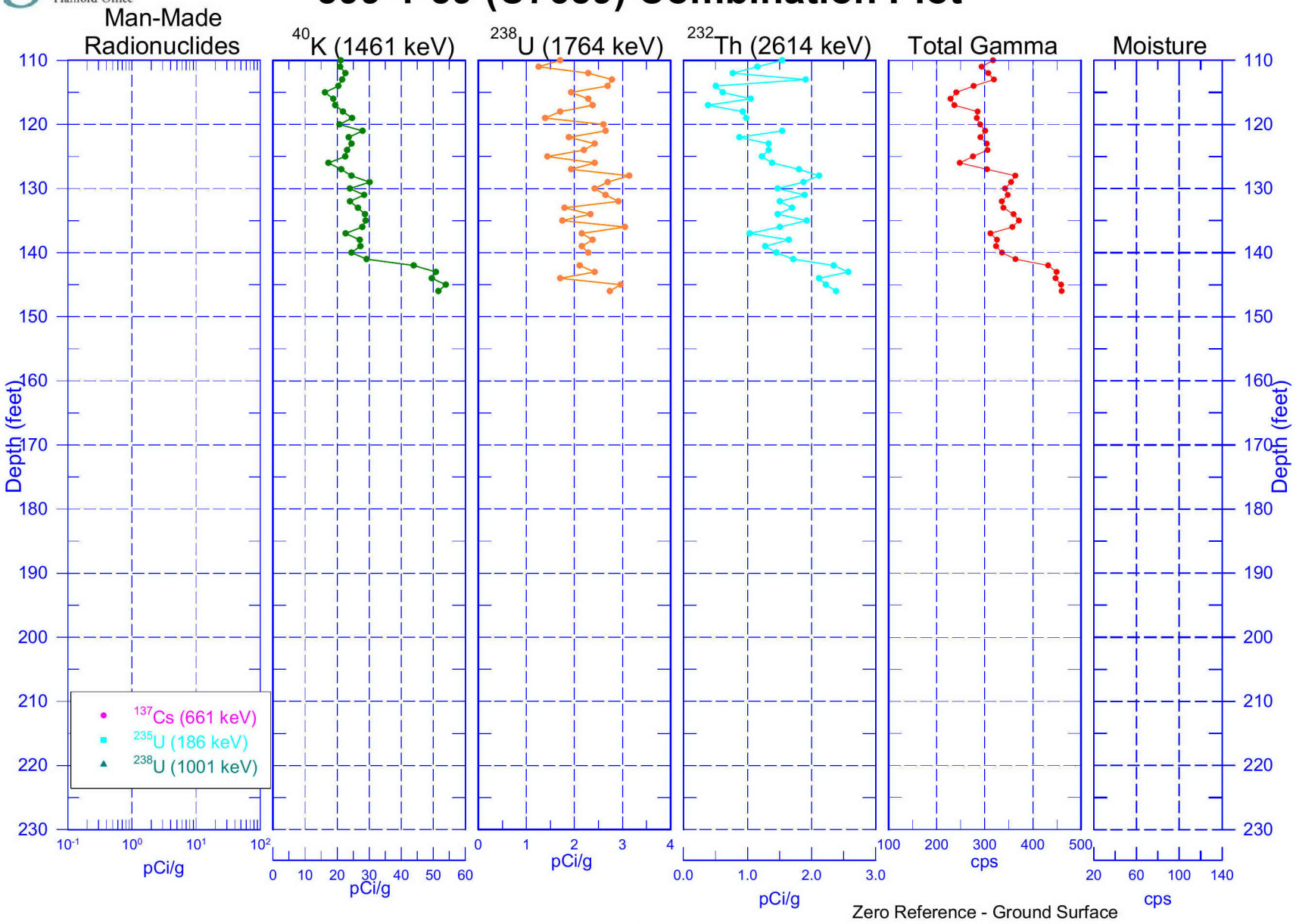
Stoller
Hanford Office

399-1-59 (C7659) Combination Plot



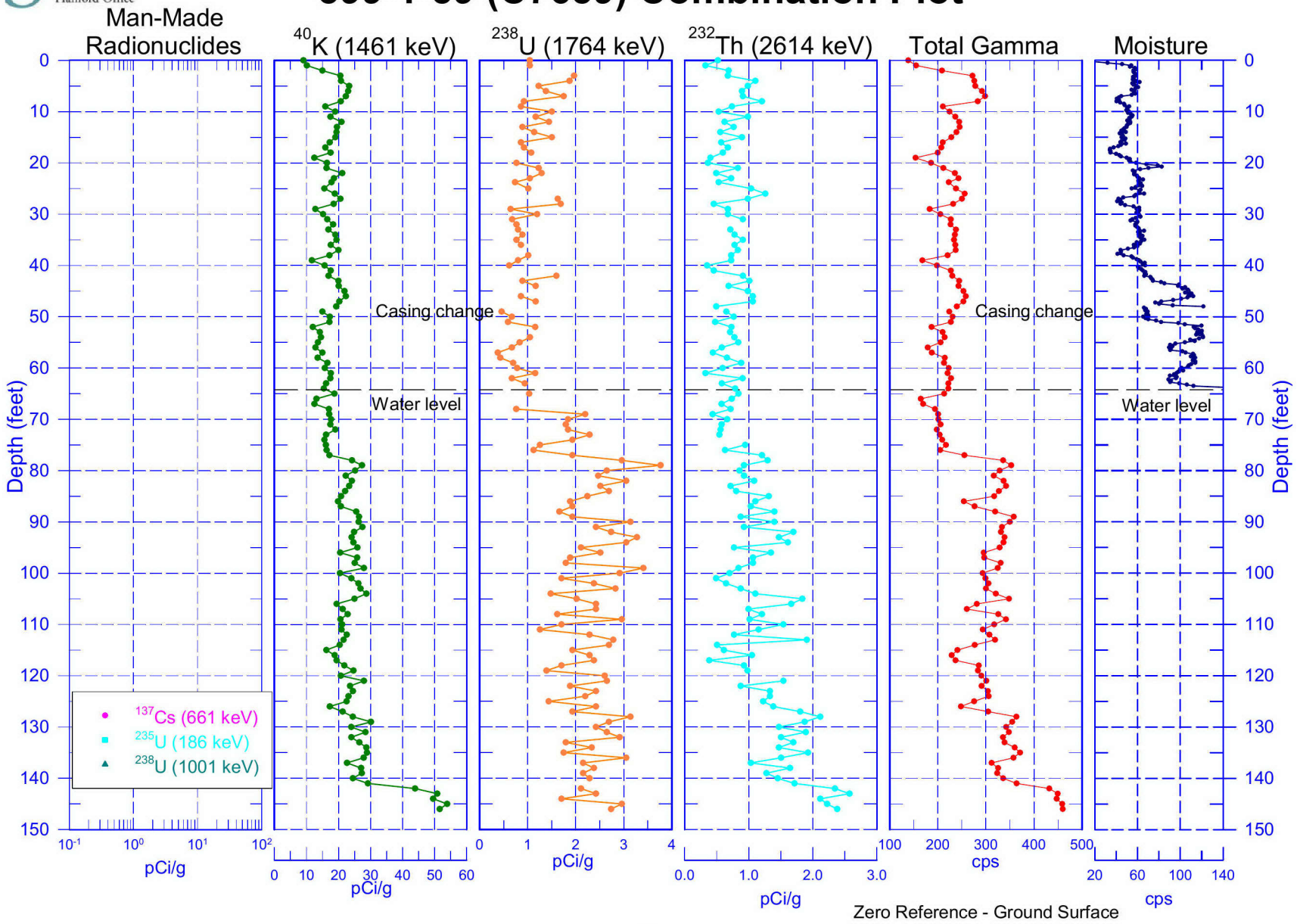
Stoller
Hanford Office

399-1-59 (C7659) Combination Plot



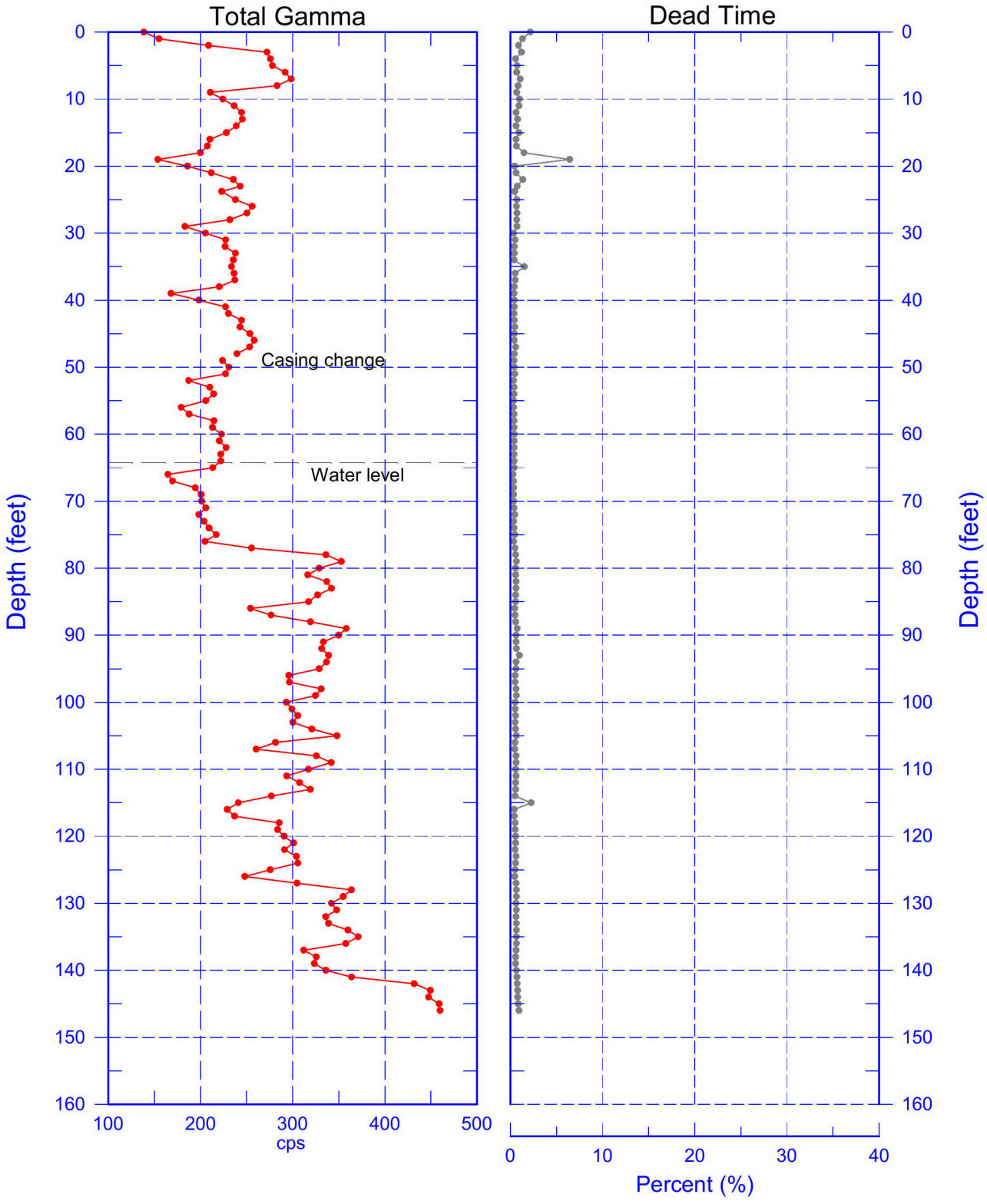
Stoller
Hanford Office

399-1-59 (C7659) Combination Plot



Stoller
Hanford Office

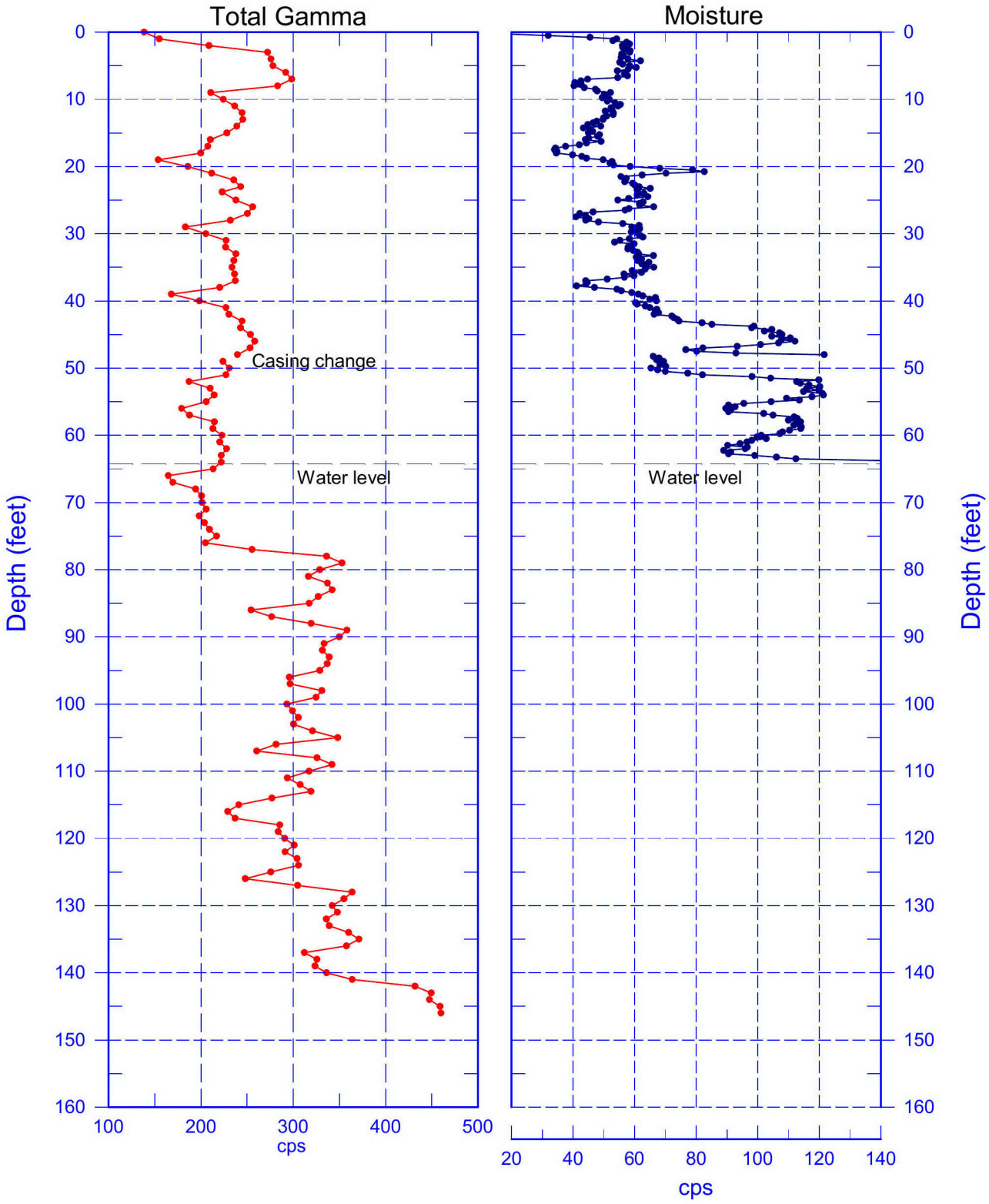
399-1-59 (C7659)
Total Gamma & Dead Time



Reference - Ground Surface

Stoller
Hanford Office

399-1-59 (C7659)
Total Gamma & Moisture

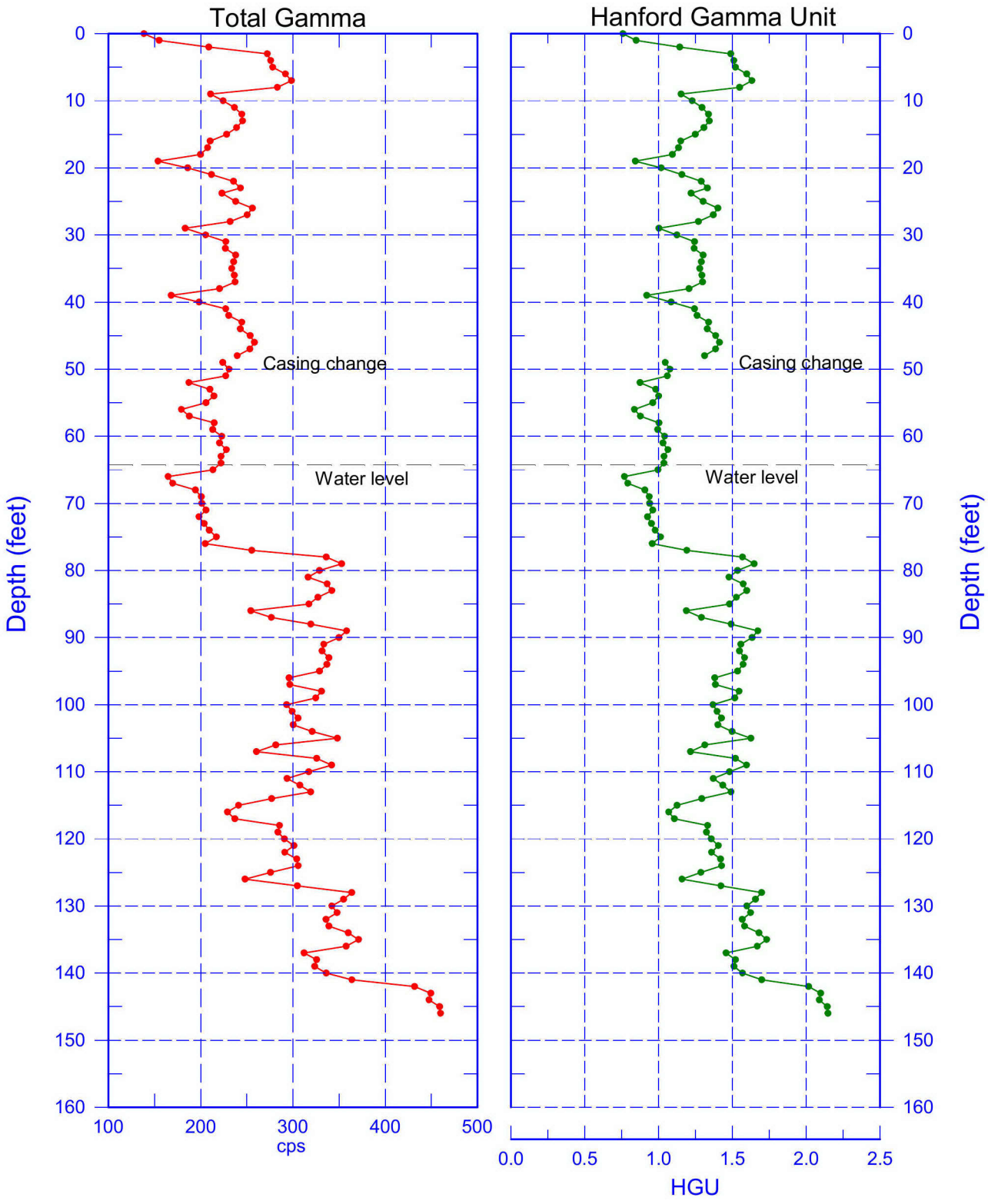


Reference - Ground Surface

Stoller Hanford Office

399-1-59 (C7659)

Total Gamma & Hanford Gamma Unit

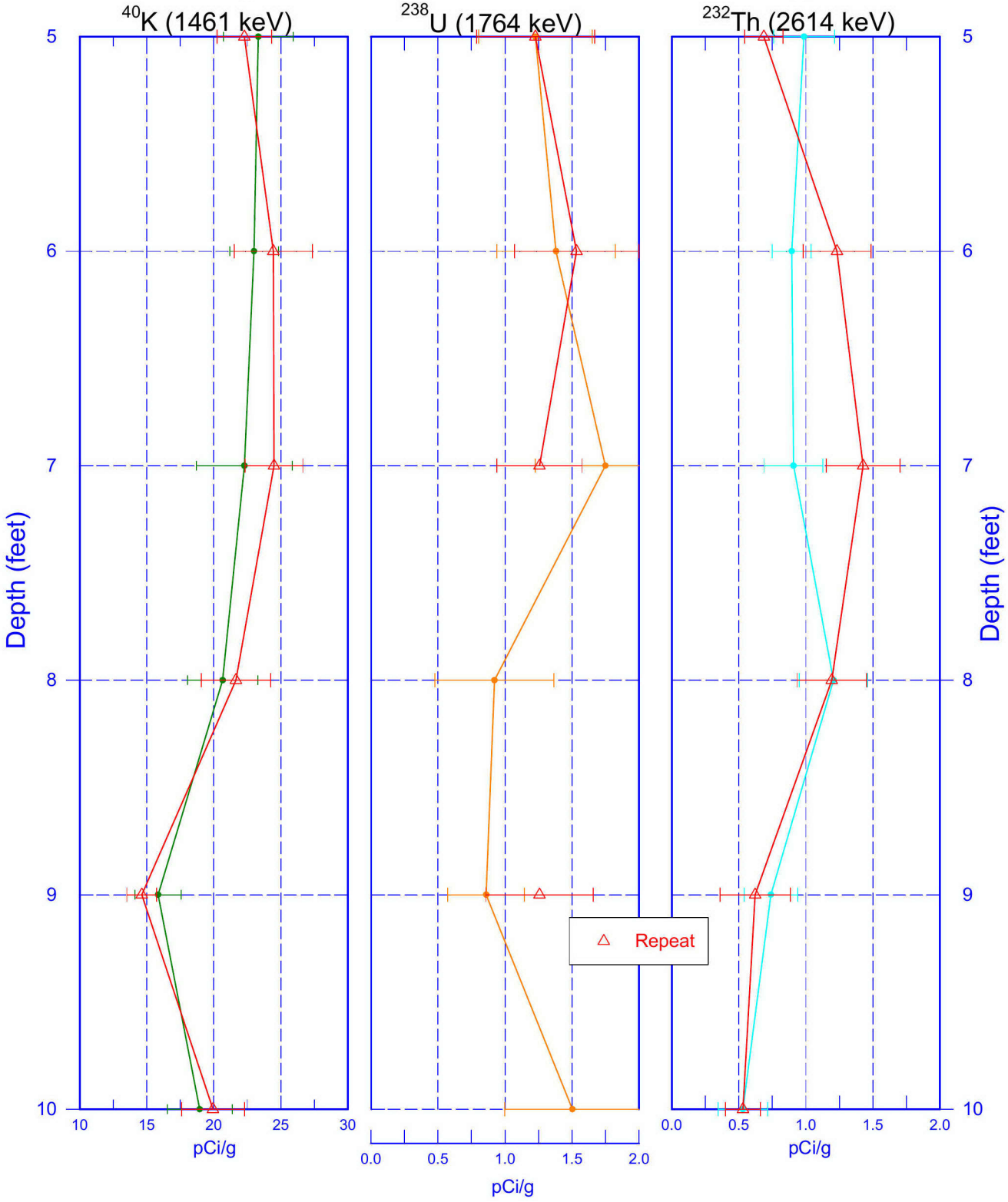


Reference - Ground Surface

Stoller
Hanford Office

399-1-59 (C7659)

Repeat Section of Natural Gamma Logs

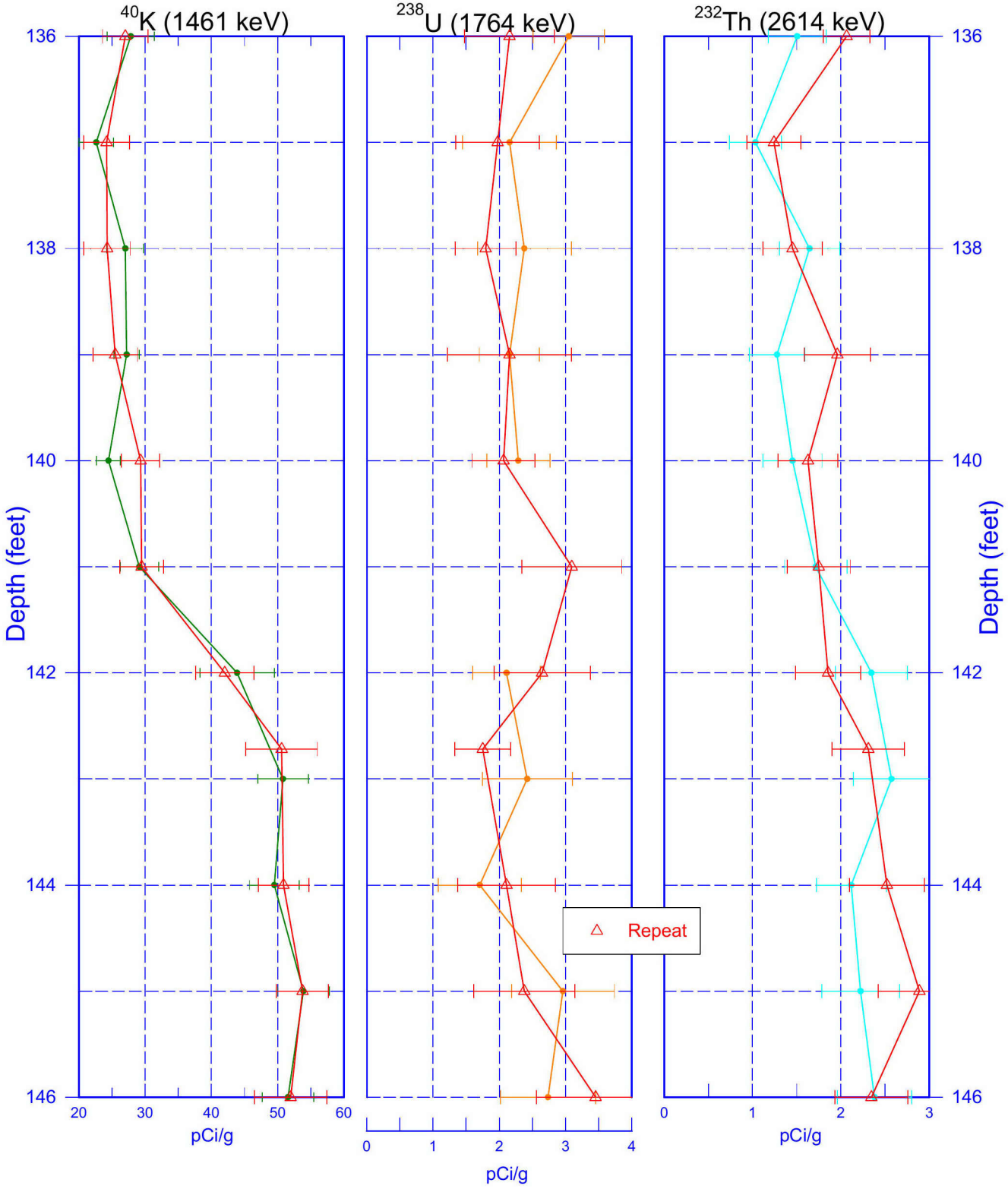


Zero Reference - Ground Surface

Stoller Hanford Office

399-1-59 (C7569)

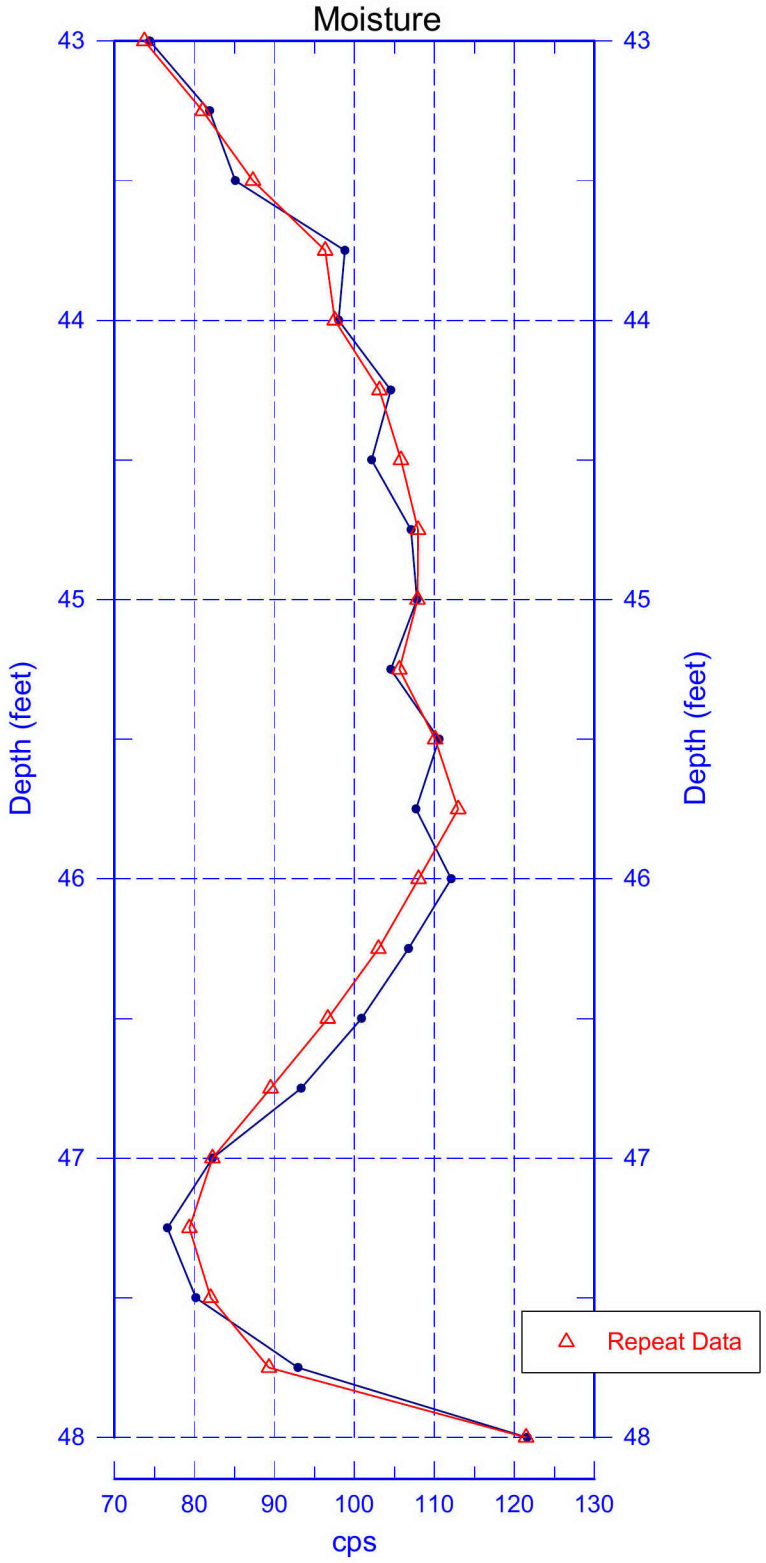
Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Stoller
Hanford Office

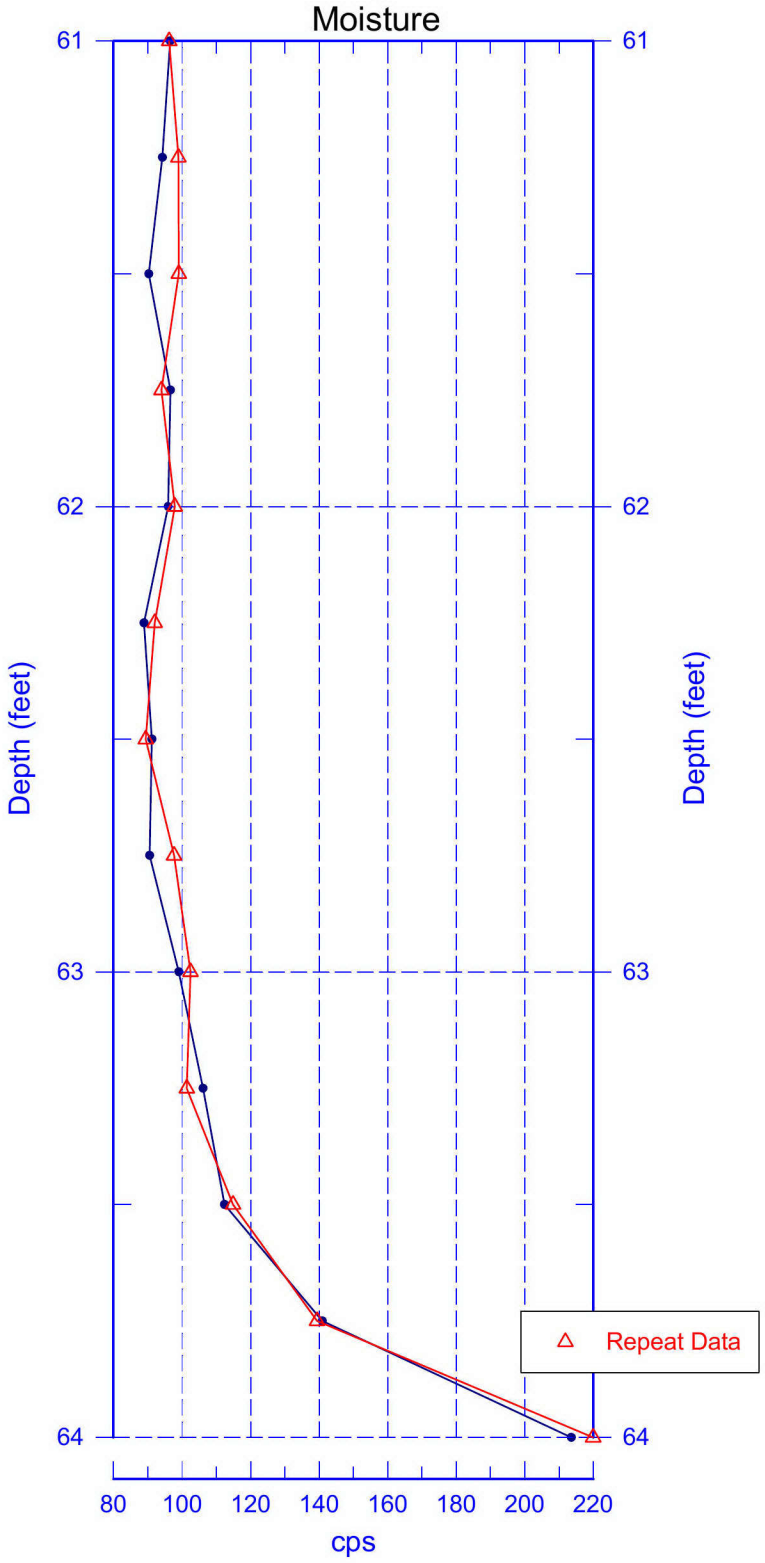
399-1-59 (C7659)
Moisture Repeat Section



Reference - Ground Surface

Stoller
Hanford Office

399-1-59 (C7659)
Moisture Repeat Section



Reference - Ground Surface

Stoller Hanford Office established 1959

HGLP-LDR-523, Rev. 0

399-2-32 (C7660)
Log Data Report

Borehole Information:

Borehole:	399-2-32 (C7660)		Site:	300-FF-5	
Coordinates (WA St Plane)		GWL[1] (ft):	32.5	GWL Date:	11/4/10
North (m)	East (m)	Drill Date	TOC Elevation	Total Depth (ft)	Type
Unknown	Unknown	11/10/10	Unknown	107	Sonic

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded steel	2.8	12	10 7/8	9/16	2.8	47
Threaded steel	3.5	10 ½	9 5/8	7/16	3.5	107

Borehole Notes:

The total depth and casing depths were reported by the Buyer's Technical Representative (BTR), and Geologist. The logging engineer measured casing diameter employing a steel tape and rounding to the nearest 1/16-in.

Zero reference is ground surface.

Spectral Gamma Logging System (SGLS) Equipment Information:

Logging System:	Gamma 4N		Type:	(60%) HPGe SGLS SN: 45TP22010A
Effective Calibration Date:	1/25/10	Calibration Reference:	HGLP-CC-051	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Neutron Moisture Logging System (NMLS) Equipment Information:

Logging System:	Gamma 4M		Type:	NMLS SN: H340207279
Effective Calibration Date:	1/18/10	Calibration Reference:	HGLP-CC-052	
		Logging Procedure:	HGLP-MAN-002, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	3	4 Repeat	5	6 Repeat	
HEIS number	1017294	1017295	1017298	1017299	
Date	11/4/10	11/4/10	11/10/10	11/10/10	
Logging Engineer	McClellan	McClellan	McClellan	McClellan	
Start Depth (ft)	0.0	15.0	46.0	45.0	
Finish Depth (ft)	46.0	20.0	106.0	51.0	
Count Time (sec)	100	100	100	100	
Live/Real	R	R	R	R	
Shield (Y/N)	N	N	N	N	
MSA Interval (ft)	1.0	1.0	1.0	1.0	
Log Speed (ft/min)	N/A	N/A	N/A	N/A	
Pre-Verification	DNE91CAB	DNE91CAB	DNF01CAB	DNF01CAB	
Start File	DNE91000	DNE91047	DNF01000	DNF01061	
Finish File	DNE91046	DNE91052	DNF01060	DNF01067	
Post-Verification	DNE91CAA	DNE91CAA	DNF01CAA	DNF01CAA	
Depth Return Error (in.)	N/A	0	N/A	½ high	
Comments	No fine-gain adjustment	No fine-gain adjustment	No fine-gain adjustment	No fine-gain adjustment	

Stoller Hanford Office established 1959

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	1	2 Repeat			
HEIS number	1017296	1017297			
Date	11/4/10	11/4/10			
Logging Engineer	McClellan	McClellan			
Start Depth (ft)	0.0	0.0			
Finish Depth (ft)	32.5	4.0			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
ft/min	N/A	N/A			
Pre-Verification	DMS02CAB	DMS02CAB			
Start File	DMS02000	DMS02131			
Finish File	DMS02130	DMS02147			
Post-Verification	DMS02CAA	DMS02CAA			
Depth Return Error (in.)	N/A	0			
Comments	None	None			

Logging Operation Notes:

SGLS data were collected using Gamma 4 HO 68B-3573. Pre and post survey verification measurements were acquired in the Amersham KUTH-115 field verifier. A centralizer was installed on the sonde.

NMLS data were collected using Gamma 4 HO 68B-3573. Pre and post survey verification measurements were acquired in the AmBe standard field verifier. A centralizer was installed on the sonde.

Analysis Notes:

Analyst:	C. Nelson	Date:	12/15/10	Reference:	GJO-HGLP 1.6.3, Rev. 0

The pre- and post-survey verification measurements met the acceptance criteria for the established systems.

A casing correction for 9/16-in. casing was applied during analysis from ground surface to 46 ft, and a casing correction for 7/16-in. casing was applied during analysis from 47-106 ft.

A water correction was applied from 32.5 ft to the total logged depth of the borehole.

SGLS spectra were processed in batch mode in APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated in an EXCEL template identified as DN20100125, using efficiency functions and corrections for casing and dead time as determined by the systems annual calibration.

During routine processing of gamma spectra, regions of interest are forced at specific energy levels associated with natural and manmade radionuclides that are anticipated to be present. This processing approach sometimes results in an isolated "detection" near the Minimum Detection Level (MDL) resulting in a false positive. Where these detections occur, the individual spectrum is scrutinized and a determination is made regarding the validity of the detection. If the detection is deemed not representative of a full energy peak, or if confirming peaks are not detected, it is removed from the data set. The integrity of the raw data files and the processed files are maintained should questions arise in the future regarding these determinations.

NMLS data are represented in counts per second (cps) because no calibration data exists for 12-in. and 10-in. diameter boreholes.

The Hanford Gamma Unit (HGU) is an empirical unit of gamma activity proposed as a means to standardize gamma log response across multiple logging systems with different response characteristics. The HGU is defined in terms of measurements in the Hanford Borehole Calibration Facility, and the magnitude is selected such that 1 HGU is approximately equivalent to typical Hanford background activity, based on data from background samples as reported in *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12).

Results and Interpretations:

No manmade radionuclides were detected in this borehole. The MDL's for Cs-137, U-235 and U-238 are plotted on the Manmade Radionuclide plot.

The neutron moisture log primarily responds to moisture present in the surrounding formation. In general, an increase in count rate reflects an increase in moisture content. Moisture content may increase in sediments of relatively high silt or clay content. Casing joints may be alternating gammas and neutrons from the detector at approximately 10-ft intervals.

The KUT and moisture repeat plots indicate that the respective systems were working properly.

List of Plots:

Depth reference is ground surface

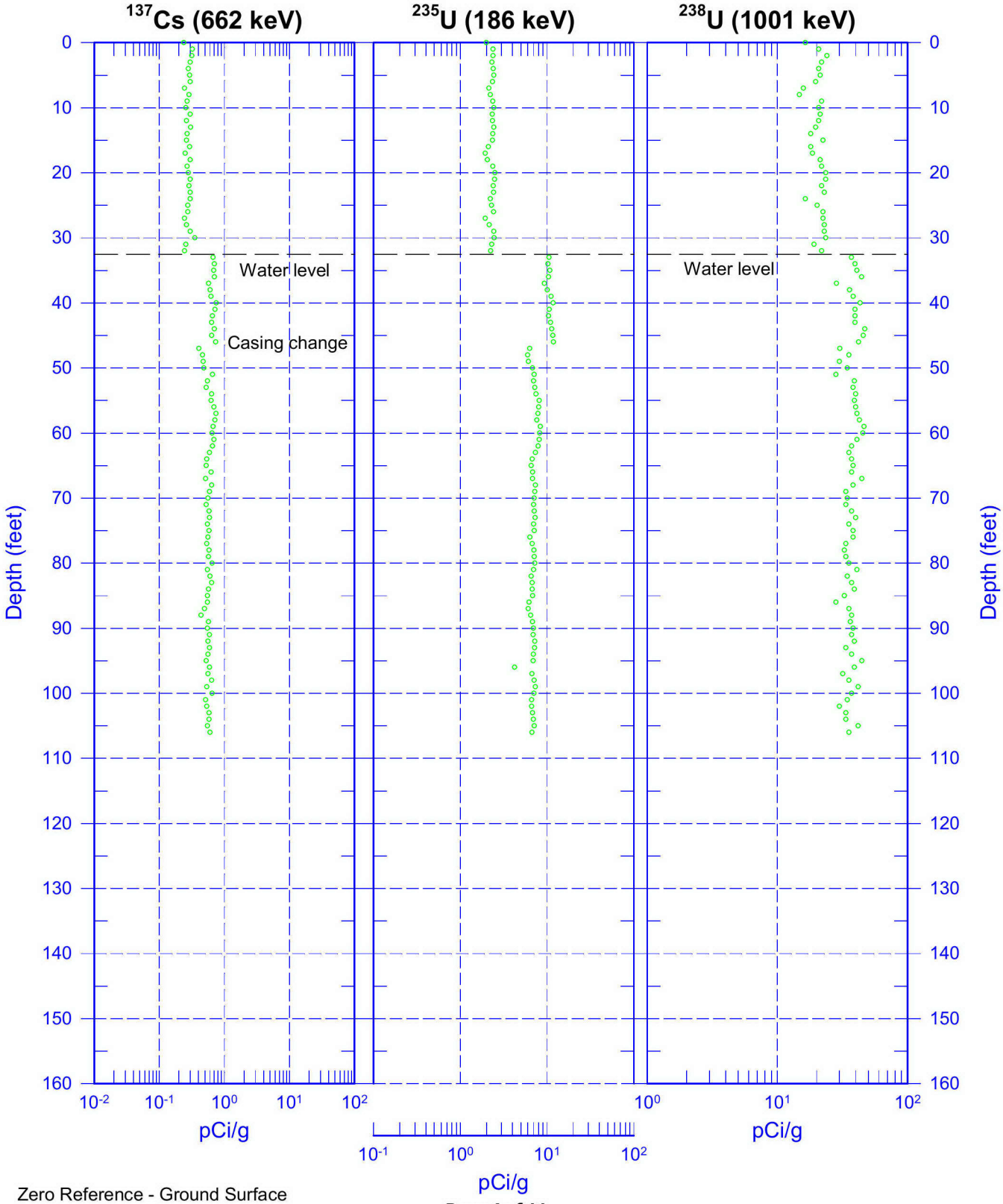
Manmade Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma & Dead Time
Total Gamma & Moisture
Total Gamma & Hanford Gamma Unit
Repeat Section of Natural Gamma Logs
Moisture Repeat Section

[1] GWL – groundwater level

HGLP-LDR-523, Rev. 0

Stoller Hanford Office

399-2-32 (C7660)
Manmade Radionuclides

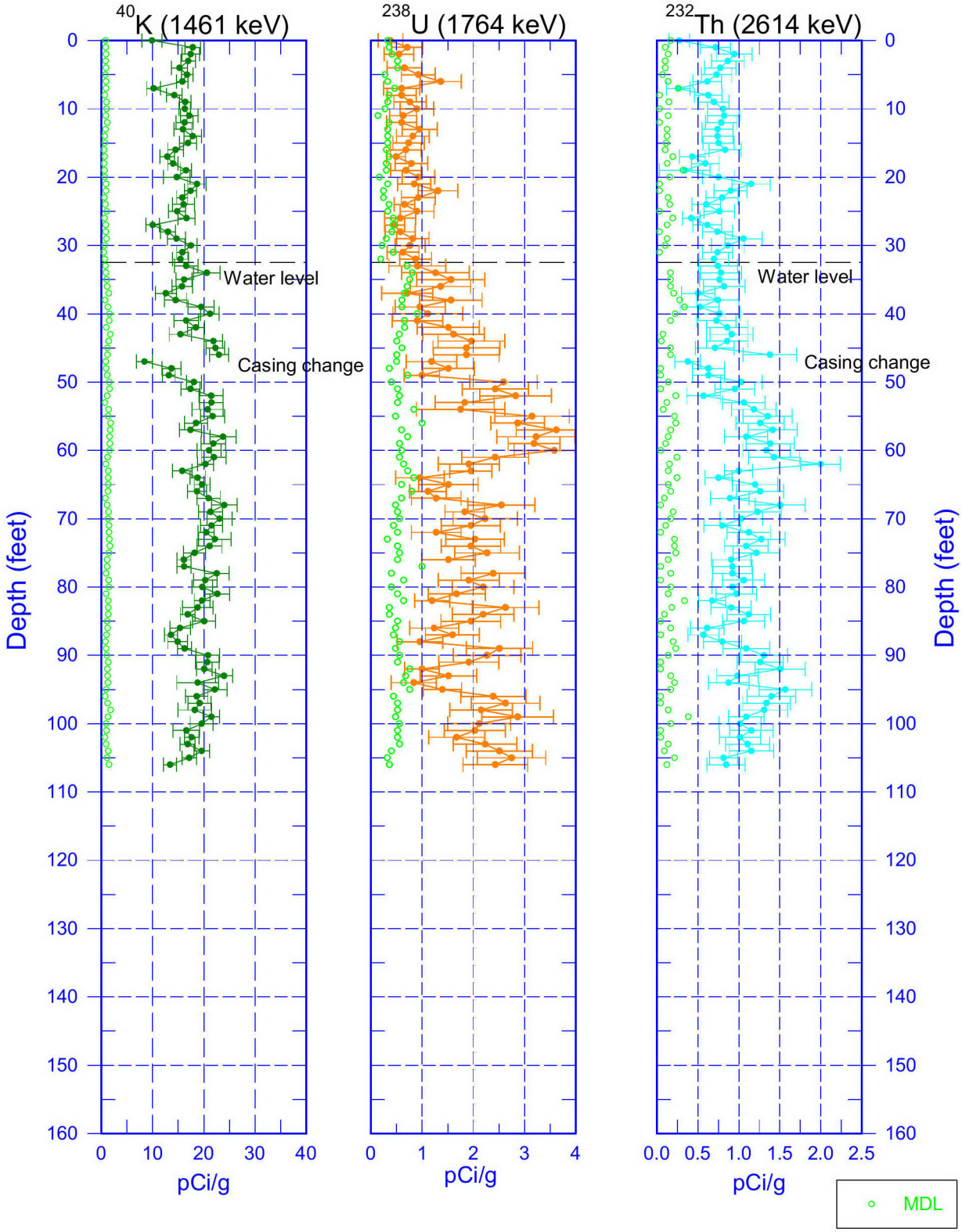


Zero Reference - Ground Surface

Stoller Hanford Office

HGLP-LDR-523, Rev. 0

399-2-32 (C7660)
Natural Gamma Logs

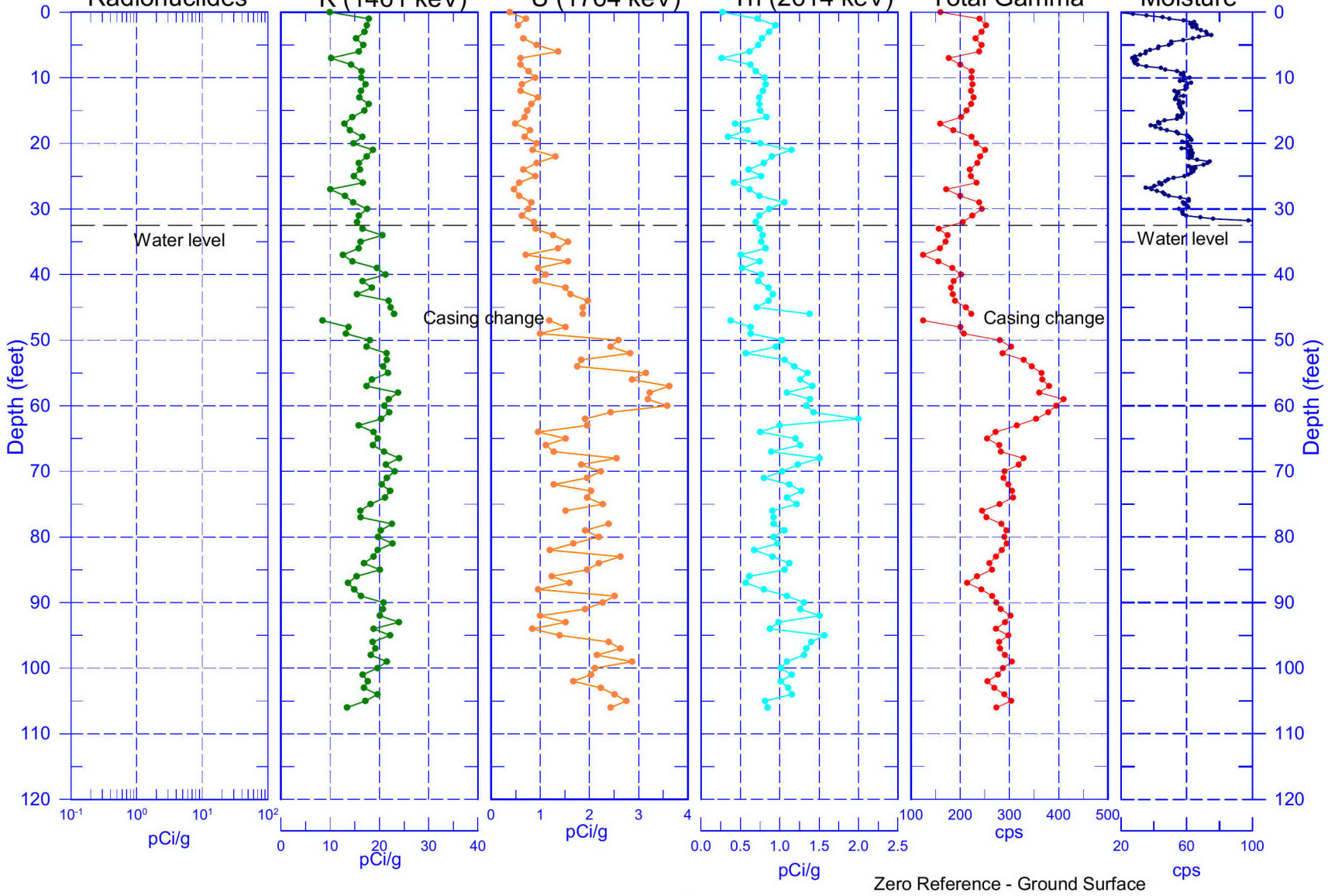


Zero Reference - Ground Surface

Stoller
Hanford Office

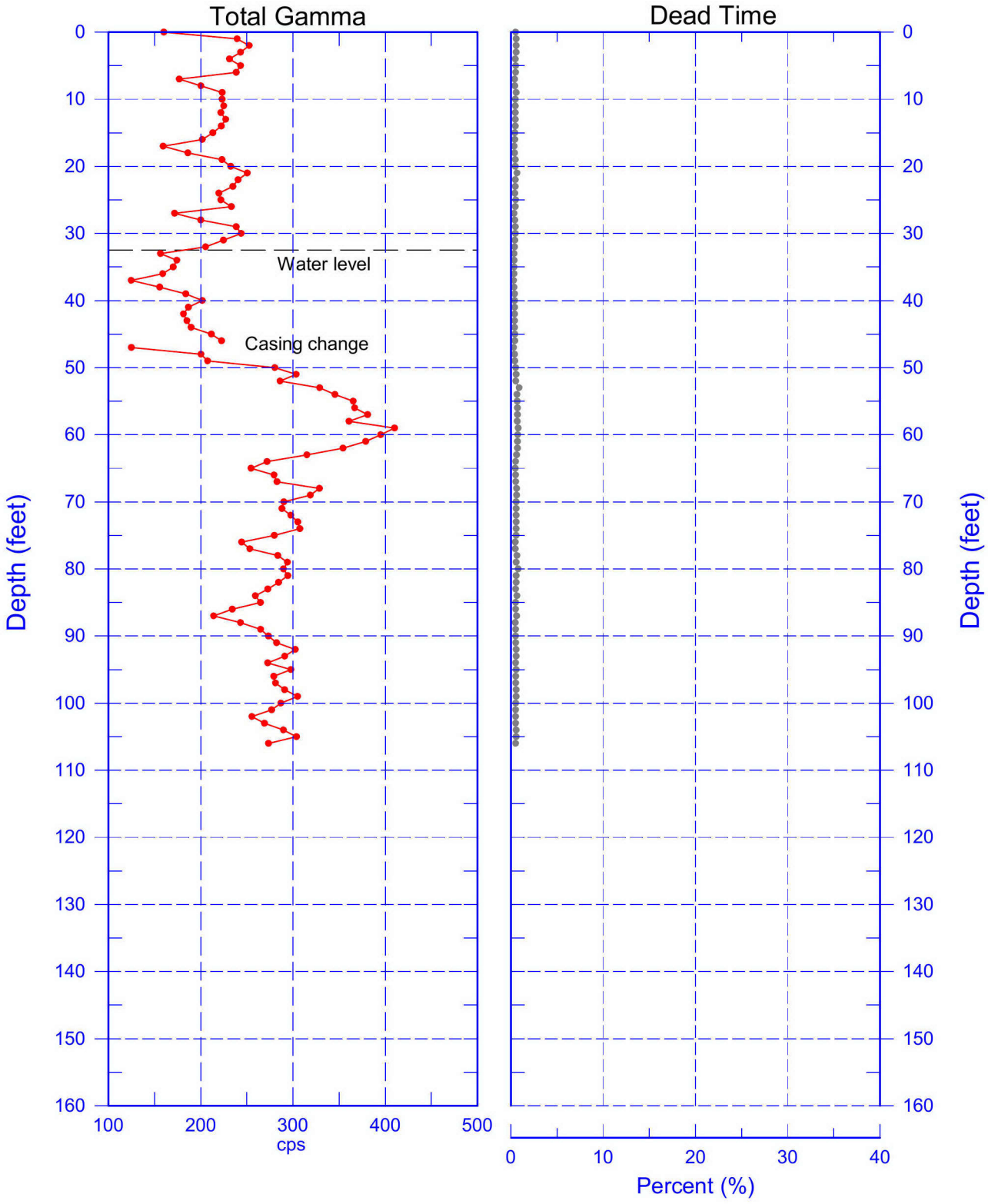
HGLP-LDR-523, Rev. 0

399-2-32 (C7660) Combination Plot



Stoller Hanford Office

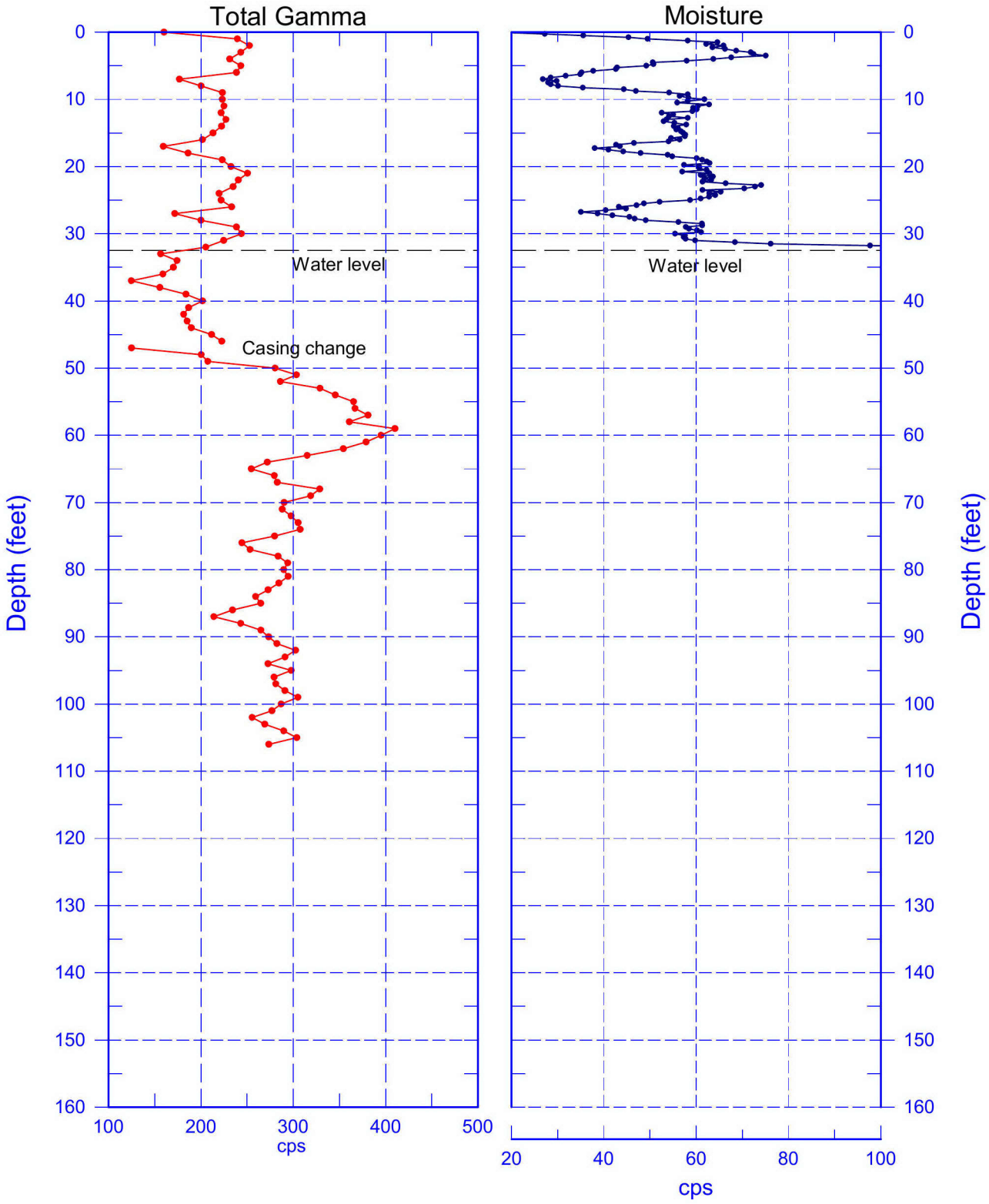
399-2-32 (C7660)
Total Gamma & Dead Time



Reference - Ground Surface

Stoller Hanford Office

399-2-32 (C7660)
Total Gamma & Moisture



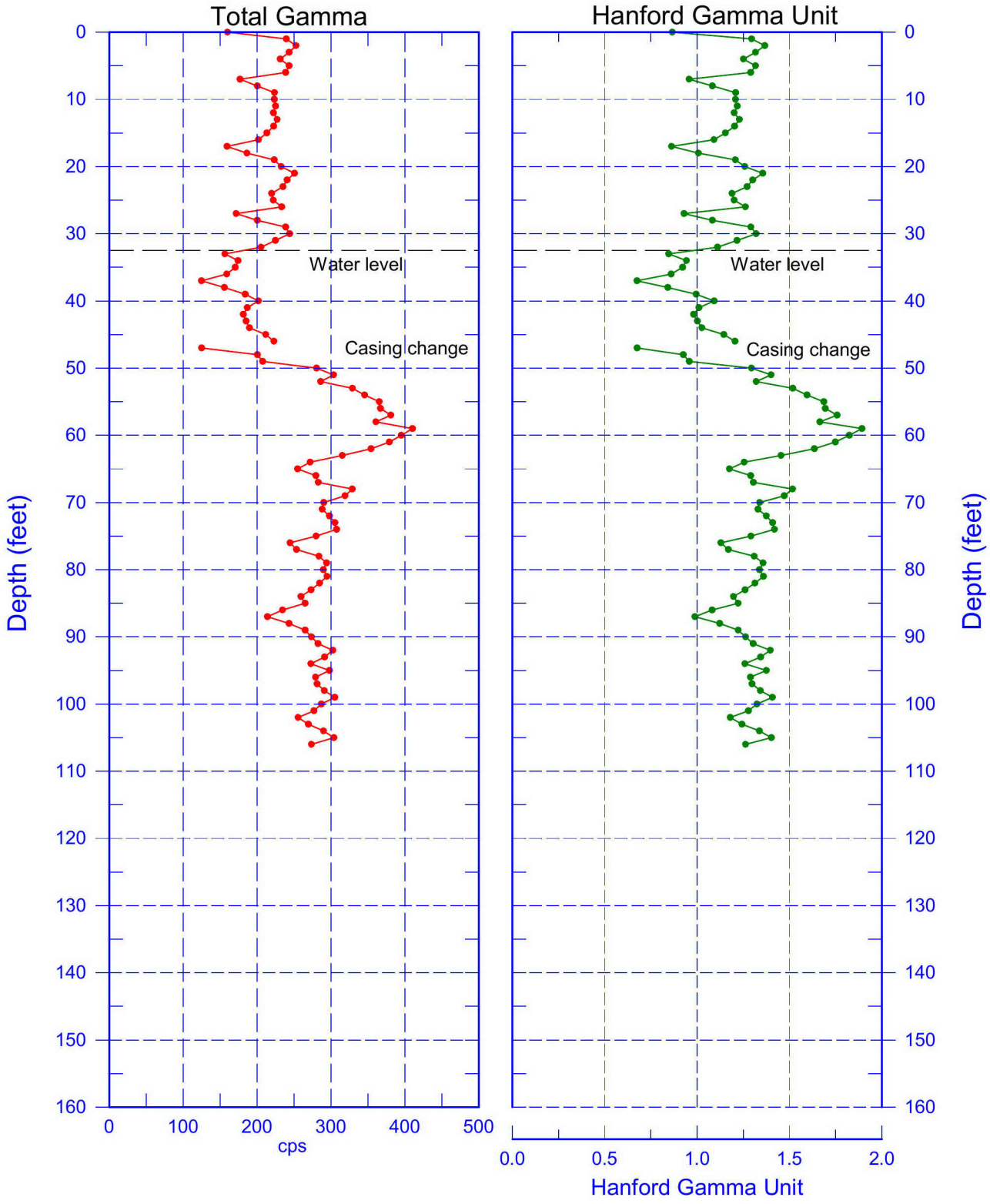
Reference - Ground Surface

HGLP-LDR-523, Rev. 0

Stoller Hanford Office

399-2-32 (C7660)

Total Gamma & Hanford Gamma Unit

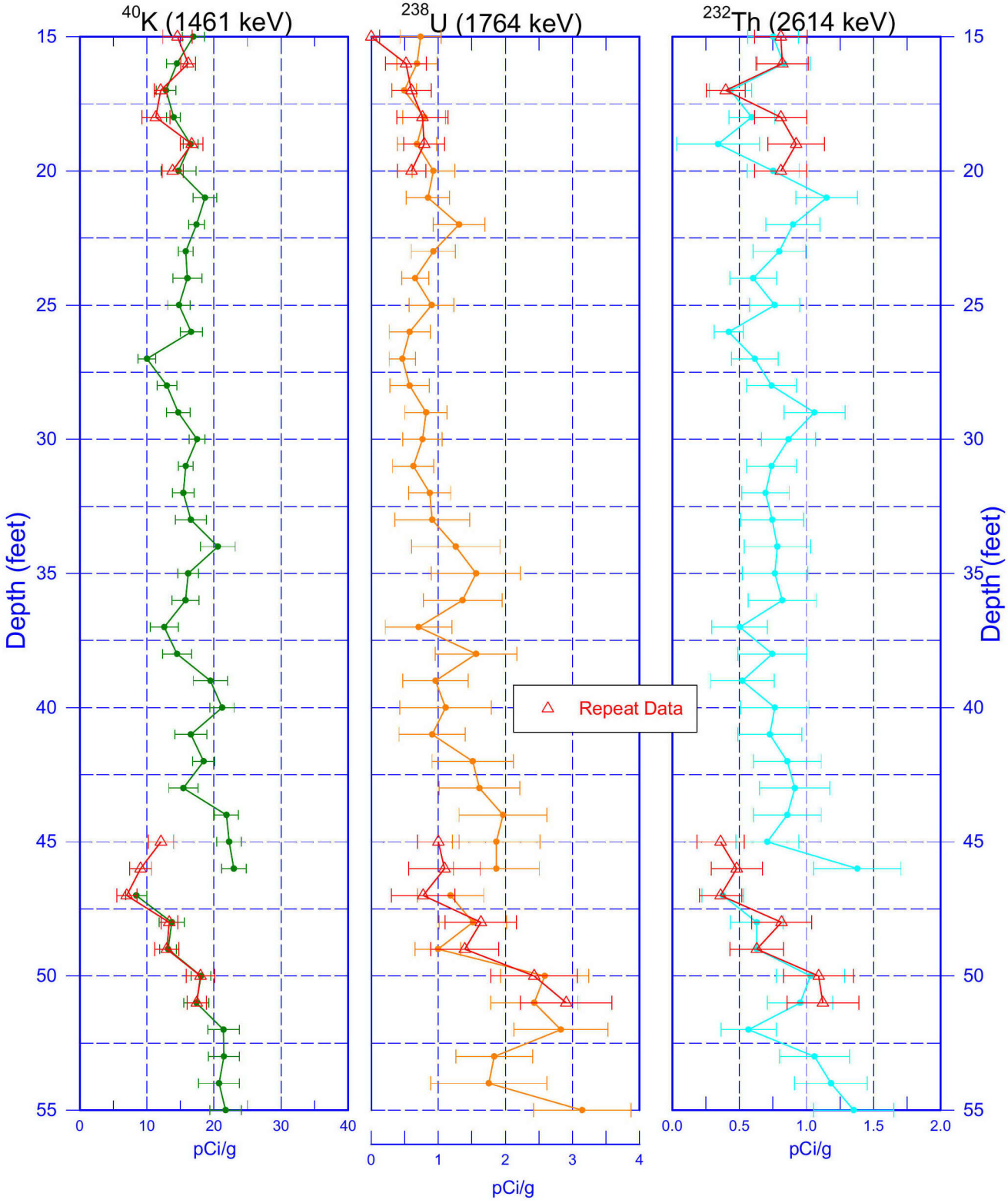


Reference - Ground Surface

Stoller Hanford Office

399-2-32 (C7660)

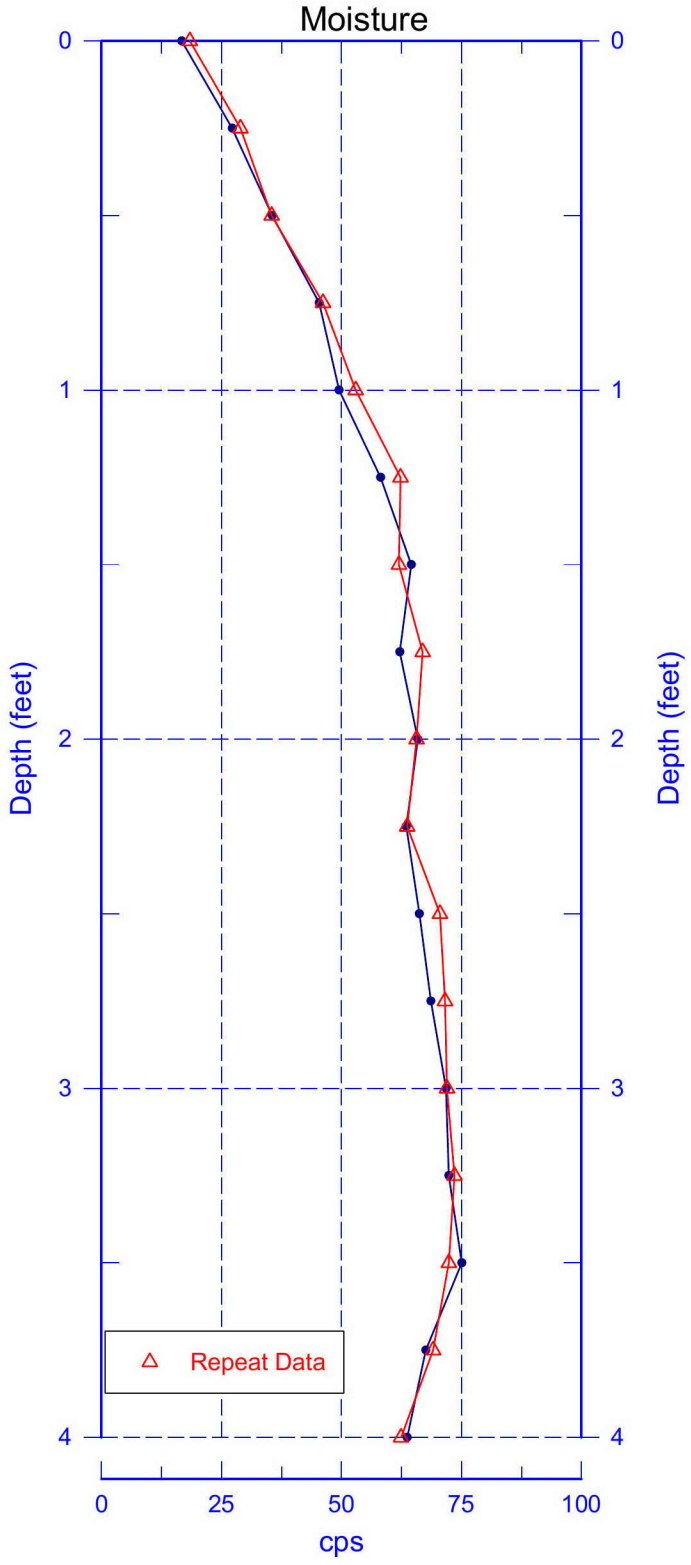
Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Stoller
Hanford Office

399-2-32 (C7660)
Moisture Repeat Section



Reference - Ground Surface

Stoller Hanford Office established 1959

HGLP-LDR-562, Rev. 0

399-4-15 (C7662)
Log Data Report

Borehole Information:

Borehole:	399-4-15 (C7662)		Site:	300-DU-5_300-FF-5	
Coordinates (WA St Plane)		GWL[1] (ft):	46.0	GWL Date:	1/31/11
North (m)	East (m)	Drill Date	TOC[2] Elevation	Total Depth (ft)	Type
N/A	N/A	2/4/11	N/A	146	Sonic

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded Steel	0.6	12	10 7/8	9/16	0.6	49.5
Threaded Steel	3.7	10 5/8	9 5/8	1/2	3.7	136.3

Borehole Notes:

The driller provided total depth, casing depths, and depth to water. The logging engineer measured casing diameters (rounded to the nearest 1/16-in.).

Zero reference is ground surface.

Logging Equipment Information:

Logging System:	Gamma 1 N		Type: Serial No.:	(60%) HPGe SGLS 45-TP22010A
Effective Calibration Date:	12/21/10	Calibration Reference:	HGLP-CC-066	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Logging System:	Gamma 1 H		Type: Serial No.:	NMLS H310700352
Effective Calibration Date:	5/17/10	Calibration Reference:	HGLP-CC-058	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat	5	6 Repeat	
HEIS Number	1017601	1017602	1017603	1017604	
Date	1/31/11	1/31/11	2/5/11	2/5/11	
Logging Engineer	Spatz/ McClellan	Spatz/ McClellan	Spatz/Pearson	Spatz/Pearson	
Start Depth (ft)	0.0	39.0	136.0	57.0	
Finish Depth (ft)	49.0	44.0	48.0	48.0	
Count Time (sec)	100	100	100	100	
Live/Real	R	R	R	R	
Shield (Y/N)	N	N	N	N	
MSA Interval (ft)	1.0	1.0	1.0	1.0	
Log Speed (ft/min)	N/A	N/A	N/A	N/A	
Pre-Verification	AN187CAB	AN187CAB	AN192CAB	AN192CAB	
Start File	AN187000	AN187050	AN192000	AN192089	
Finish File	AN187049	AN187055	AN192088	AN192098	
Post-Verification	AN187CAA	AN187CAA	AN192CAA	AN192CAA	

Log Run	1	2 Repeat	5	6 Repeat	
Depth Return Error (in.)	N/A	0.0	N/A	0.0	
Comments	No fine-gain adjustment made.	No fine-gain adjustment made.	No fine-gain adjustment made.	No fine-gain adjustment made.	

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	3	4 Repeat			
HEIS Number	1017605	1017606			
Date	1/31/11	1/31/11			
Logging Engineer	Spatz/ McClellan	Spatz/ McClellan			
Start Depth (ft)	0.0	39.0			
Finish Depth (ft)	45.5	44.0			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
Log Speed (ft/min)	N/A	N/A			
Pre-Verification	AH066CAB	AH066CAB			
Start File	AH066000	AH066183			
Finish File	AH066182	AH066203			
Post-Verification	AH066CAA	AH066CAA			
Depth Return Error (in.)	N/A	0.0			
Comments	None	None			

Logging Operation Notes:

SGLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the Amersham KUTh-118 field verifier. A centralizer was installed on the sonde.

NMLS data were collected using Gamma 1 HO 68B-3574. Pre and post-survey verification measurements were acquired in the AmBe standard field verifier. A centralizer was installed on the sonde.

Analysis Notes:

Analyst:	C. Nelson	Date:	2/25/11	Reference:	HGLP-MAN-003, Rev. 0

Pre- and post-survey verification measurements met the acceptance criteria for the established systems.

Corrections for 9/16-in. thick casing from 0-49 ft and for 1/2-in. thick casing from 50-136 ft were applied during analysis. A water correction was applied from 46 feet to the total logged depth of the borehole.

SGLS spectra were processed in batch mode in APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated in an EXCEL template identified as AN20101221, using an efficiency function and corrections for casing and dead time as determined by annual calibrations.

During routine processing of gamma spectra, regions of interest are forced at specific energy levels associated with natural and manmade radionuclides that can be anticipated to be present. This processing approach sometimes results in an isolated “detection” near the minimum detection level (MDL) resulting in a false positive. Where these detections occur, the individual spectrum is scrutinized and a determination is made regarding the validity of the detection. If the detection is deemed not representative of a full energy peak, or if confirming peaks are not detected, it is removed from the data set. The integrity of the raw data files and the processed files are maintained should questions arise in the future regarding these determinations.

The NMLS data are presented in counts per second (cps) because no calibration data exist for a 10 7/8-in. inner diameter casing.

The Hanford Gamma Unit (HGU) is an empirical unit of gamma activity proposed as a means to standardize gamma log response across multiple logging systems with different response characteristics. The HGU is defined in terms of measurements in the Hanford Borehole Calibration Facility, and the magnitude is selected such that 1 HGU is approximately equivalent to typical Hanford background activity, based on data from background samples as reported in *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12).

Results and Interpretations:

No manmade radionuclides were detected in this borehole. Although not detected, MDLs for Cs-137, U-235 and U-238 are plotted on the manmade radionuclides plots.

The neutron moisture log primarily responds to moisture present in the surrounding formation. In general, an increase in count rate reflects an increase in moisture content. Moisture content may increase in sediments of relatively high silt or clay content. Casing joints may be attenuating gamma and neutron activity from the detector at approximately 10-ft intervals.

The repeat plots indicate the respective systems were working properly.

List of Log Plots:

Depth Reference is ground surface

Manmade Radionuclides
Natural Gamma Logs
Combination Plot (2 pages)
Combination Plot (0-140 ft)
Total Gamma & Dead Time
Total Gamma & Moisture
Total Gamma & Hanford Gamma Unit
Repeat Section of Natural Gamma Logs
Moisture Repeat Section

[1] GWL – groundwater level
[2] TOC – top of casing

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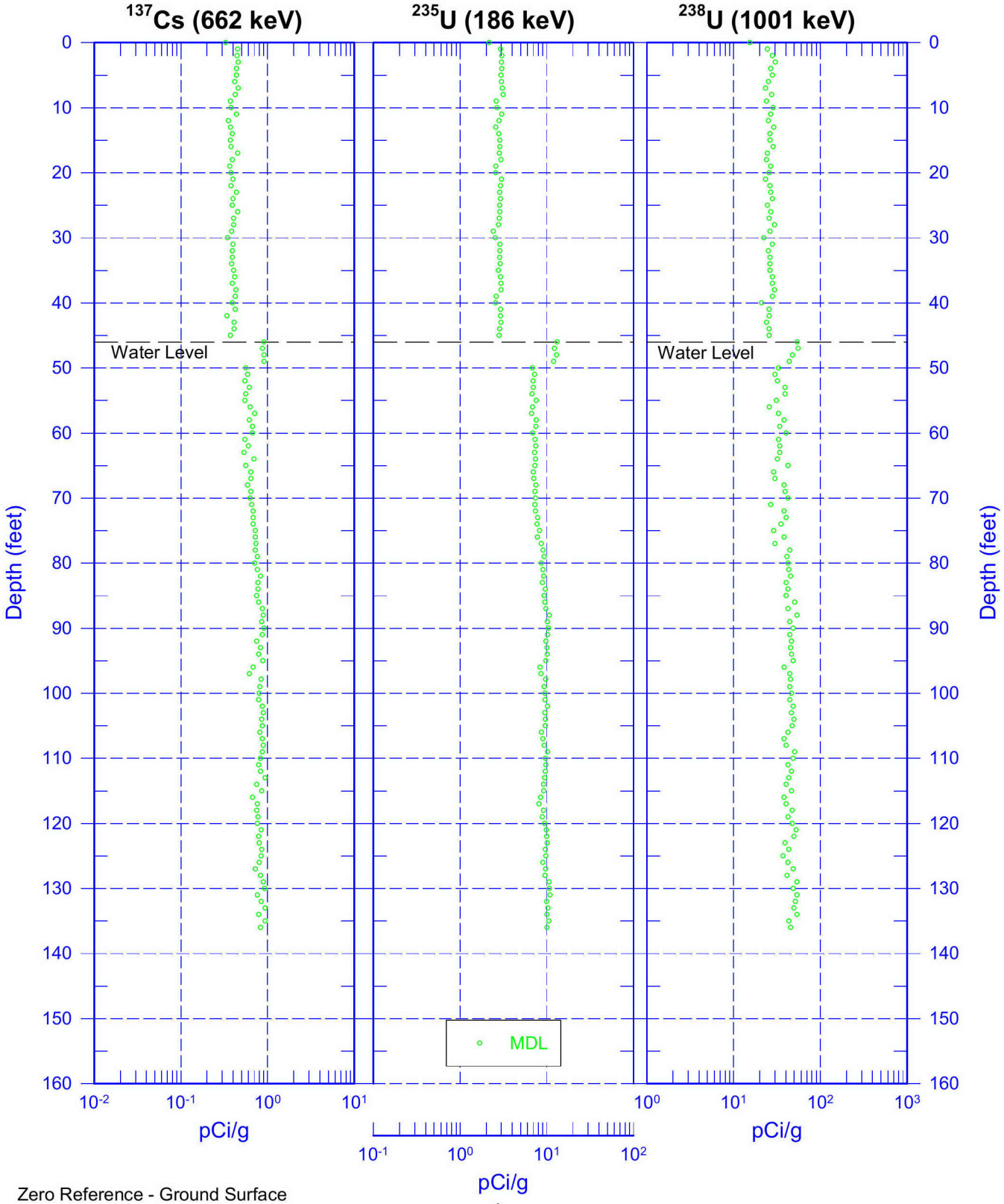
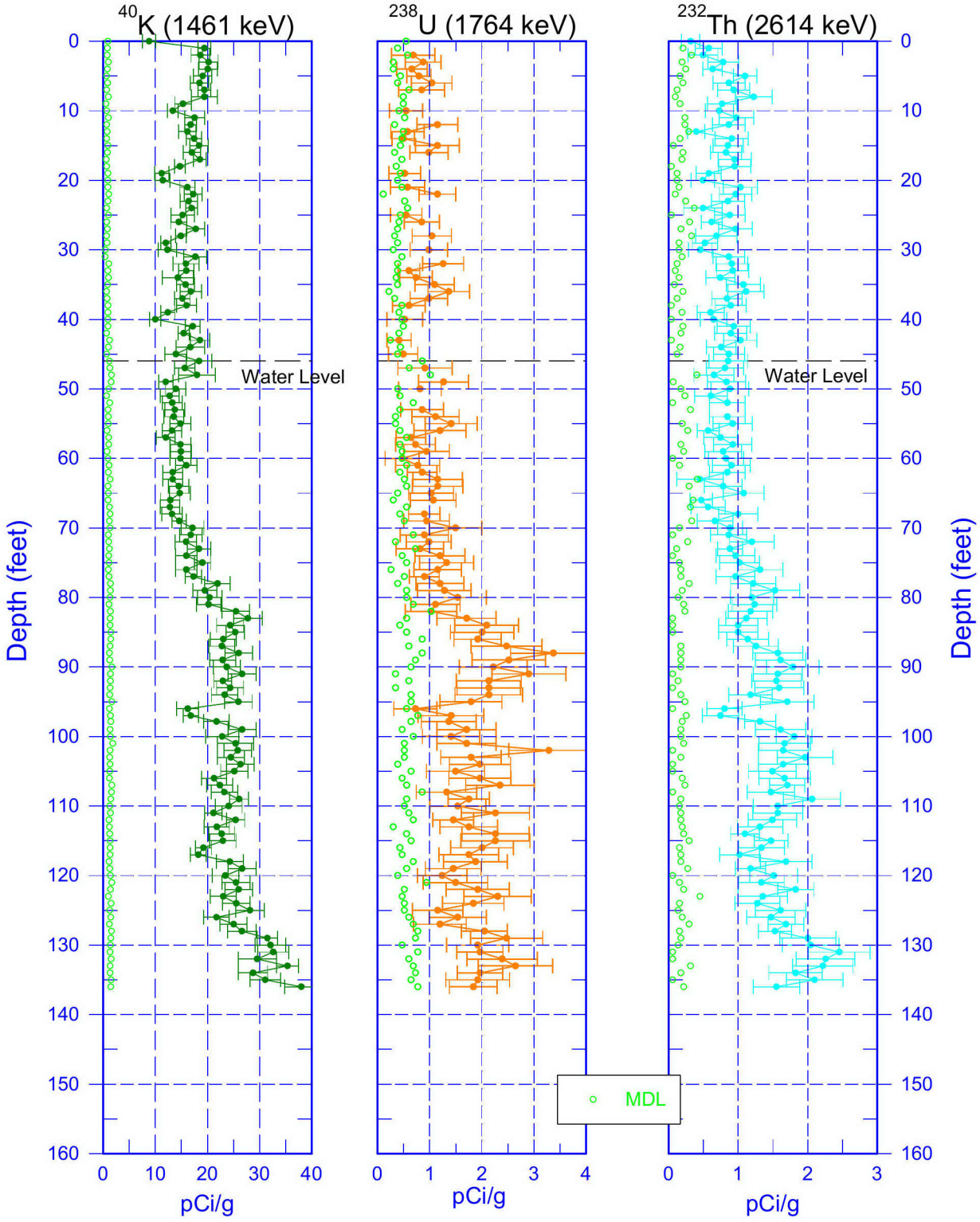
399-4-15 (C7662)
Manmade Radionuclides



Stoller
Hanford Office

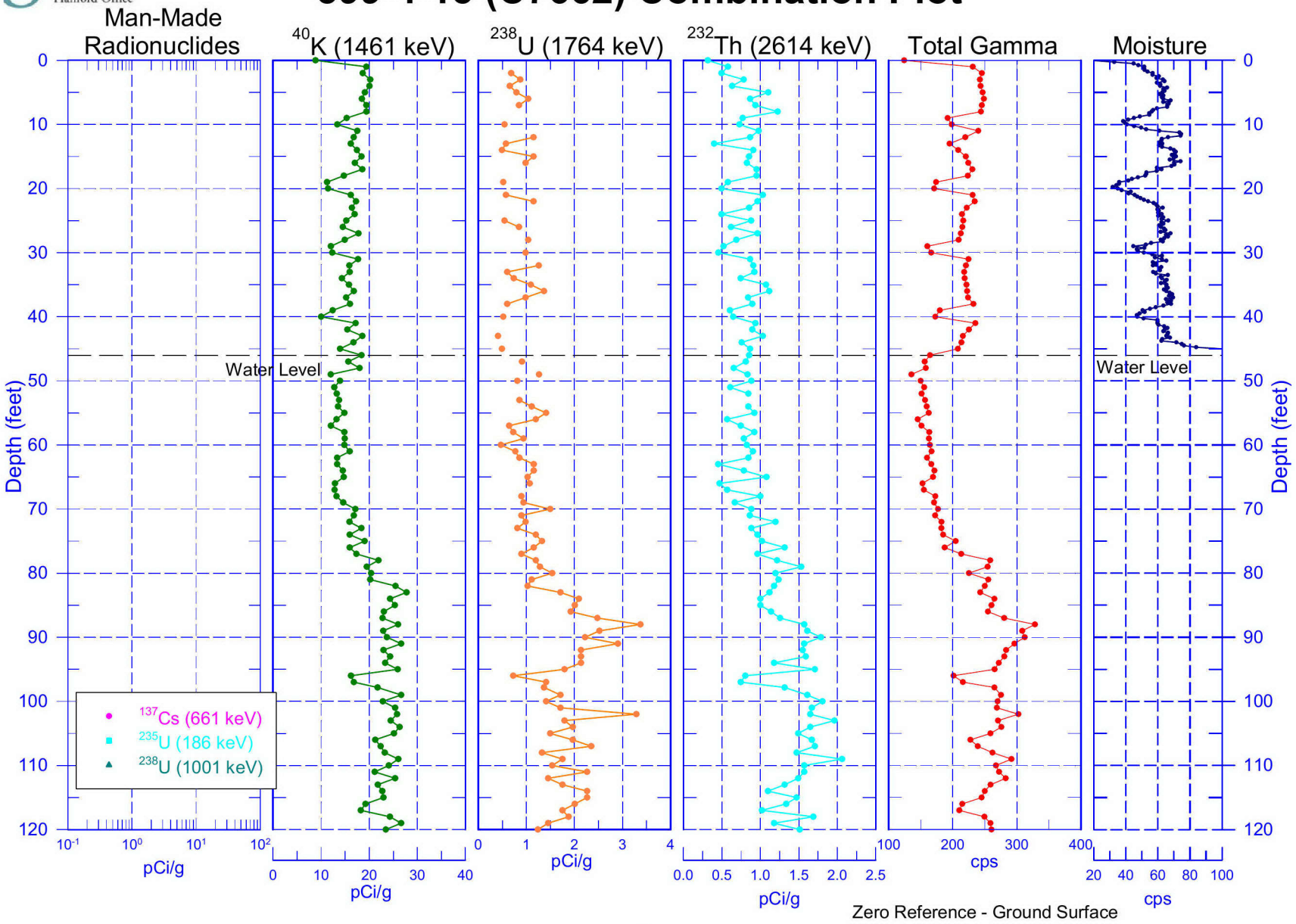
399-4-15 (C7662)
Natural Gamma Logs



Zero Reference - Ground Surface

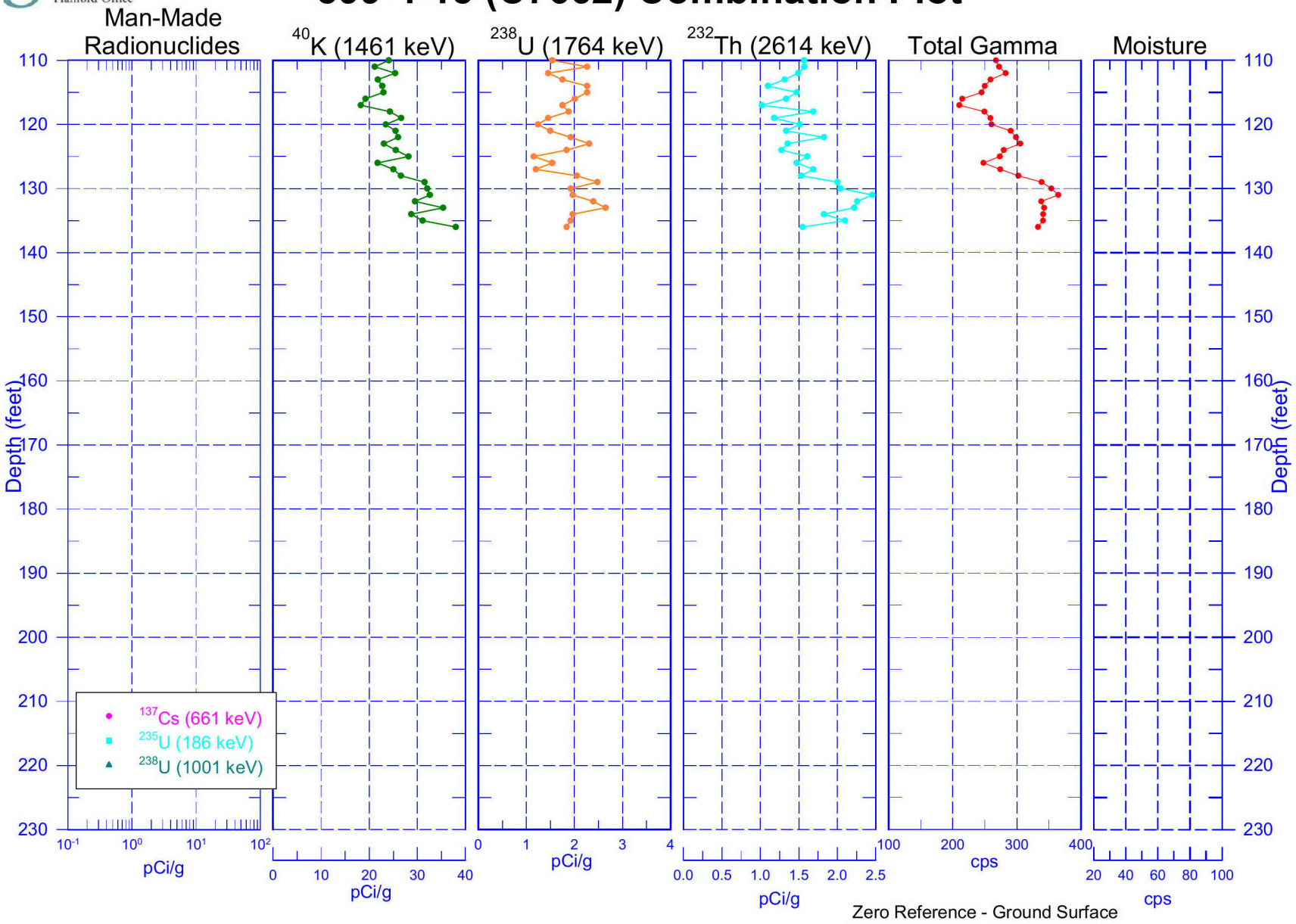
Stoller
Hanford Office

399-4-15 (C7662) Combination Plot



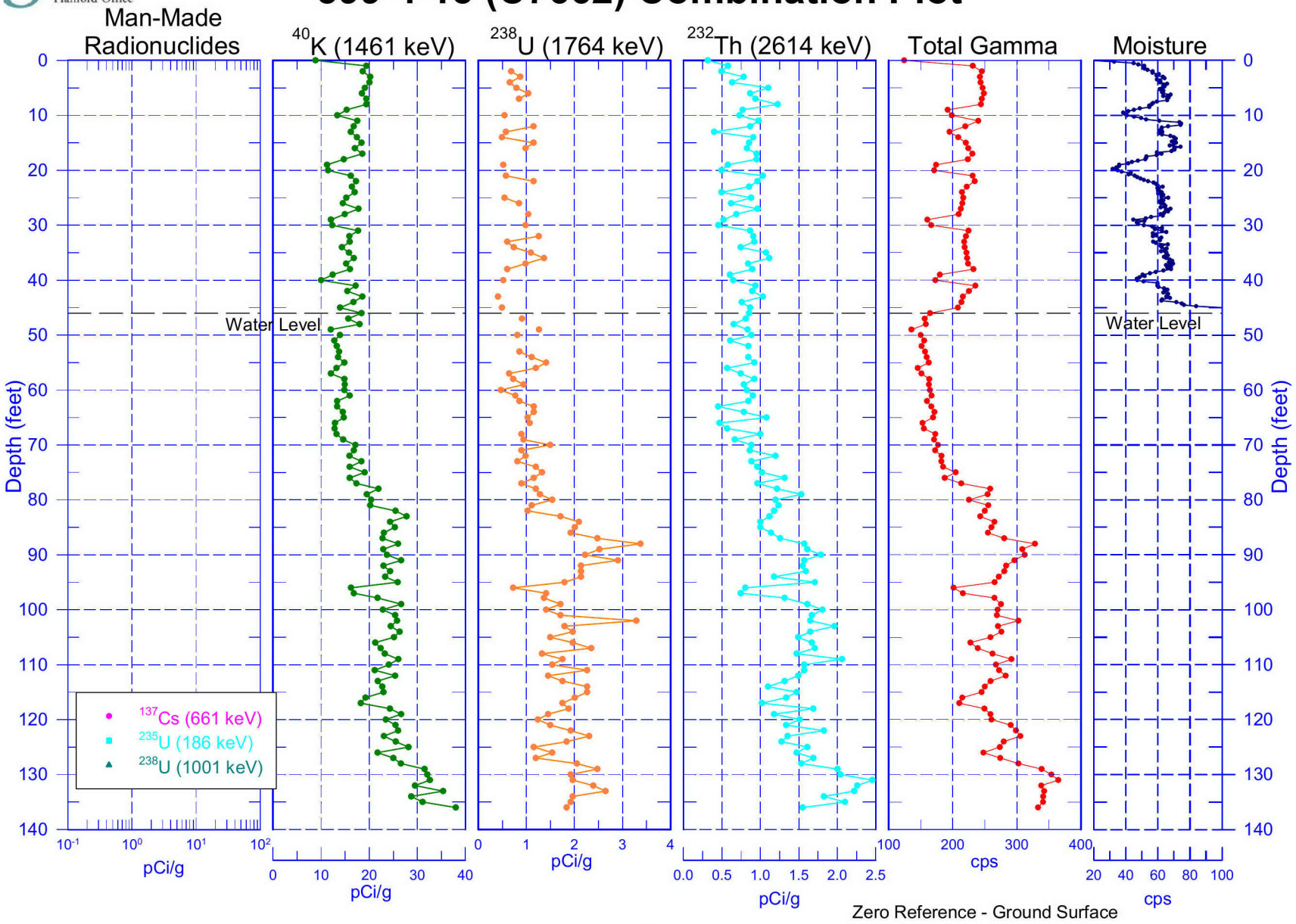
Stoller
Hanford Office

399-4-15 (C7662) Combination Plot



Stoller
Hanford Office

399-4-15 (C7662) Combination Plot



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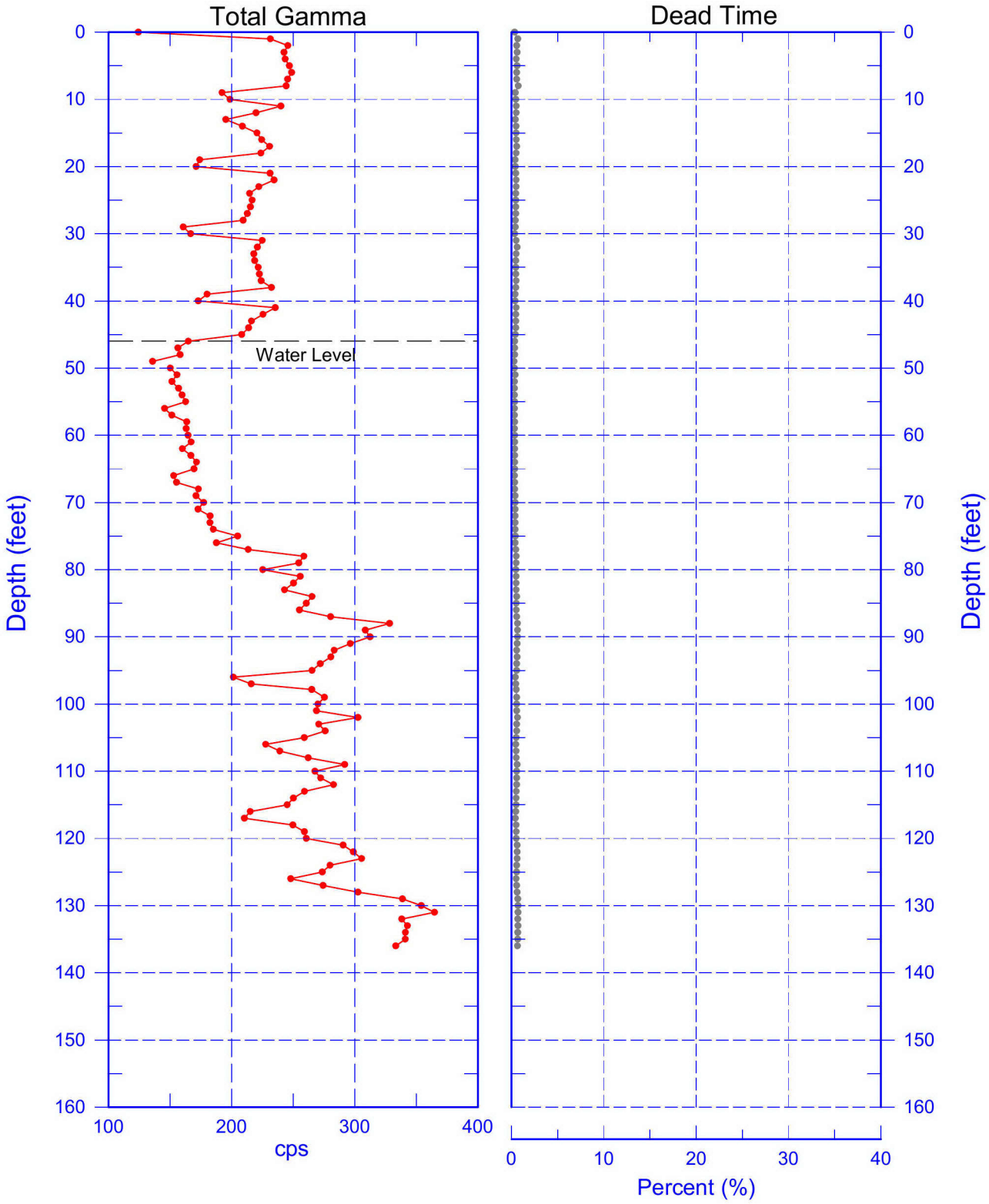
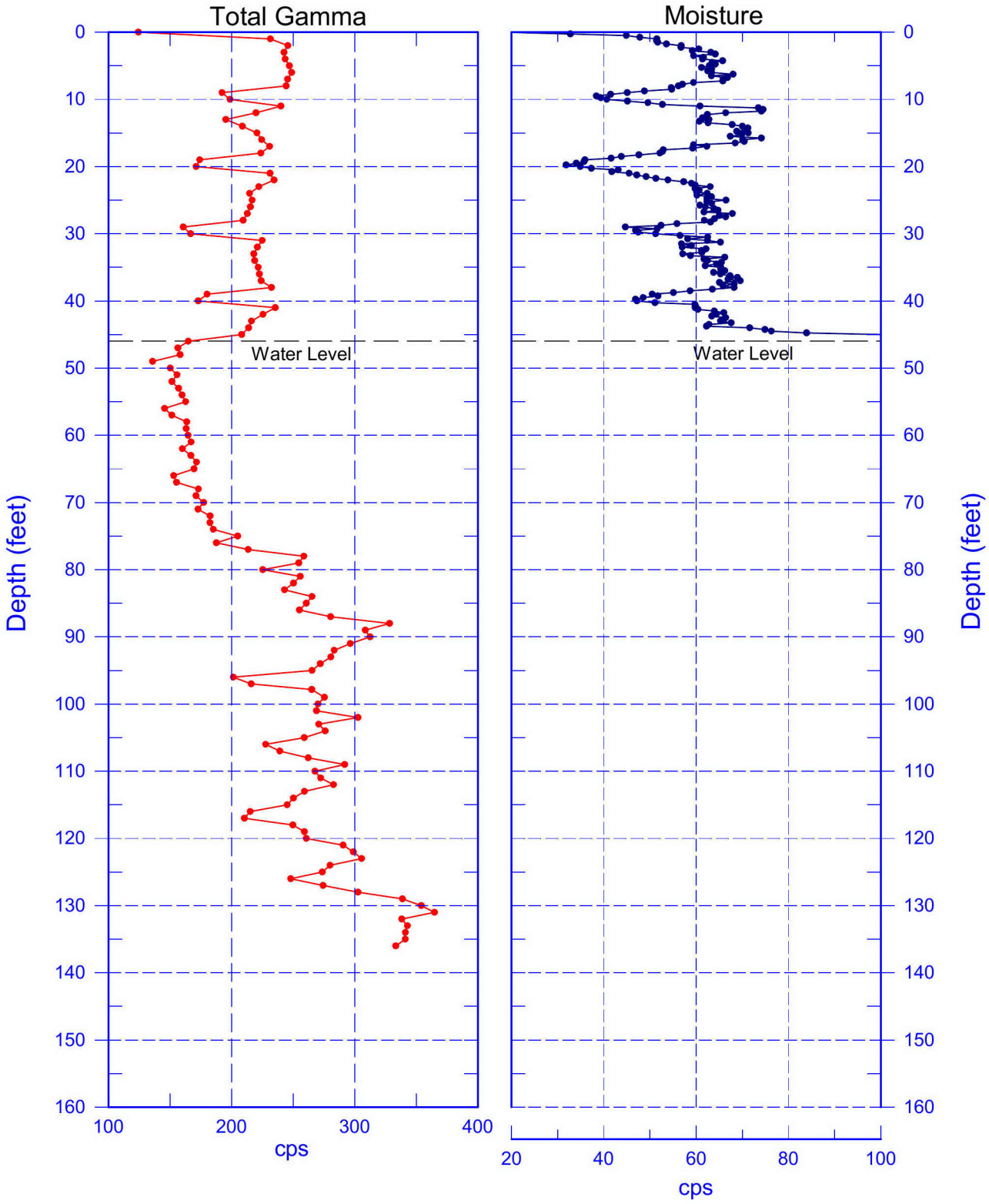
399-4-15 (C7662)
Total Gamma & Dead Time



Reference - Ground Surface

Stoller
Hanford Office

399-4-15 (C7662)
Total Gamma & Moisture

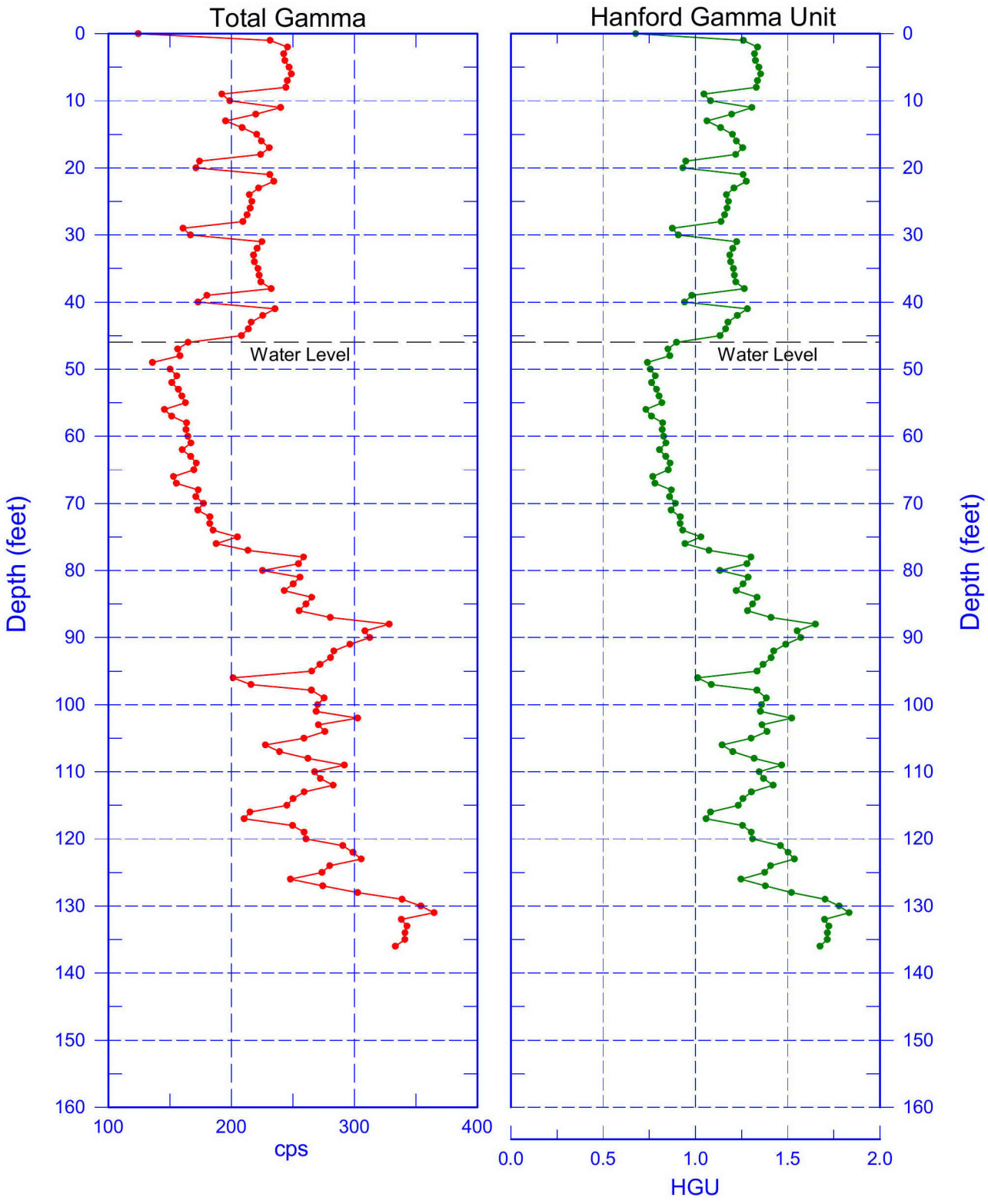


Reference - Ground Surface

Stoller Hanford Office

399-4-15 (C7662)

Total Gamma & Hanford Gamma Unit

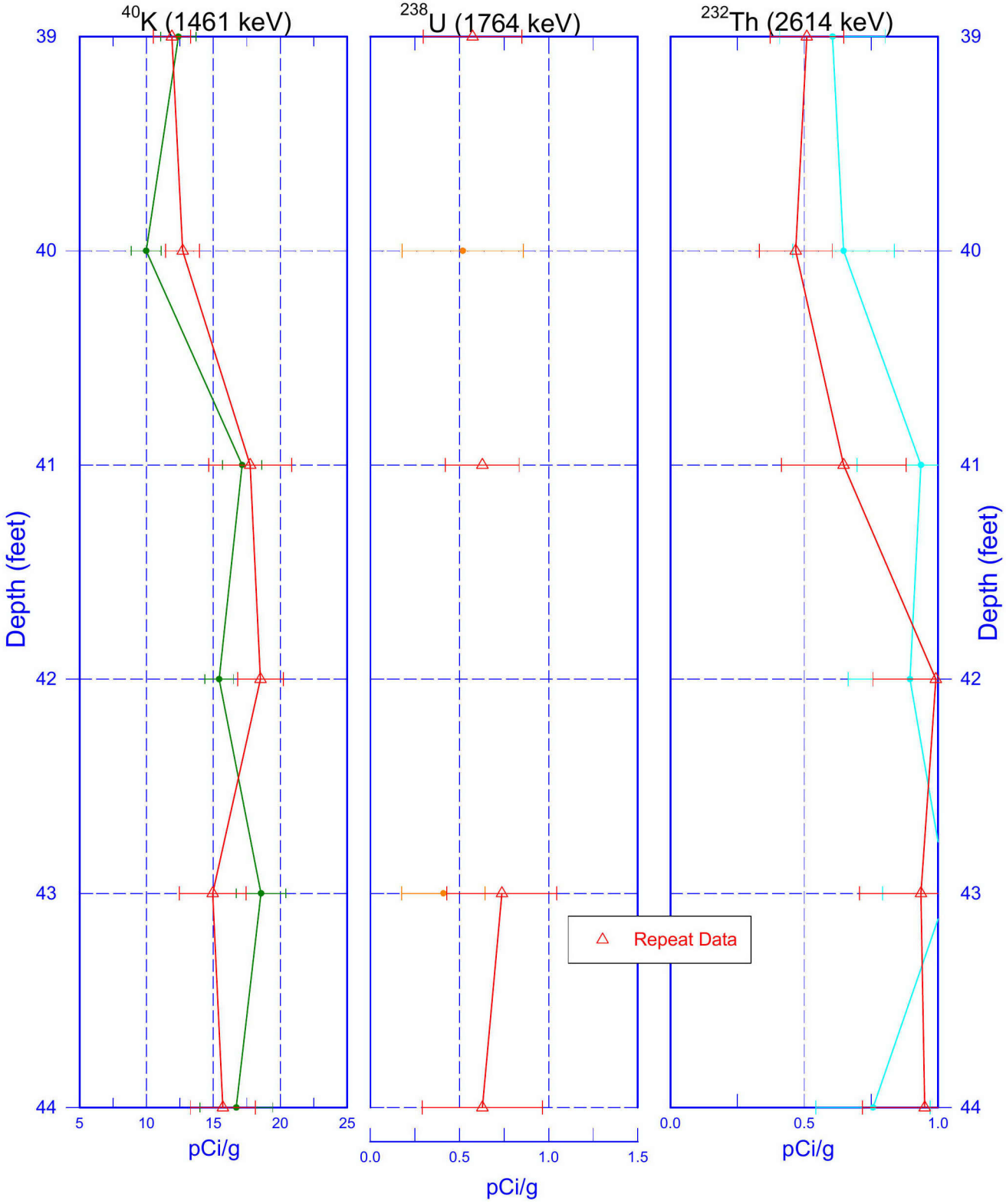


Reference - Ground Surface

Stoller
Hanford Office

399-4-15 (C7662)

Repeat Section of Natural Gamma Logs

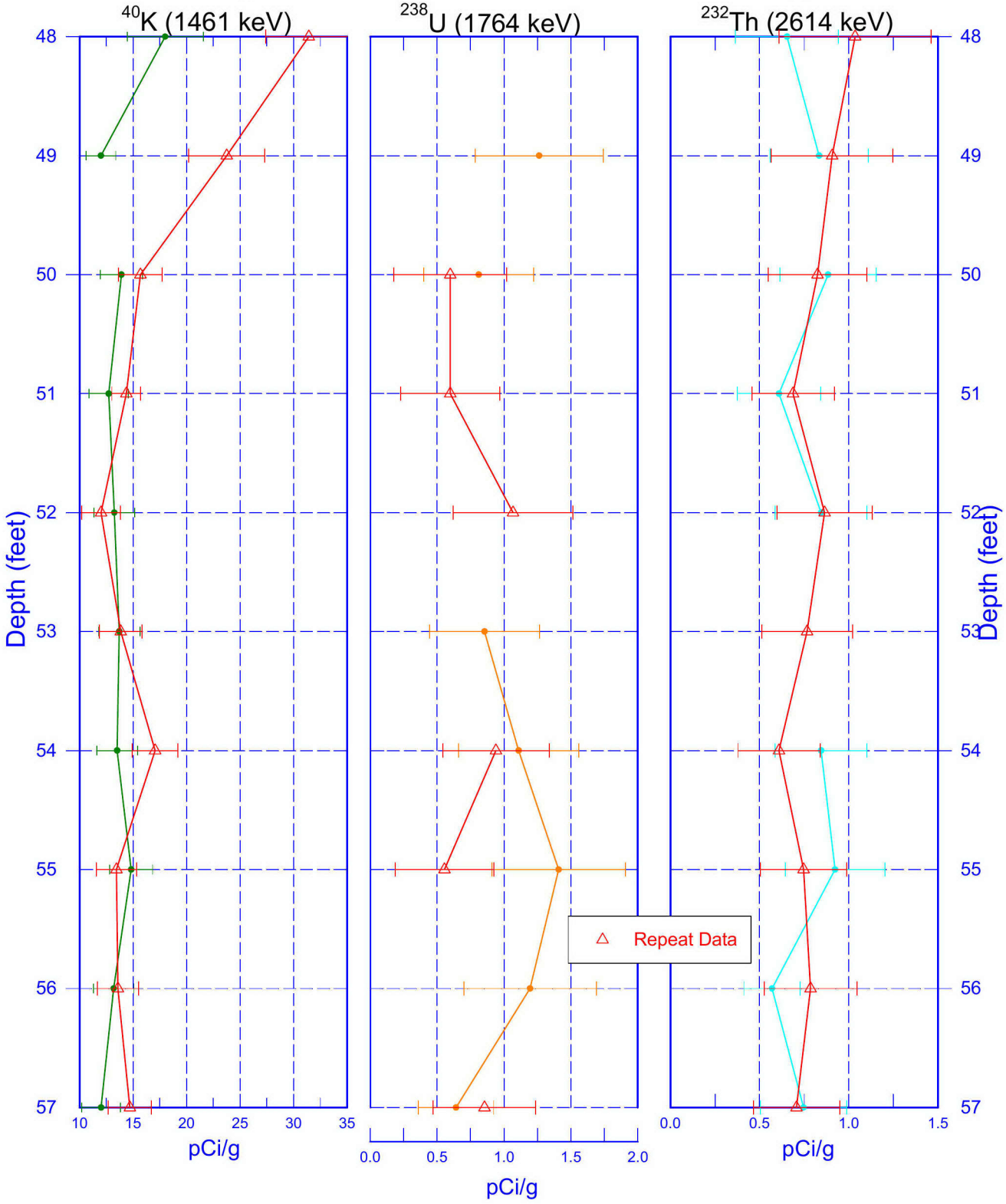


Zero Reference - Ground Surface

Stoller Hanford Office

399-4-15 (C7662)

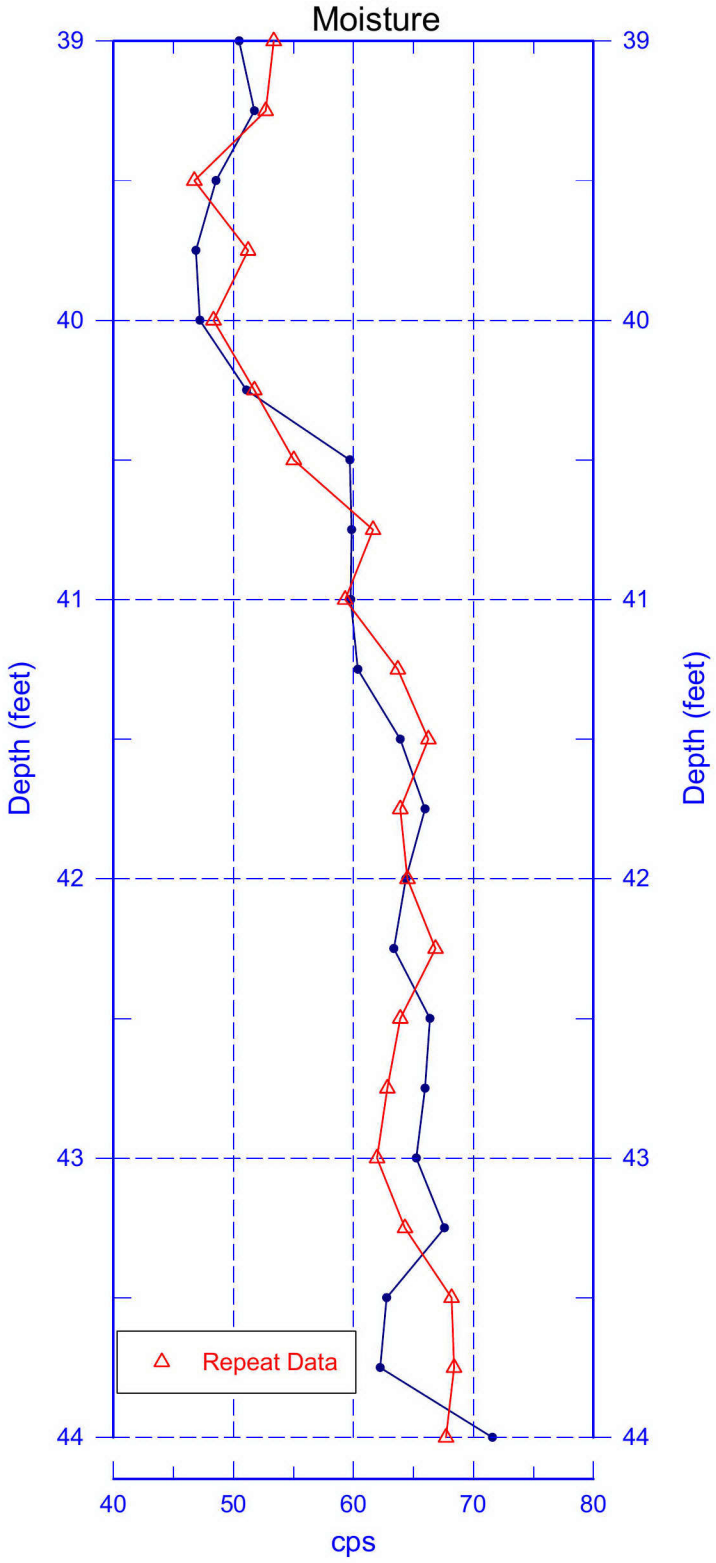
Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Stoller
Hanford Office

399-4-15 (C7662)
Moisture Repeat Section



Reference - Ground Surface

Stoller Hanford Office established 1959

HGLP-LDR-528, Rev. 0

399-3-33 (C7663)
Log Data Report

Borehole Information:

Borehole:	399-3-33 (C7663)		Site:	300-FF-5	
Coordinates (WA St Plane)		GWL[1] (ft):	43.5	GWL Date:	12/2/10
North (m)	East (m)	Drill Date	TOC Elevation	Total Depth (ft)	Type
Unknown	Unknown	12/7/10	Unknown	123	Cabel

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded steel	3	12	10 7/8	9/16	3	47
Threaded steel	3.4	10 1/2	9 5/8	7/16	3.4	126.6

Borehole Notes:

The total depth and casing depths were reported by the Buyer's Technical Representative (BTR). The logging engineer measured casing diameters rounding to the nearest 1/16-in.

Zero reference is ground surface.

Spectral Gamma Logging System (SGLS) Equipment Information:

Logging System:	Gamma 4L		Type:	(60%) HPGe SGLS SN: 47TP32211A
Effective Calibration Date:	1/20/10	Calibration Reference:	HGLP-CC-054	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Neutron Moisture Logging System (NMLS) Equipment Information:

Logging System:	Gamma 4M		Type:	NMLS SN: H340207279
Effective Calibration Date:	1/18/10	Calibration Reference:	HGLP-CC-052	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat	5	6 Repeat	
HEIS number	1017306	1017307	1017308	1017309	
Date	12/2/10	12/2/10	12/7/10	12/7/10	
Logging Engineer	McClellan	McClellan	McClellan	McClellan	
Start Depth (ft)	0.0	25.0	46.0	46.0	
Finish Depth (ft)	47.0	30.0	123.0	54.0	
Count Time (sec)	100	100	100	100	
Live/Real	R	R	R	R	
Shield (Y/N)	N	N	N	N	
MSA Interval (ft)	1.0	1.0	1.0	1.0	
Log Speed (ft/min)	N/A	N/A	N/A	N/A	
Pre-Verification	DLH21CAB	DLH21CAB	DLH71CAB	DLH71CAB	
Start File	DLH21000	DLH21048	DLH71000	DLH71078	
Finish File	DLH21047	DLH21053	DLH71077	DLH71086	
Post-Verification	DLH21CAA	DLH21CAA	DLH71CAA	DLH71CAA	
Depth Return Error (in.)	N/A	0	N/A	½ high	
Comments	No fine-gain adjustment made	No fine-gain adjustment made	No fine-gain adjustment made	No fine-gain adjustment made	

Stoller Hanford Office established 1959

HGLP-LDR-528, Rev. 0

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	3	4 Repeat			
HEIS number	1017310	1017311			
Date	12/2/10	12/2/10			
Logging Engineer	McClellan	McClellan			
Start Depth (ft)	0.0	25.0			
Finish Depth (ft)	43.5	30.0			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
Log Speed ft/min	N/A	N/A			
Pre-Verification	DMS82CAB	DMS82CAB			
Start File	DMS82000	DMS82175			
Finish File	DMS82174	DMS82195			
Post-Verification	DMS82CAA	DMS82CAA			
Depth Return Error (in.)	N/A	0			
Comments	None	None			

Logging Operation Notes:

SGLS data were collected using Gamma 4 HO 68B-3573. Pre and post survey verification measurements were acquired in the Amersham KUTh-115 field verifier. A centralizer was installed on the sonde.

NMLS data were collected using Gamma 4 HO 68B-3573. Pre and post survey verification measurements were acquired in the AmBe standard field verifier. A centralizer was installed on the sonde.

Analysis Notes:

Analyst:	C. Nelson	Date:	12/15/10	Reference:	GJO-HGLP 1.6.3, Rev. 0

The pre- and post-survey verification measurements met the acceptance criteria for the established systems.

A casing correction for 9/16-in. casing was applied during analysis from ground surface to 47 ft, and a casing correction for 7/16-in. casing was applied during analysis from 48-123 ft.

A water correction was applied from 44 ft to the total logged depth of the borehole.

SGLS spectra were processed in batch mode in APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated in EXCEL template identified as DL20100120, using efficiency functions and corrections for casing and dead time as determined by the systems' annual calibration.

During routine processing of gamma spectra, regions of interest are forced at specific energy levels associated with natural and manmade radionuclides that are anticipated to be present. This processing approach sometimes results in an isolated "detection" near the Minimum Detection Level (MDL) resulting in a false positive. Where these detections occur, the individual spectrum is scrutinized and a determination is made regarding the validity of the detection. If the detection is deemed not representative of a full energy peak, or if confirming peaks are not detected, it is removed from the data set. The integrity of the raw data files and the processed files are maintained should questions arise in the future regarding these determinations.

NMLS data are represented in counts per second (cps) because no calibration data exists for 12-in. and 10-in. diameter boreholes.

The Hanford Gamma Unit (HGU) is an empirical unit of gamma activity proposed as a means to standardize gamma log response across multiple logging systems with different response characteristics. The HGU is defined in terms of measurements in the Hanford Borehole Calibration Facility, and the magnitude is selected such that 1 HGU is approximately equivalent to typical Hanford background activity, based on data from background samples as reported in *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12).

Results and Interpretations:

No manmade radionuclides were detected in this borehole. The MDL's for Cs-137, U-235 and U-238 are plotted on the Manmade Radionuclide plot.

Radon appears to exist in the groundwater, particularly between 65 ft and the bottom of the borehole.

The neutron moisture log primarily responds to moisture present in the surrounding formation. In general, an increase in count rate reflects an increase in moisture content. Moisture content may increase in sediments of relatively high silt or clay content. Casing joints may be attenuating gamma and neutron activity from the detector at approximately 10-ft intervals.

An increase in K-40 and Th-232 concentrations between 49-65 ft may indicate a change in lithology at this depth.

The KUT and moisture repeat plots indicate that the respective systems were working properly.

List of Plots:

Depth reference is ground surface

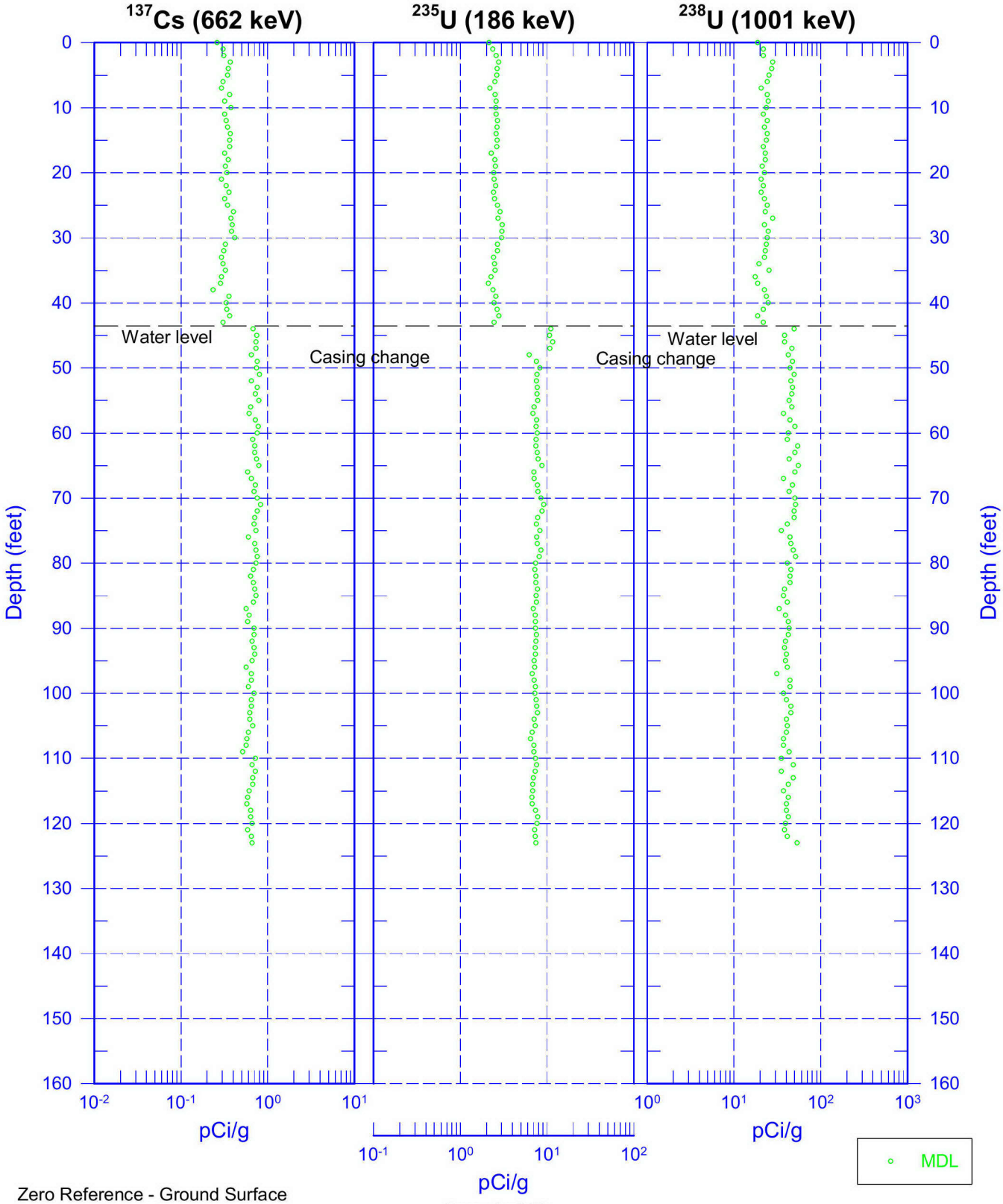
Manmade Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma & Dead Time
Total Gamma & Moisture
Total Gamma & Hanford Gamma Unit
Repeat Section of Natural Gamma Logs 25-30 ft
Repeat Section of Natural Gamma Logs 45-55 ft
Moisture Repeat Section

[1] GWL – groundwater level

HGLP-LDR-528, Rev. 0

Stoller Hanford Office

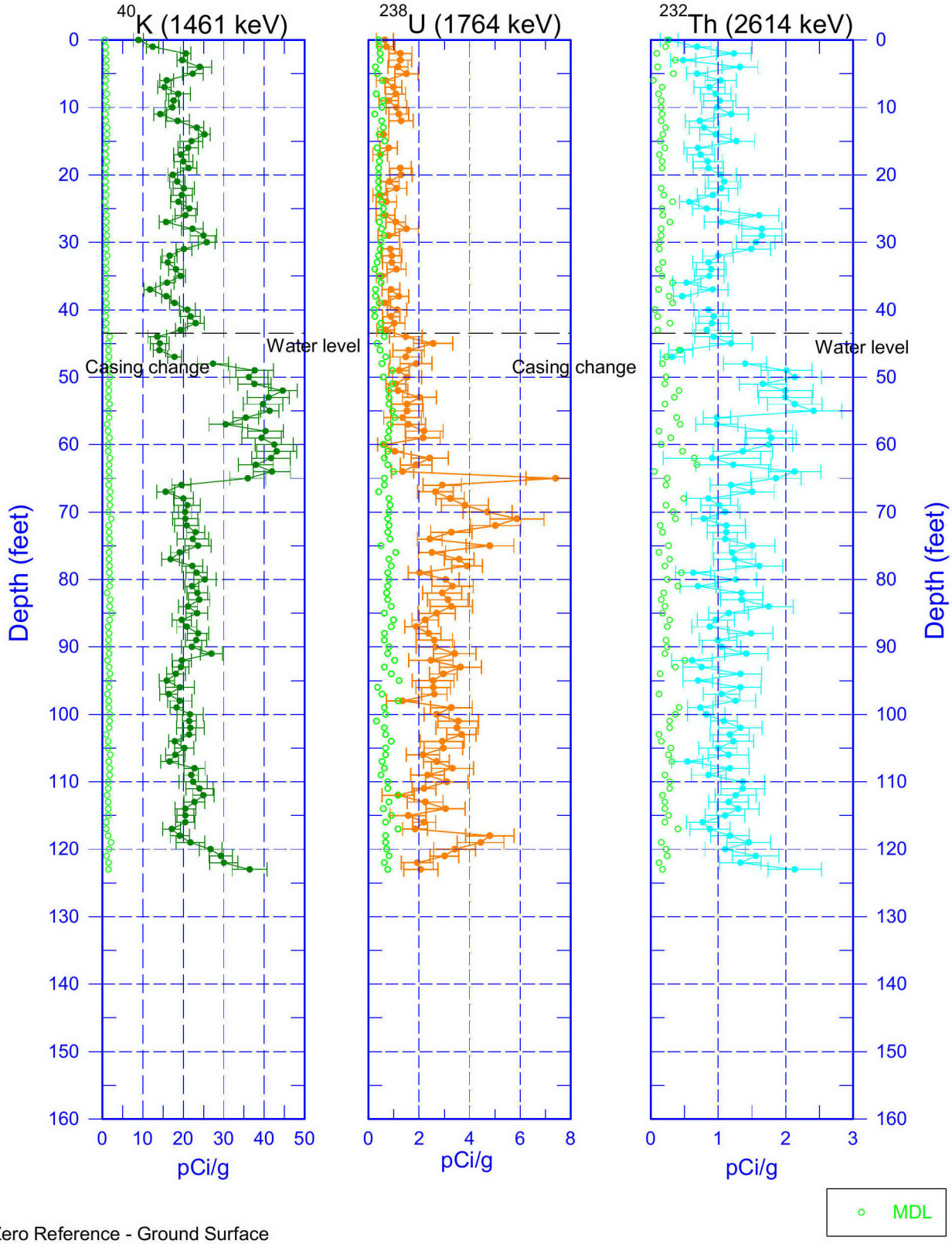
399-3-33 (C7663)
Manmade Radionuclides



Stoller Hanford Office

HGLP-LDR-528, Rev. 0

399-3-33 (C7663)
Natural Gamma Logs

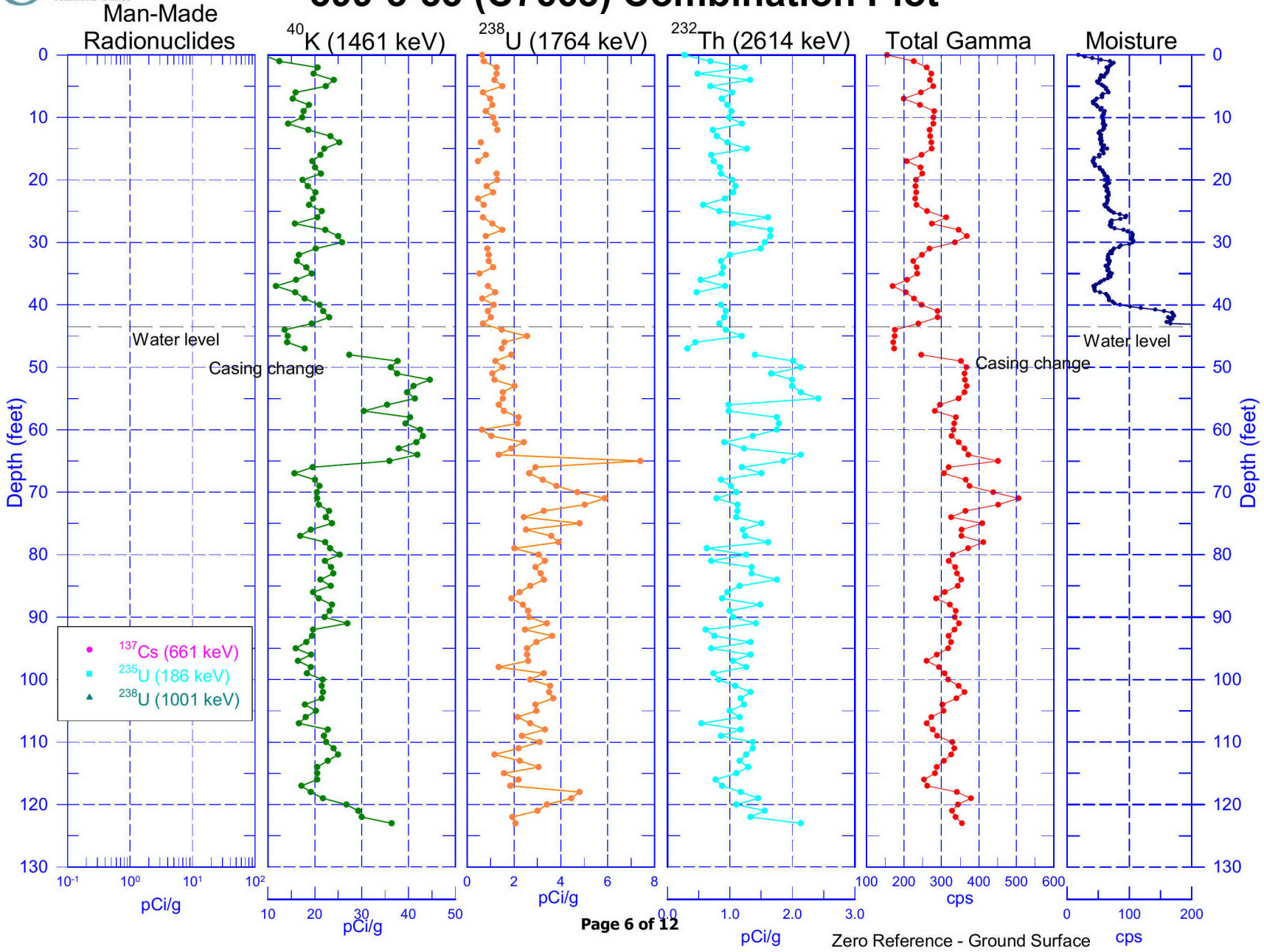


Zero Reference - Ground Surface

Stoller
Hanford Office

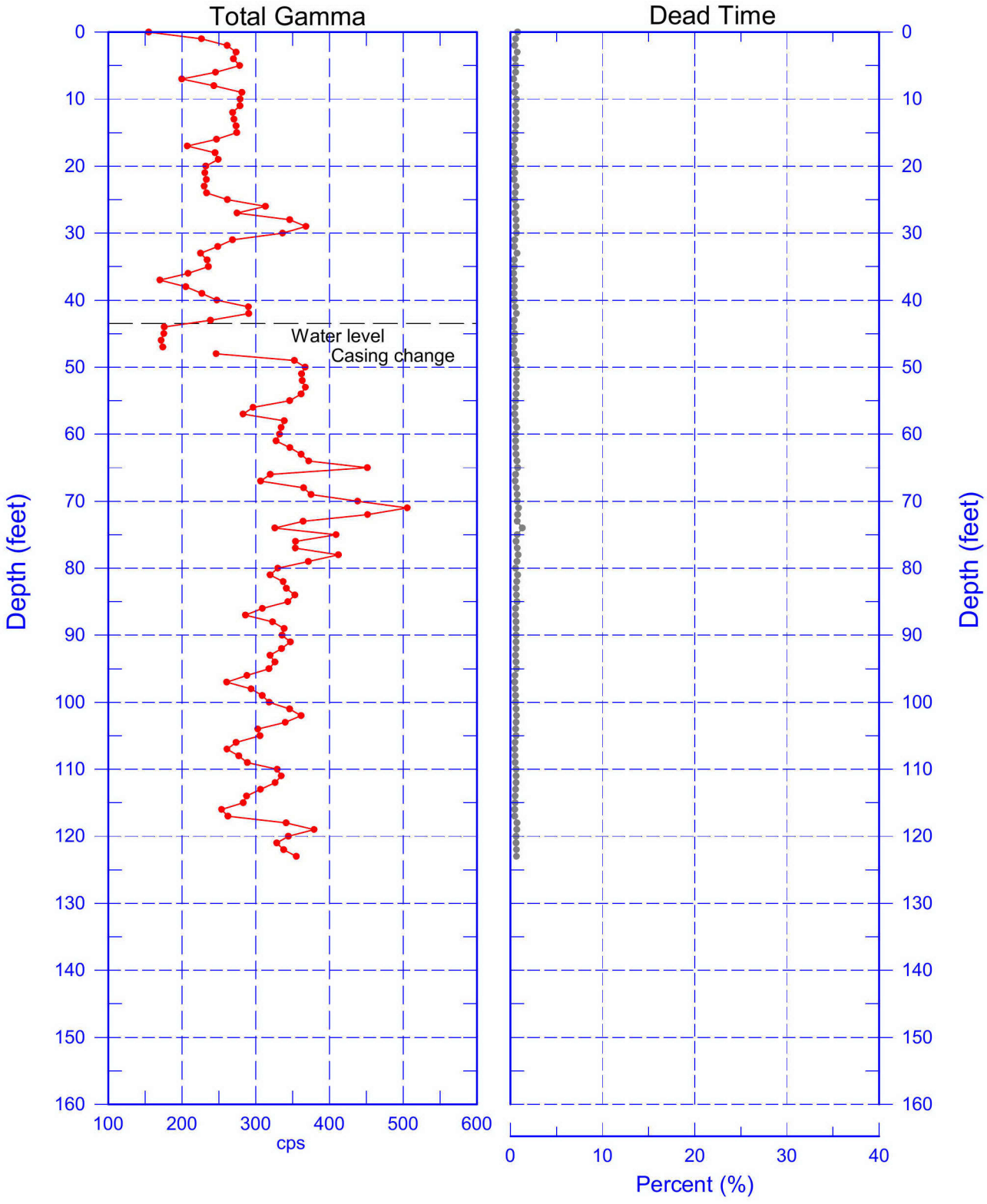
HGLP-LDR-528, Rev. 0

399-3-33 (C7663) Combination Plot



Stoller
Hanford Office

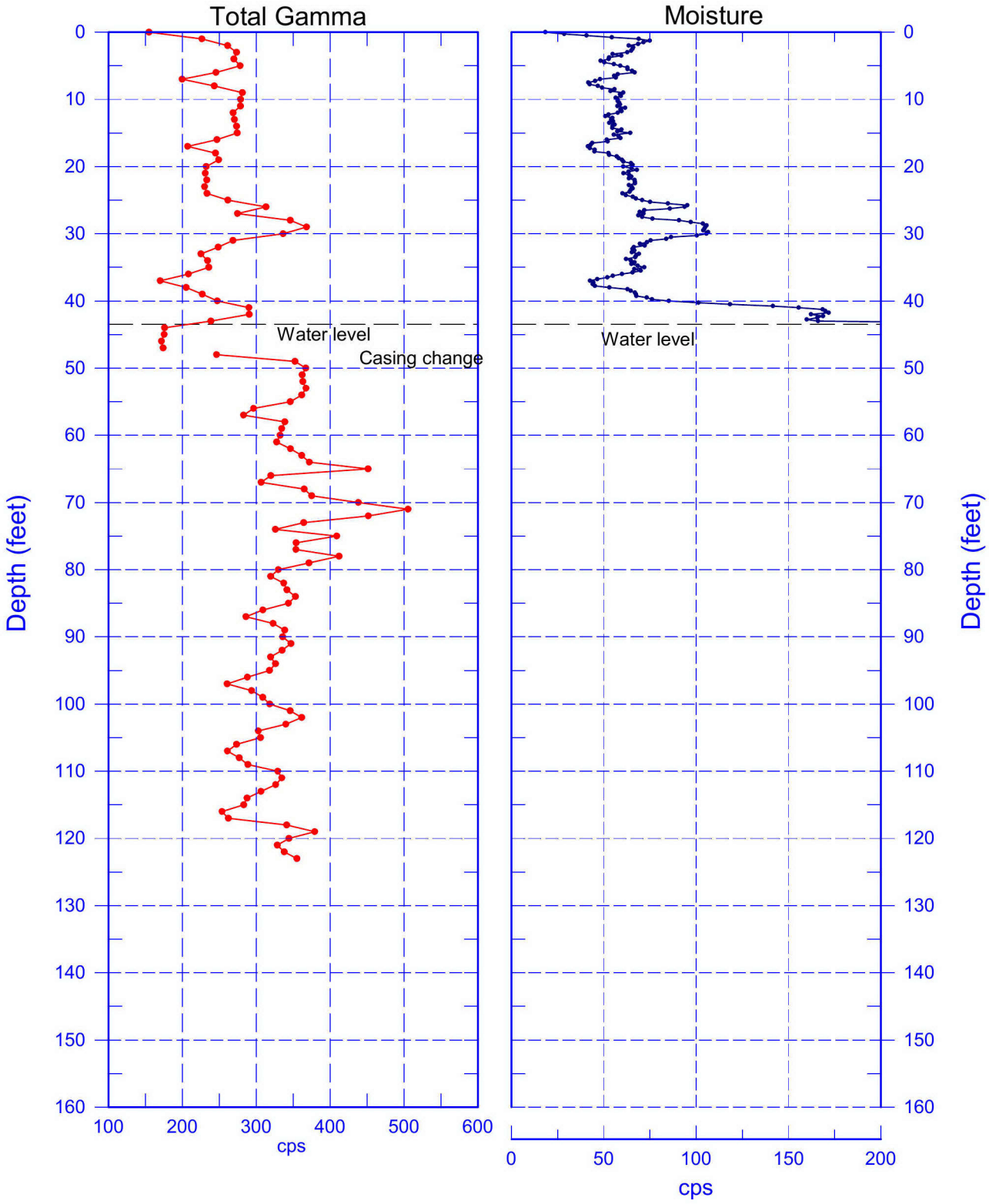
399-3-33 (C7663)
Total Gamma & Dead Time



Reference - Ground Surface

Stoller
Hanford Office

399-3-33 (C7663)
Total Gamma & Moisture

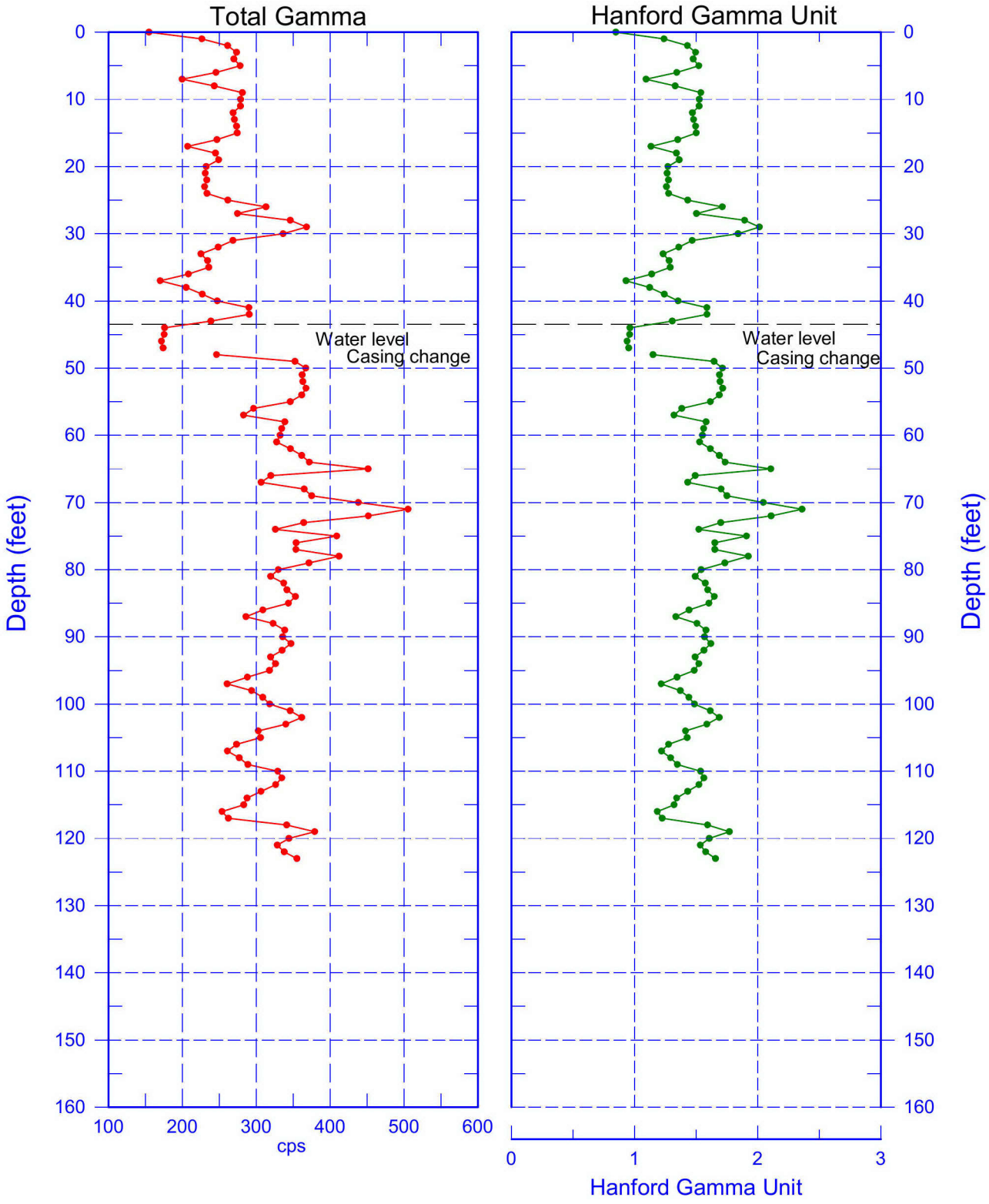


Reference - Ground Surface

Stoller Hanford Office

399-3-33 (C7663)

Total Gamma & Hanford Gamma Unit

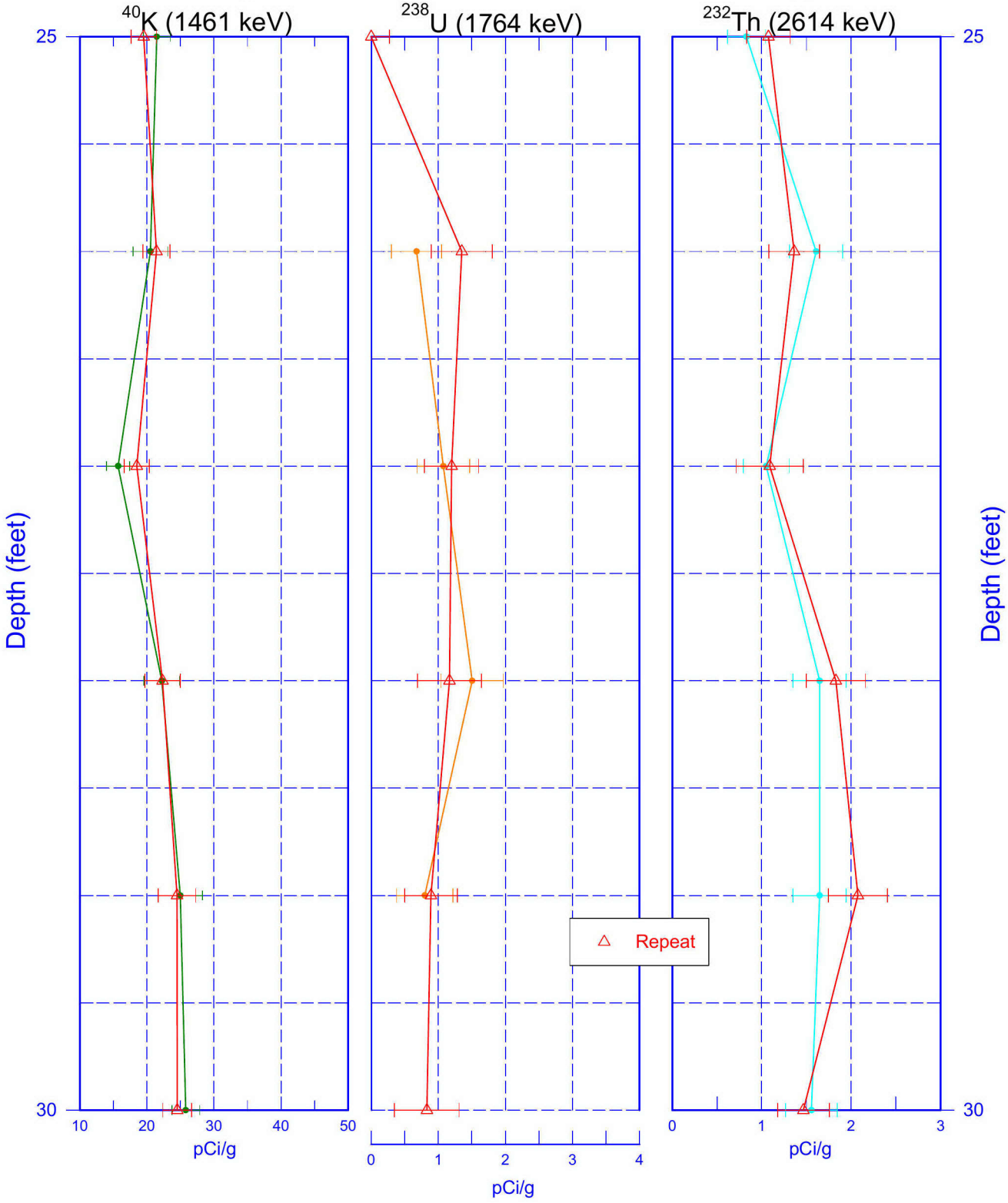


Reference - Ground Surface

Stoller Hanford Office

399-3-33 (C7663)

Repeat Section of Natural Gamma Logs

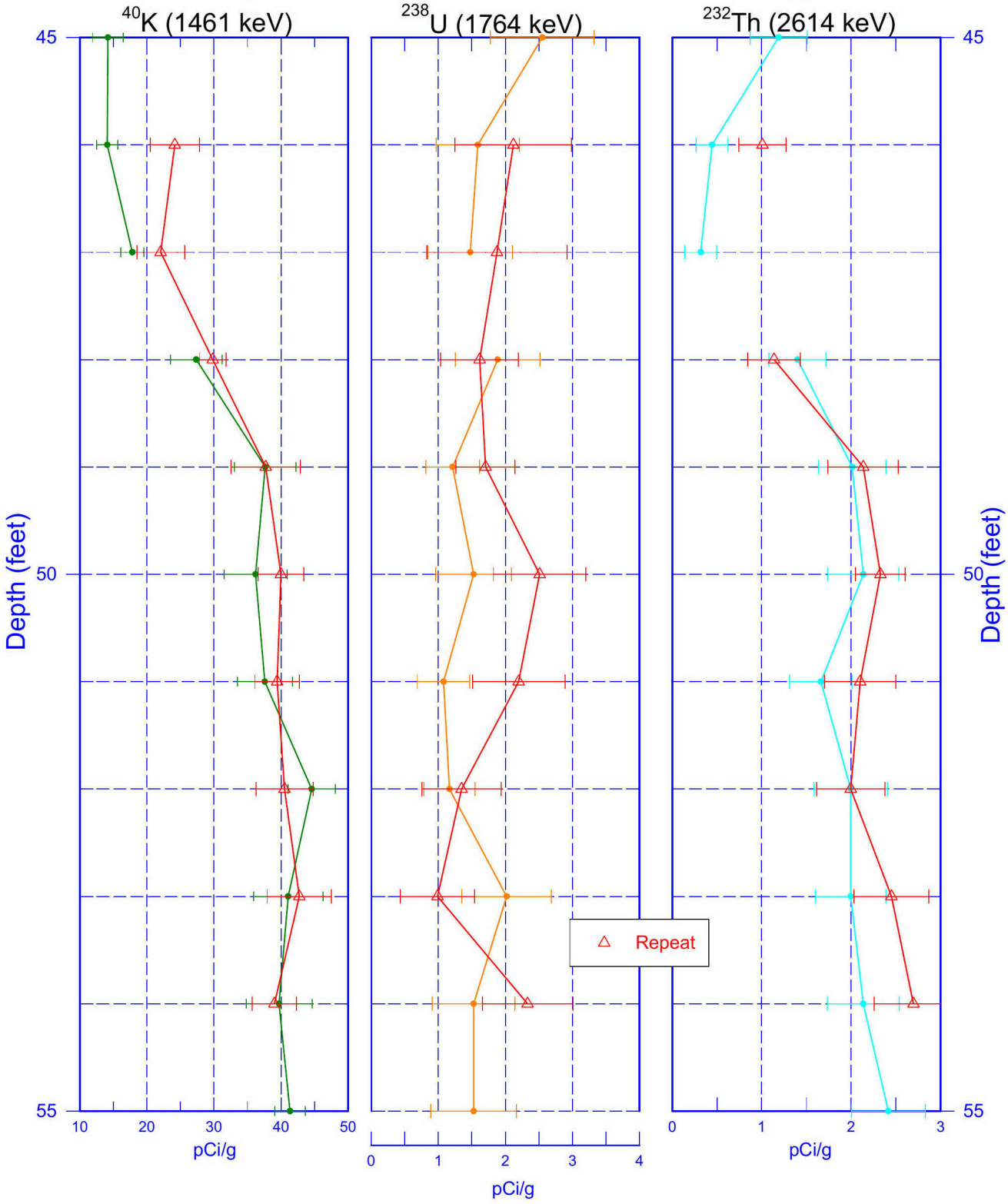


Zero Reference - Ground Surface

Stoller Hanford Office

399-3-33 (C7663)

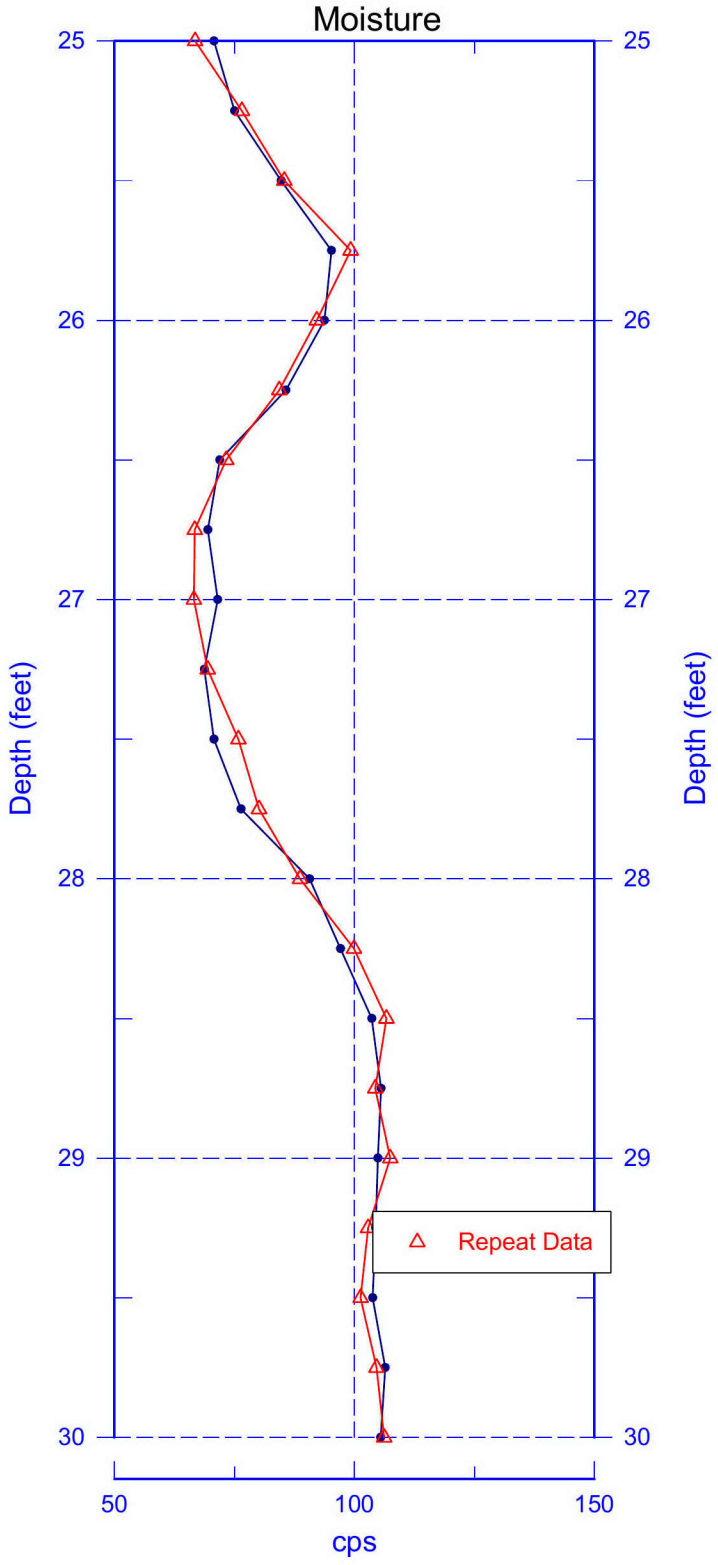
Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Stoller
Hanford Office

399-3-33 (C7663)
Moisture Repeat Section



Reference - Ground Surface

Stoller Hanford Office established 1959

HGLP-LDR-581, Rev. 0

399-1-61 (C8026)
Log Data Report

Borehole Information:

Log Date:	2011-02-26	**Filename:**	C8026_HG-NM_2011-02-06	**Site:**	300-FF-5
Coordinates (WA St Plane)		**GWL[1] (ft) :**	39.2	**GWL Date:**	2/26/11
North (m)	**East (m)**	**Drill Date**	**TOC[2] Elevation**	**Total Depth (ft)**	**Type**
Unknown	Unknown	2/25/11	Unknown	58.0	Sonic

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded Steel	1.4	8	7 1/4	3/8	1.4	58.0

Borehole Notes:

The well site geologist supplied the depth of casing and depth of borehole. The logging engineer measured depth to water and casing diameter (rounded to the nearest 1/16-in.).

Zero reference is ground surface.

Logging Equipment Information:

Logging System:	Gamma 1N		**Type:** **Serial No.:**	60% HPGe SGLS[3] 45-TP22010A
Effective Calibration Date:	12/21/10	**Calibration Reference:**	HGLP-CC-066, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Logging System:	Gamma 1H		**Type:** **Serial No.:**	NMLS[4] H310700352
Effective Calibration Date:	5/17/10	**Calibration Reference:**	HGLP-CC-058, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

SGLS Log Run Information:

Log Run	1	2 Repeat			
HEIS Number	1017793	1017794			
Date	2/26/11	2/26/11			
Logging Engineer	Pearson	Pearson			
Start Depth (ft)	59.0	12.0			
Finish Depth (ft)	0.0	6.0			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
Log Speed (ft/min)	N/A	N/A			
Pre-Verification	AN204CAB	AN204CAB			

[1] groundwater level
[2] top of casing
[3] Spectral Gamma Logging System
[4] Neutron Moisture Logging System

Log Run	1	2 Repeat			
Start File	AN204000	AN204060			
Finish File	AN204059	AN204066			
Post-Verification	AN204CAA	AN204CAA			
Depth Return Error (in.)	0.0	0.0			
Comments	No fine gain adjustments made	No fine gain adjustments made			

NMLS Log Run Information:

Log Run	3	4 Repeat			
HEIS Number	1017795	1017796			
Date	2/26/11	2/26/11			
Logging Engineer	Pearson	Pearson			
Start Depth (ft)	0.0	8.0			
Finish Depth (ft)	39.25	12.0			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
Log Speed (ft/min)	N/A	N/A			
Pre-Verification	AH077CAB	AH077CAB			
Start File	AH077000	AH077158			
Finish File	AH077157	AH077174			
Post-Verification	AH077CAA	AH077CAA			
Depth Return Error (in.)	N/A	1/2 high			
Comments	None	None			

Logging Operation Notes:

SGLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the KUTh-118 field verifier. A centralizer was installed on the sonde.

NMLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the AmBe standard field verifier. A centralizer was installed on the sonde.

Analysis Notes:

Analyst:	C. Nelson	Date:	3/17/11	Reference:	HGLP-MAN-003, REV. 0

Pre- and post-survey verification measurements met the acceptance criteria for the established systems.

A casing correction for 3/8-in. thick casing was applied during analysis from ground surface to 58 ft with the bottom one foot uncorrected. A water correction was applied from 40 ft to the total logged depth of the borehole.

SGLS spectra were processed in batch mode in APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated in an EXCEL template identified as AN20101221, using an efficiency function and corrections for casing and dead time as determined by annual calibrations.

During routine processing of gamma spectra, regions of interest are forced at specific energy levels associated with natural and manmade radionuclides that can be anticipated to be present. This processing approach sometimes results in an isolated "detection" near the MDL[5] resulting in a false positive. Where these detections occur, the

[5] minimum detection level

individual spectrum is scrutinized and a determination is made regarding the validity of the detection. If the detection is deemed not representative of a full energy peak, or if confirming peaks are not detected, it is removed from the data set. The integrity of the raw data files and the processed files are maintained should questions arise in the future regarding these determinations.

NMLS data are presented in counts per second because no calibration data exists for a 7 1/4-in. inner diameter casing.

The HGU[6] is an empirical unit of gamma activity proposed as a means to standardize gamma log response across multiple logging systems with different response characteristics. The HGU is defined in terms of measurements in the Hanford Borehole Calibration Facility, and the magnitude is selected such that 1 HGU is approximately equivalent to typical Hanford background activity, based on data from background samples as reported in *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12).

Results and Interpretations:

No manmade radionuclides were detected in this borehole. Although not detected, MDLs for Cs-137, U-235, and U-238 (Pa-234m) are plotted on the manmade radionuclides plot.

Radon appears to exist below the water table resulting in enhanced naturally occurring U-238.

The neutron moisture log primarily responds to moisture present in the surrounding formation. In general, an increase in count rate reflects an increase in moisture content. Moisture content may increase in sediments of relatively high silt or clay content.

The KUT and moisture repeat plots indicate that the respective systems were working properly.

List of Log Plots:

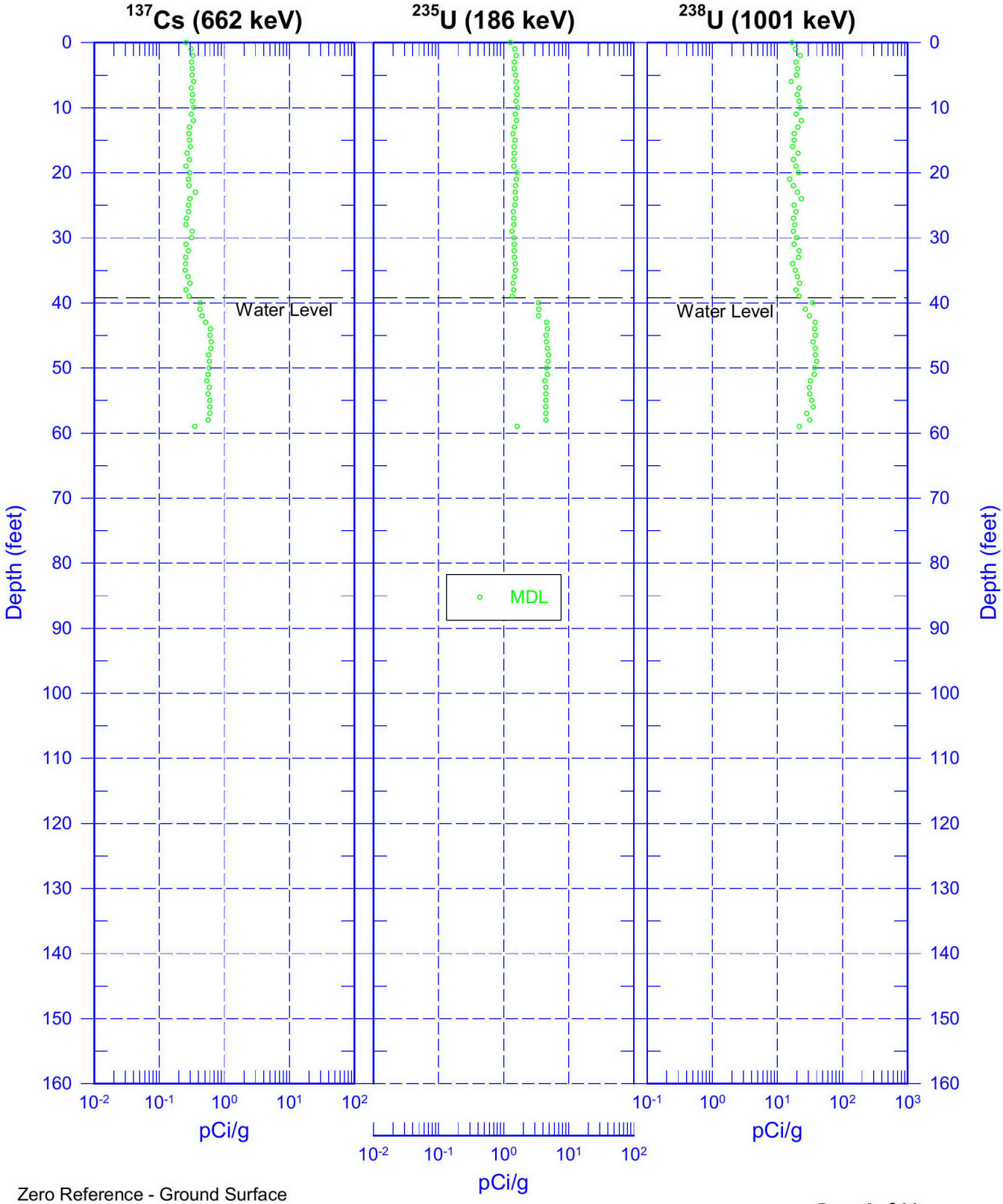
Depth Reference is ground surface

Manmade Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma & Dead Time
Total Gamma & Moisture
Total Gamma & Hanford Gamma Unit
Repeat Section of Natural Gamma Logs
Moisture Repeat Section

[6] Hanford Gamma Unit

Stoller Hanford Office

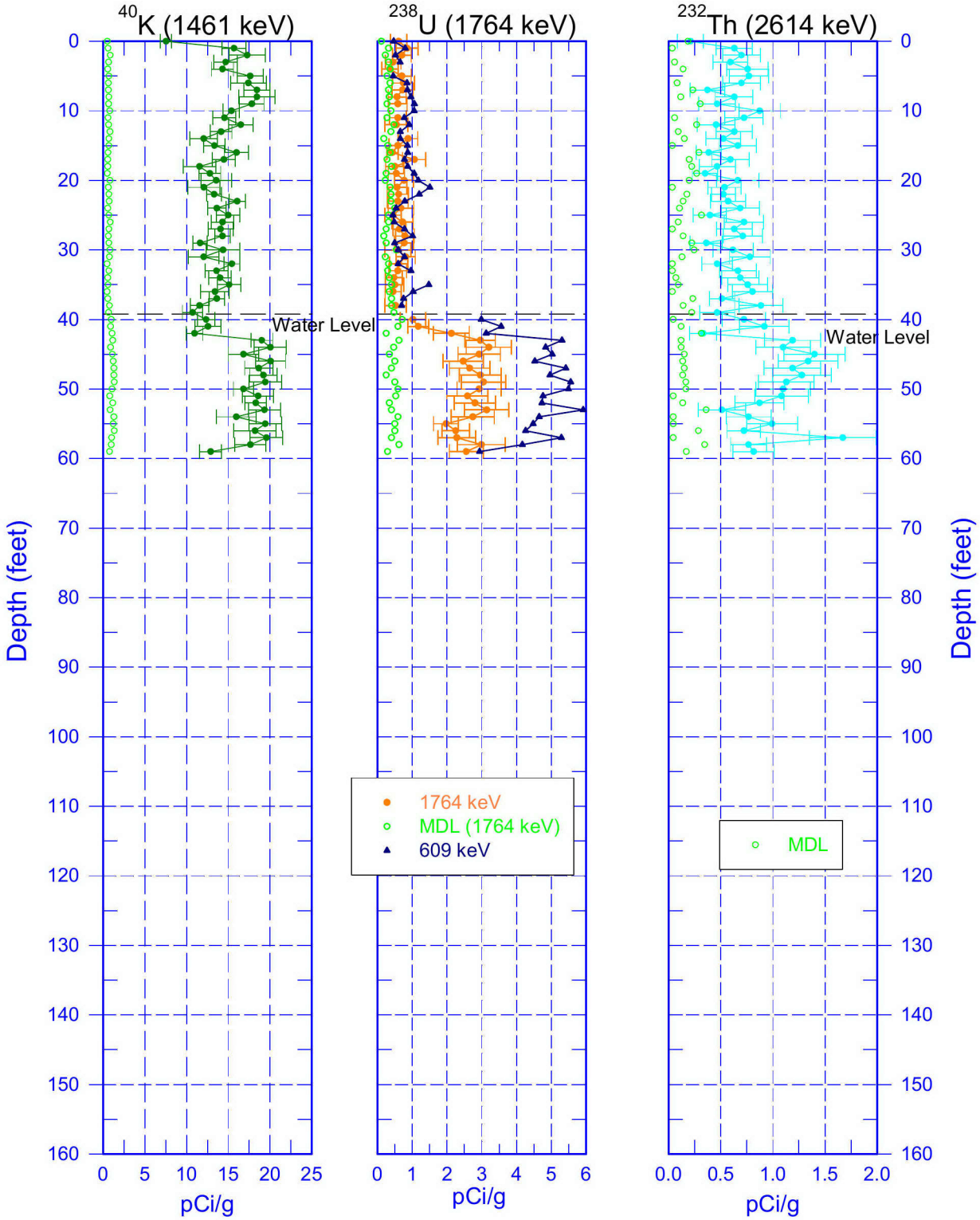
399-1-61 (C8026)
Manmade Radionuclides



Zero Reference - Ground Surface

Stoller Hanford Office

399-1-61 (C8026)
Natural Gamma Logs

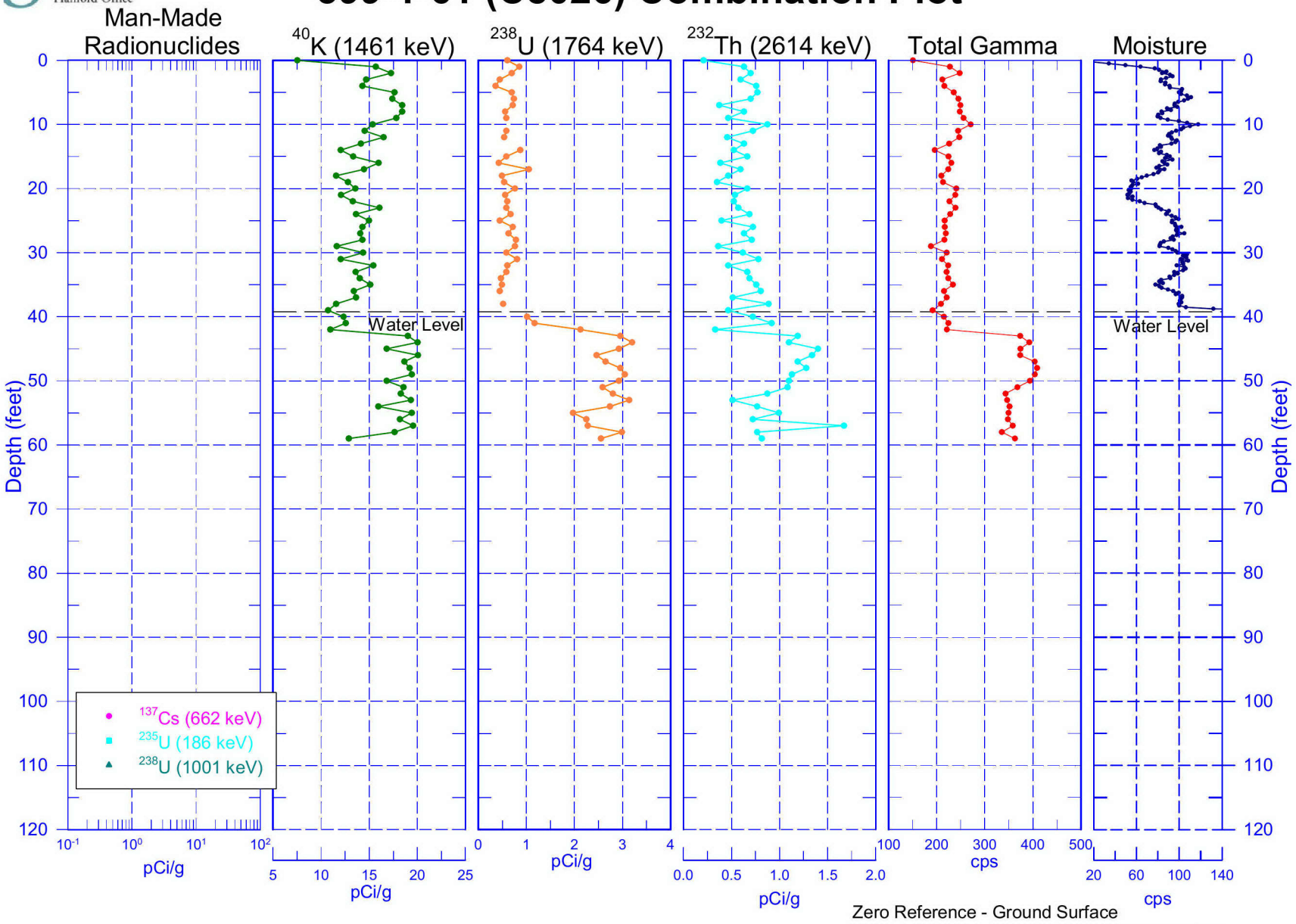


Zero Reference - Ground Surface

Stoller
Hanford Office

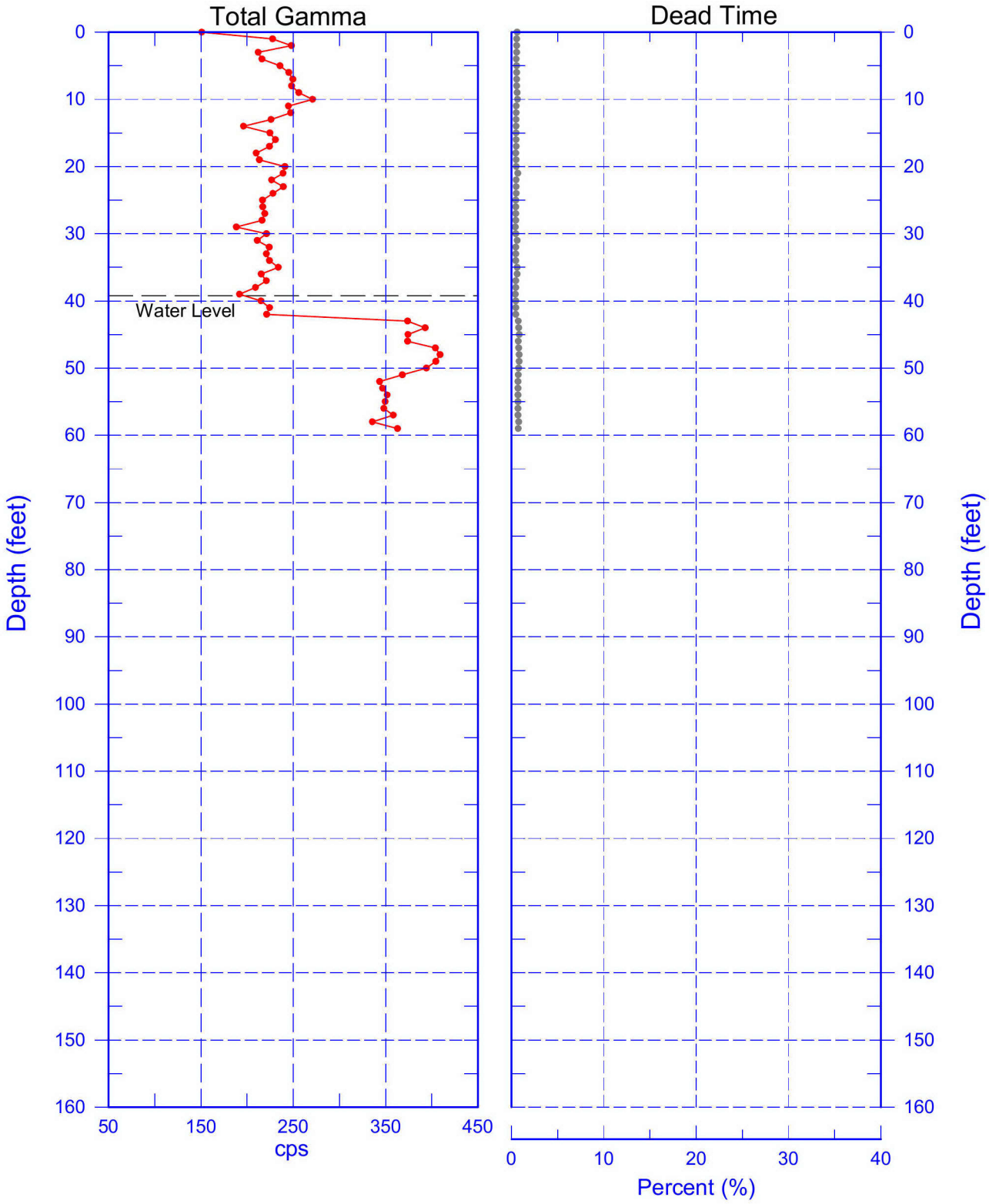
HGLP-LDR-581, REV. 0

399-1-61 (C8026) Combination Plot



Stoller Hanford Office

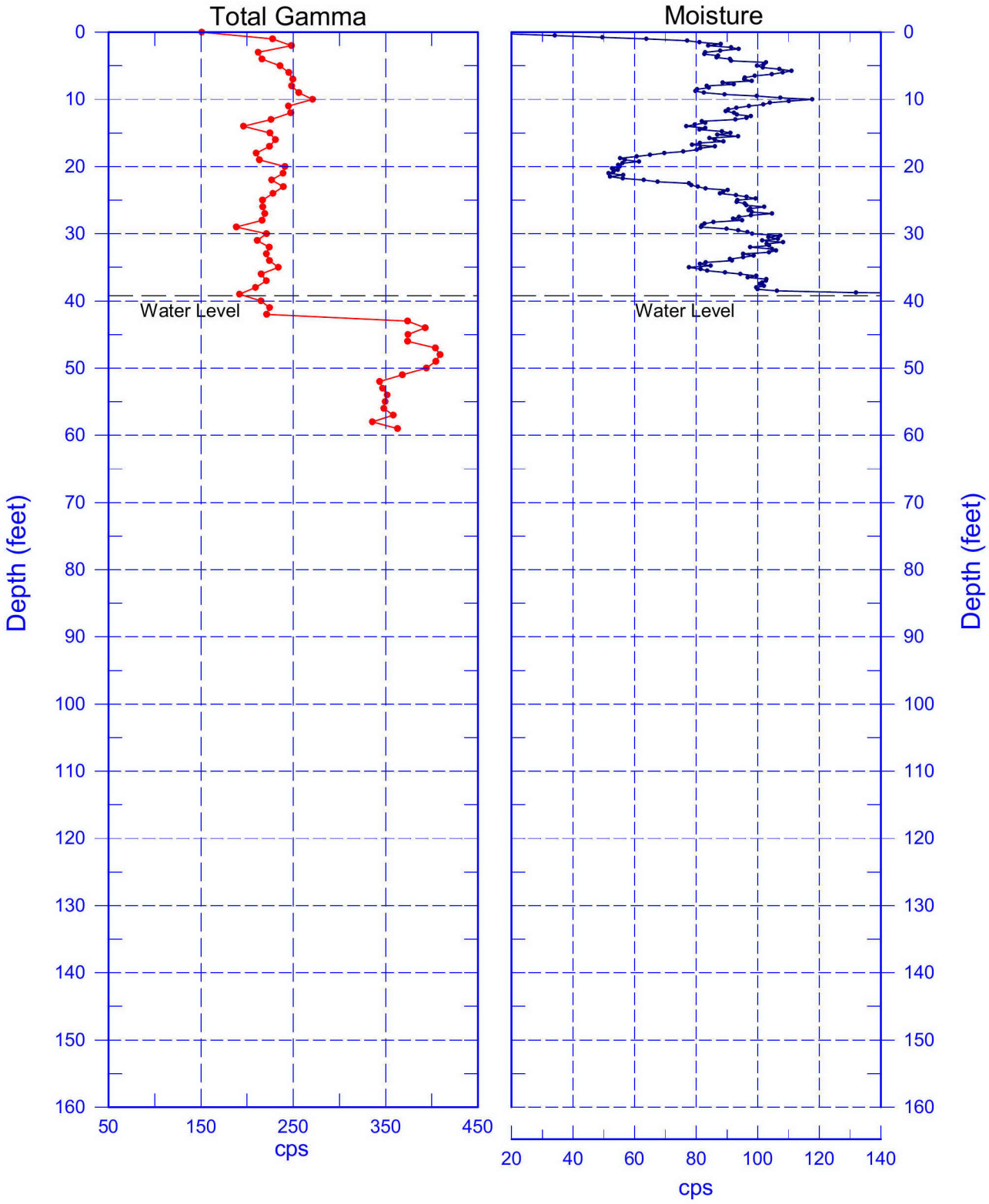
399-1-61 (C8026)
Total Gamma & Dead Time



Reference - Ground Surface

Stoller
Hanford Office

399-1-61 (C8026)
Total Gamma & Moisture

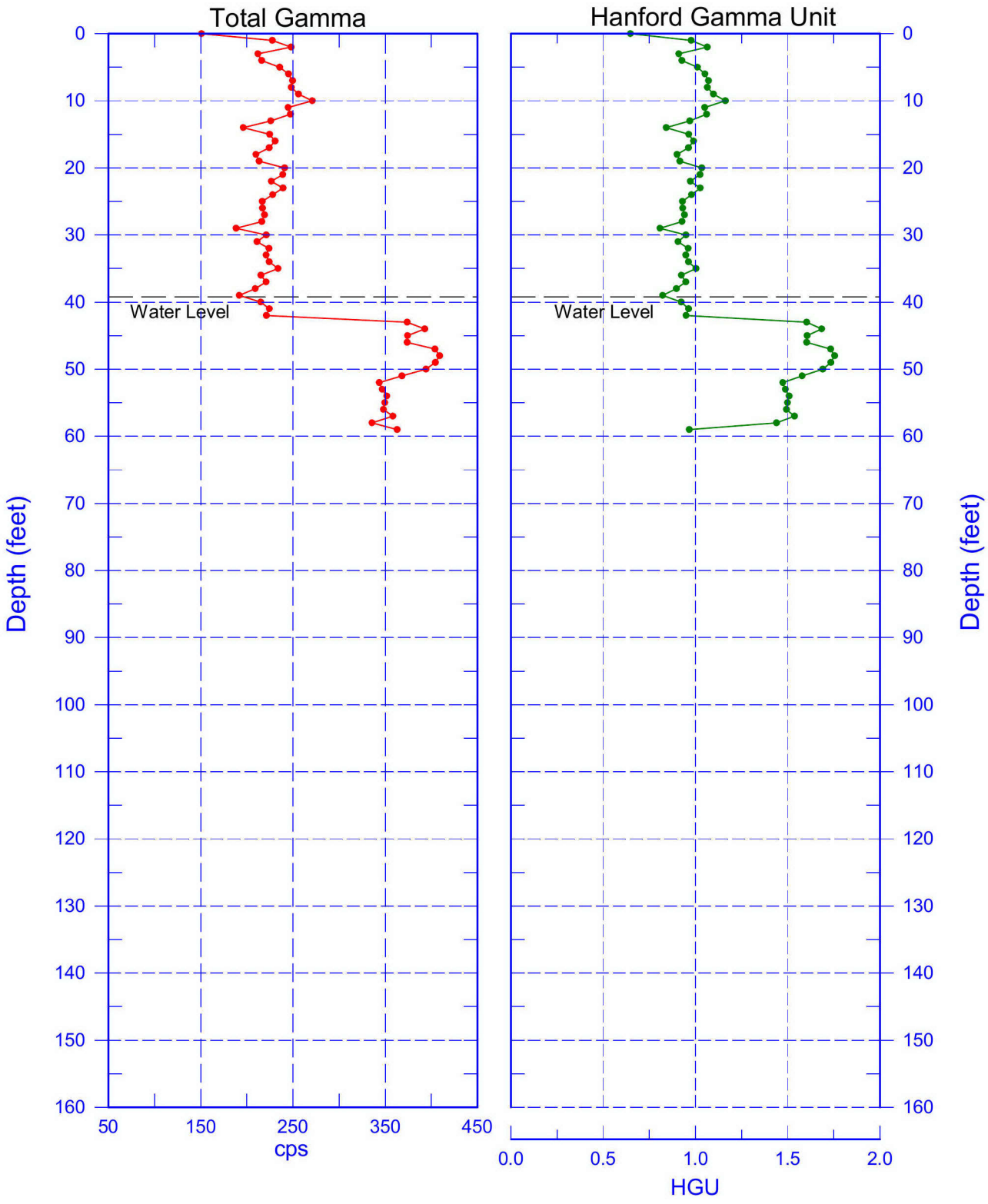


Reference - Ground Surface

Stoller Hanford Office

399-1-61 (C8026)

Total Gamma & Hanford Gamma Unit

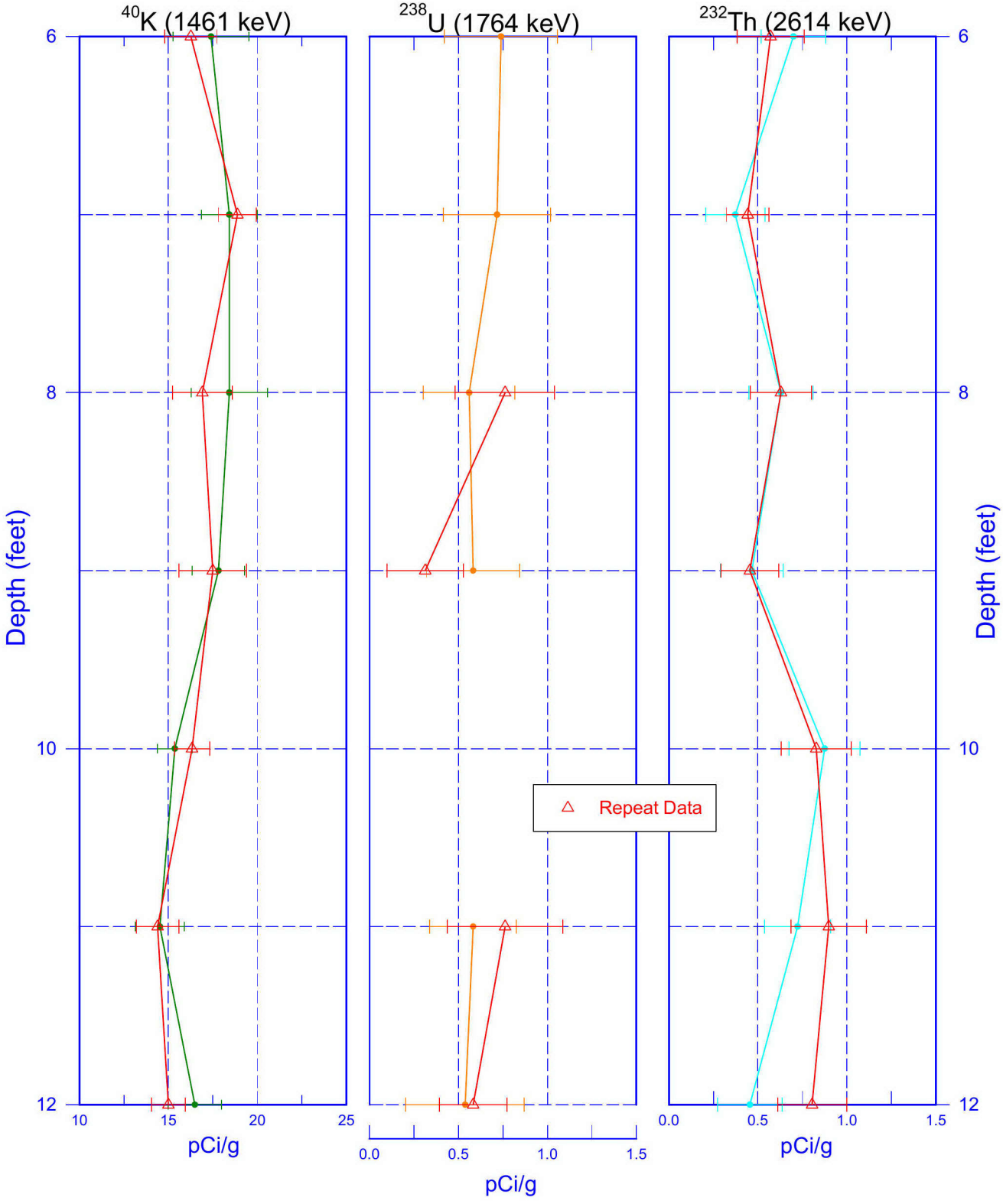


Reference - Ground Surface

Stoller Hanford Office

399-1-61 (C8026)

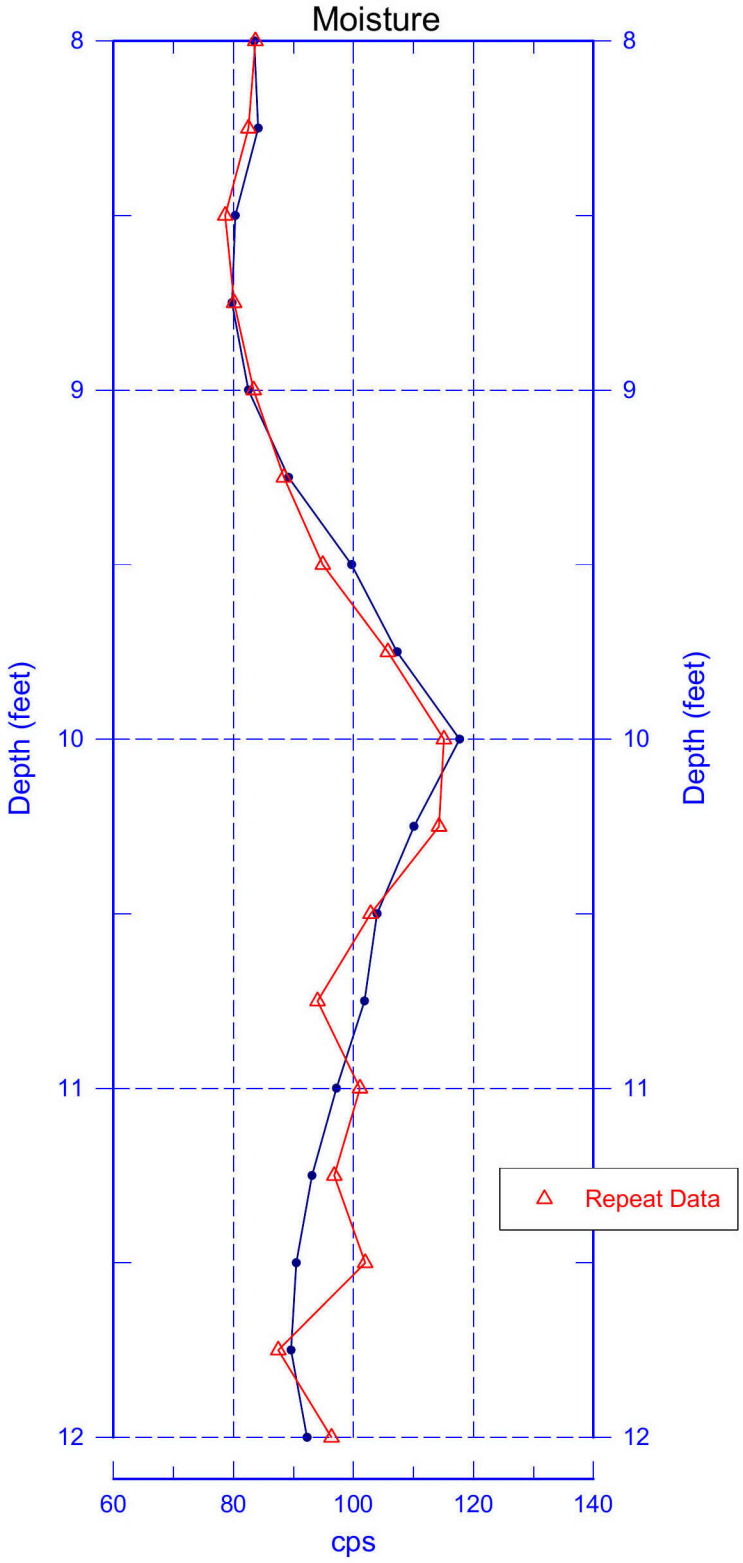
Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Stoller
Hanford Office

399-1-61 (C8026)
Moisture Repeat Section



Reference - Ground Surface

Stoller Hanford Office established 1959

HGLP-LDR-593, Rev. 0

399-1-62 (C8027)
Log Data Report

Borehole Information:

Log Date:	2011-02-26	Filename:	C8027_HG-NM_2011-02-26	Site:	300-FF-5
Coordinates (WA St Plane)		GWL[1] (ft):	30.3	GWL Date:	2/26/11
North (m)	East (m)	Drill Date	TOC[2] Elevation	Total Depth (ft)	Type
Unknown	Unknown	2/25/11	Unknown	46.0	Sonic

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded Steel	2.7	8	7 1/4	3/8	2.7	47.0

Borehole Notes:

The buyer's technical representative provided depth of casing and depth of borehole. The logging engineer measured casing stick-up, casing diameters (rounded to the nearest 1/16-in.), and depth to water.

The zero reference is the ground surface.

Logging Equipment Information:

Logging System:	Gamma 1 N		Type: Serial No.:	60% HPGe SGLS[3] 45-TP22010A
Effective Calibration Date:	12/21/10	Calibration Reference:	HGLP-CC-066, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Logging System:	Gamma 1 H		Type: Serial No.:	NMLS[4] H310700352
Effective Calibration Date:	5/17/10	Calibration Reference:	HGLP-CC-058, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

SGLS Log Run Information:

Log Run	1	2 Repeat			
HEIS Number	1017563	1017564			
Date	2/26/11	2/26/11			
Logging Engineer	Pearson	Pearson			
Start Depth (ft)	45.0	8.0			
Finish Depth (ft)	0.0	3.0			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
Log Speed (ft/min)	N/A	N/A			
Pre-Verification	AN205CAB	AN205CAB			

[1] groundwater level
[2] top of casing
[3] Spectral Gamma Logging System
[4] Neutron Moisture Logging System

Log Run	1	2 Repeat			
Start File	AN205000	AN205046			
Finish File	AN205045	AN205051			
Post-Verification	AN205CAA	AN205CAA			
Depth Return Error (in.)	0.0	0.0			
Comments	No fine gain adjustments made	No fine gain adjustments made			

NMLS Log Run Information:

Log Run	3	4 Repeat			
HEIS Number	1017565	1017566			
Date	2/26/11	2/26/11			
Logging Engineer	Pearson	Pearson			
Start Depth (ft)	0.0	24.0			
Finish Depth (ft)	30.0	27.0			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
Log Speed (ft/min)	N/A	N/A			
Pre-Verification	AH078CAB	AH078CAB			
Start File	AH078000	AH078121			
Finish File	AH078120	AH078133			
Post-Verification	AH078CAA	AH078CAA			
Depth Return Error (in.)	N/A	0.0			
Comments	None	None			

Logging Operation Notes:

SGLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the KUTh-118 field verifier. A centralizer was installed on the sonde.

NMLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the AmBe standard field verifier. A centralizer was installed on the sonde.

Analysis Notes:

Analyst:	LEGLER	Date:	3/23/2011	Reference:	HGLP-MAN-003, Rev. 0

Pre- and post-survey verification measurements met the acceptance criteria for the established systems.

A casing correction for 3/8-in. thick casing was applied during analysis.

A water correction was applied from 31 feet to the total logged depth of the borehole.

SGLS spectra were processed in batch mode in APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated in an EXCEL template identified as AN20101221, using an efficiency function and corrections for casing and dead time as determined by annual calibrations.

During routine processing of gamma spectra, regions of interest are forced at specific energy levels associated with natural and manmade radionuclides that can be anticipated to be present. This processing approach sometimes results in an isolated "detection" near the MDL[5] resulting in a false positive. Where these detections occur, the

[5] minimum detection level

individual spectrum is scrutinized and a determination is made regarding the validity of the detection. If the detection is deemed not representative of a full energy peak, or if confirming peaks are not detected, it is removed from the data set. The integrity of the raw data files and the processed files are maintained should questions arise in the future regarding these determinations.

The NMLS data are presented in counts per second because no calibration data exists for a 7 1/4-in. inside diameter casing.

The HGU[6] is an empirical unit of gamma activity proposed as a means to standardize gamma log response across multiple logging systems with different response characteristics. The HGU is defined in terms of measurements in the Hanford Borehole Calibration Facility, and the magnitude is selected such that 1 HGU is approximately equivalent to typical Hanford background activity, based on data from background samples as reported in *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12).

Results and Interpretations:

No manmade radionuclides were detected in this borehole. Although not detected, MDLs for Cs-137, U-235, and U-238 (Pa-234m) are plotted on the manmade radionuclides plot.

The neutron moisture log primarily responds to moisture present in the surrounding formation. In general, an increase in count rate reflects an increase in moisture content. Moisture content may increase in sediments of relatively high silt or clay content.

The repeat plots indicate that the respective systems were working properly.

List of Log Plots:

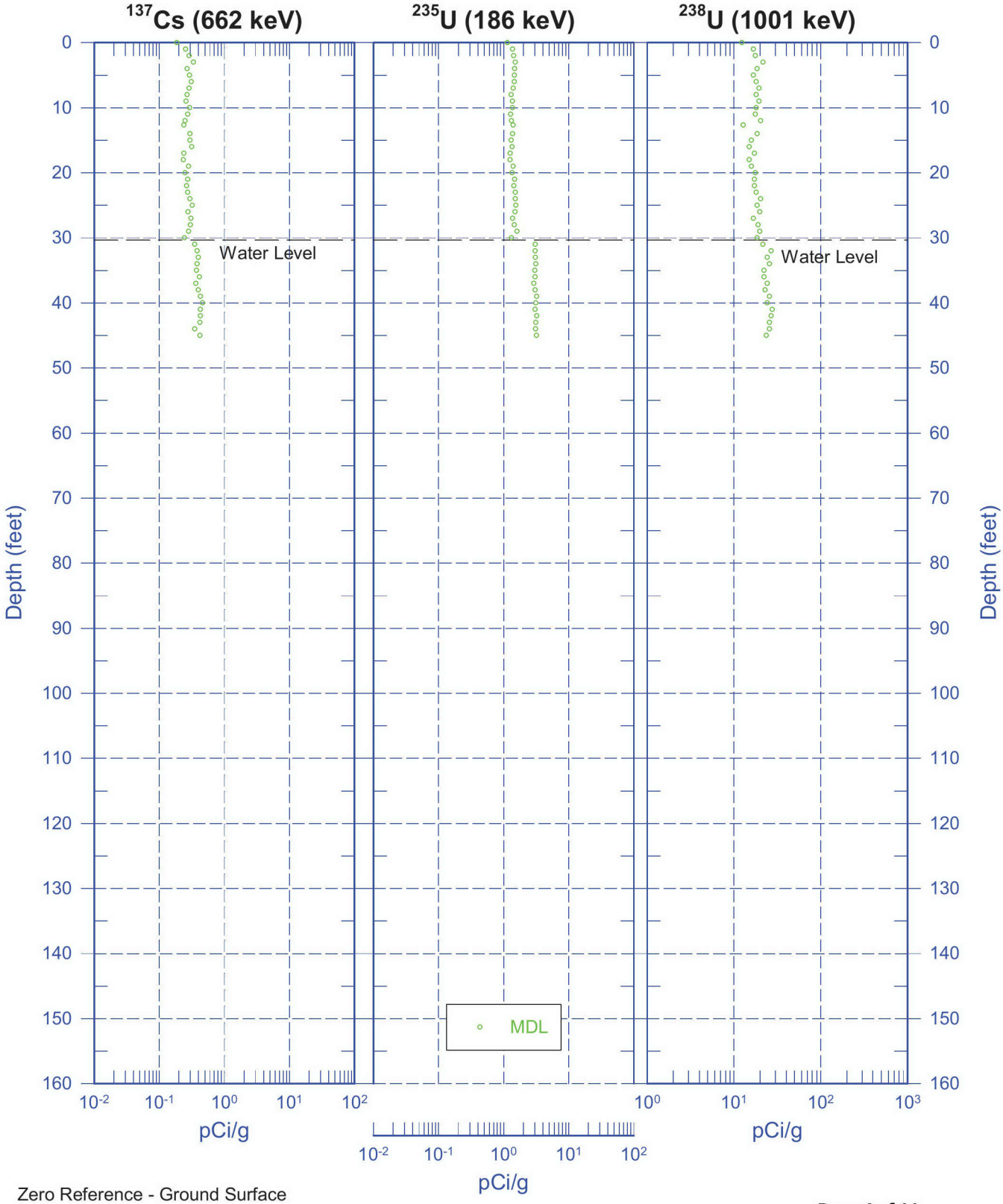
Depth Reference is ground surface

Manmade Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma & Dead Time
Total Gamma & Moisture
Total Gamma & Hanford Gamma Unit
Repeat Section of Natural Gamma Logs
Moisture Repeat Section

[6] Hanford Gamma Unit

Stoller Hanford Office

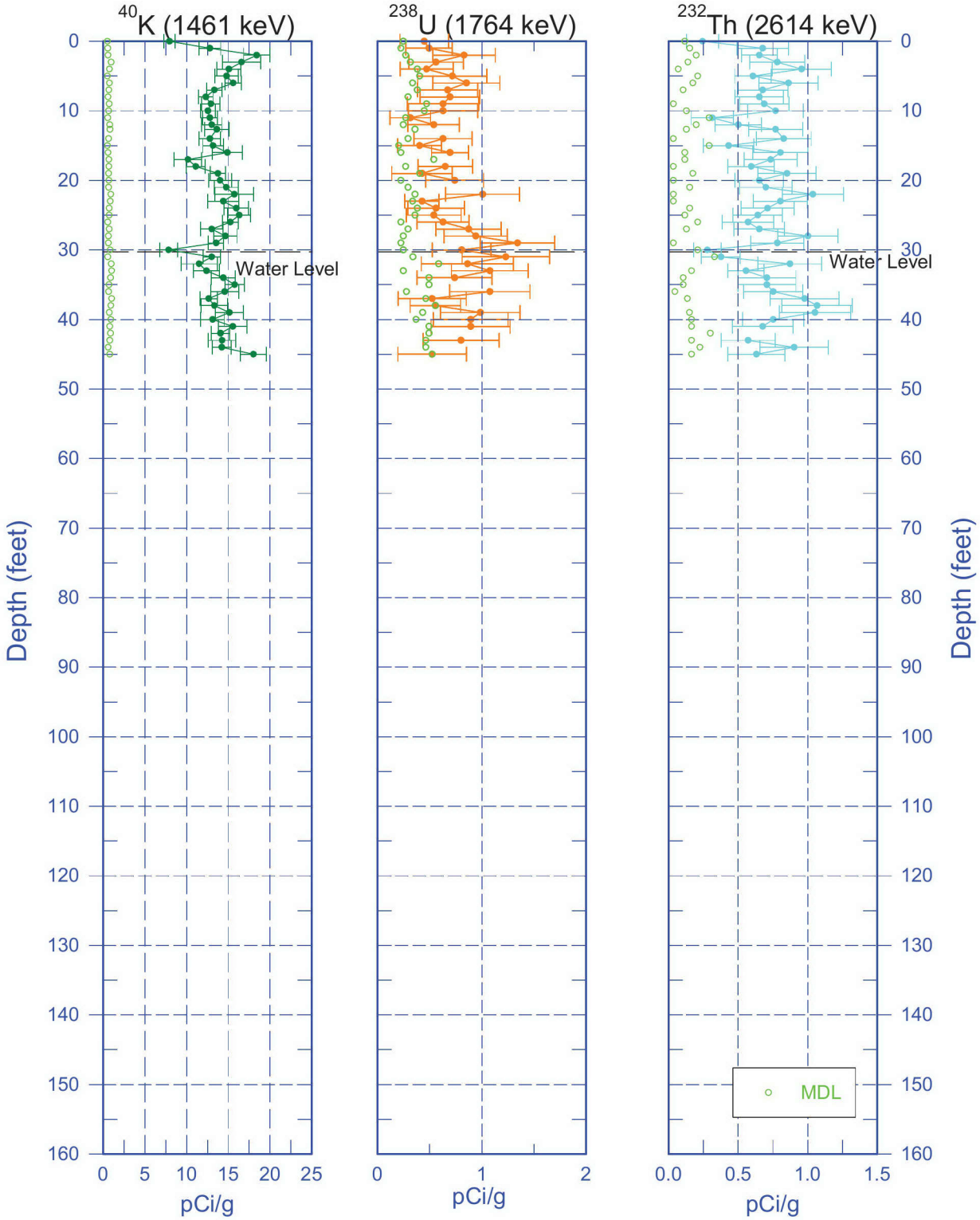
399-1-62 (C8027)
Manmade Radionuclides



Zero Reference - Ground Surface

Stoller Hanford Office

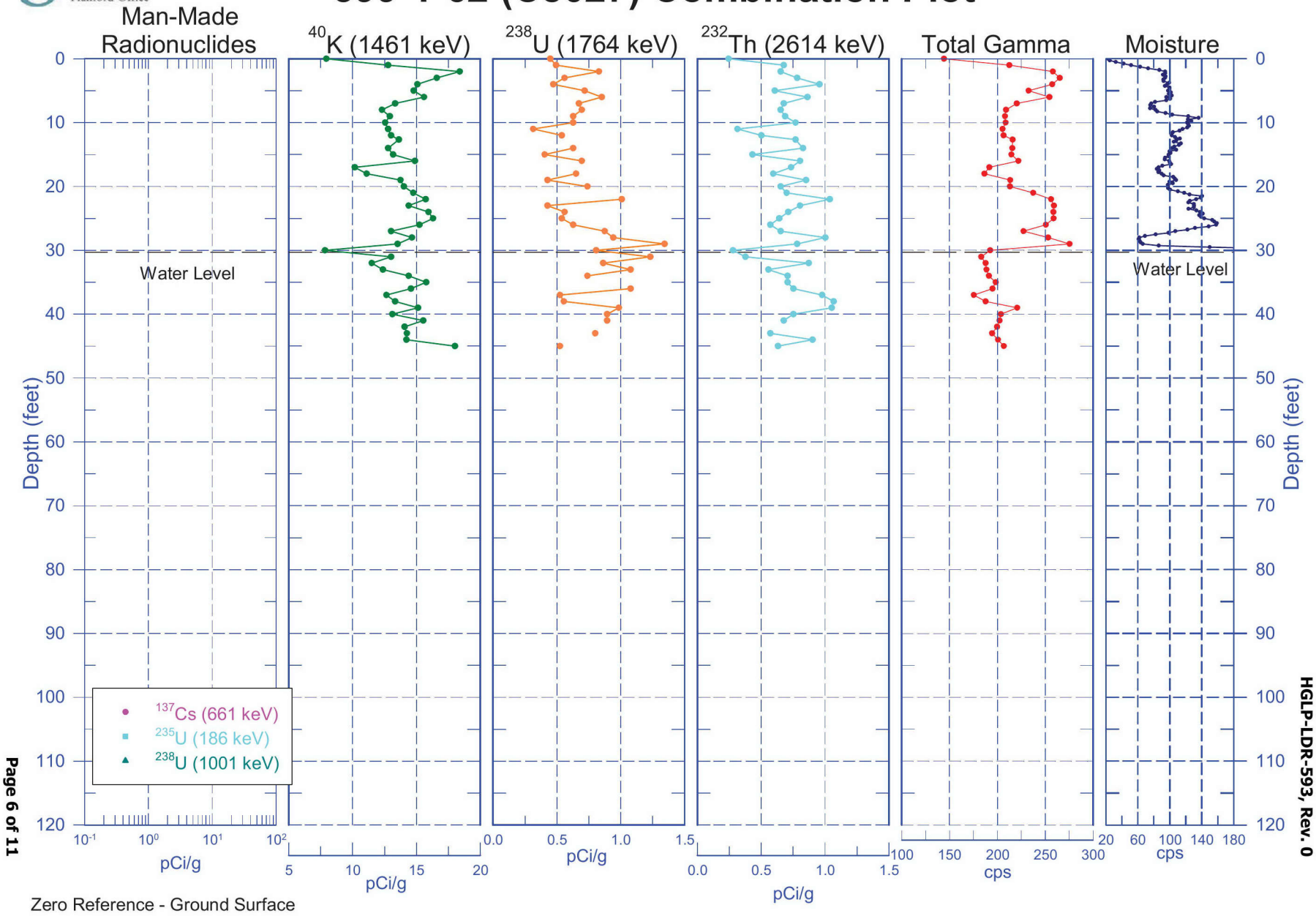
399-1-62 (C8027)
Natural Gamma Logs



Zero Reference - Ground Surface

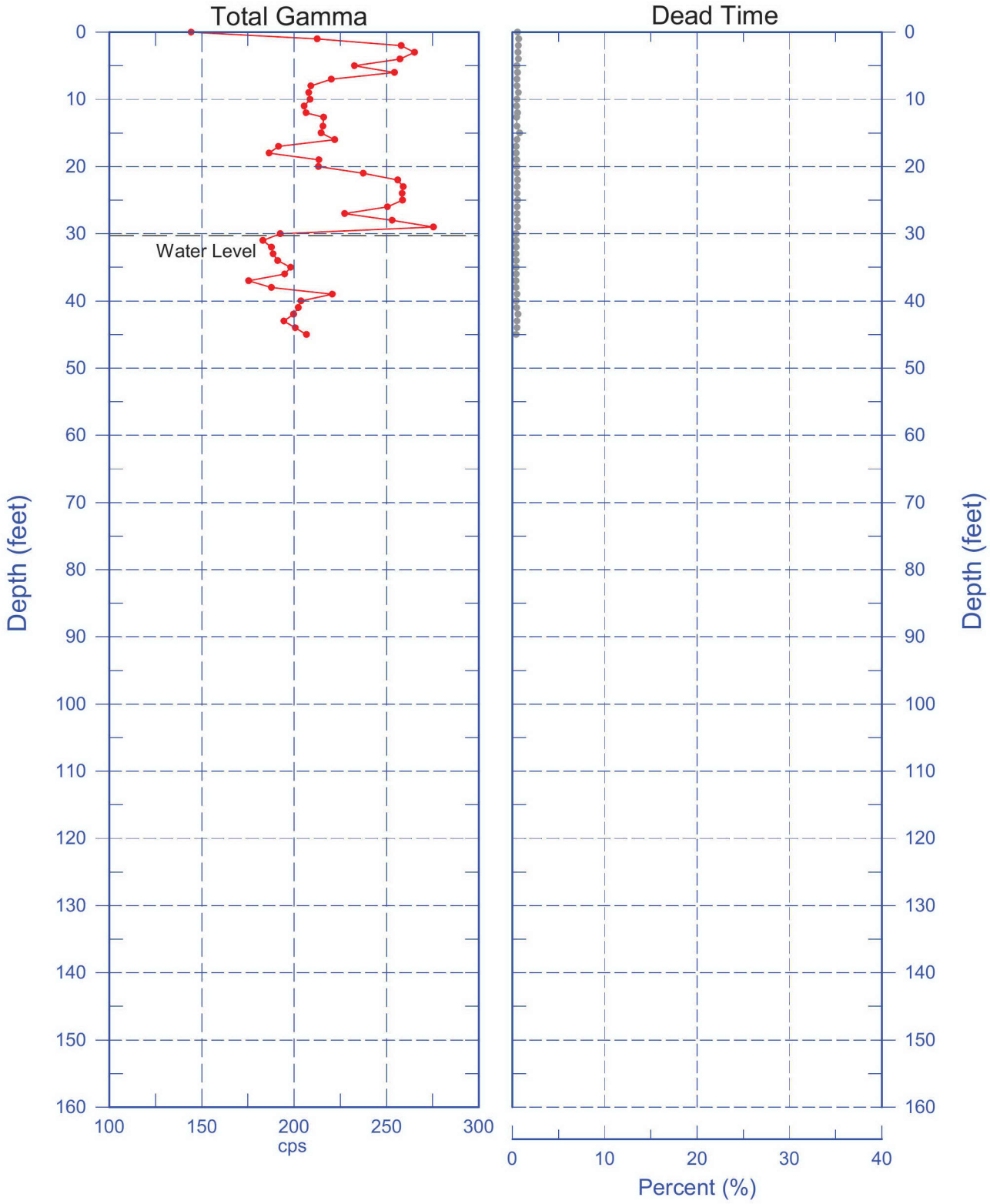
Stoller
Hanford Office

399-1-62 (C8027) Combination Plot



Stoller
Hanford Office

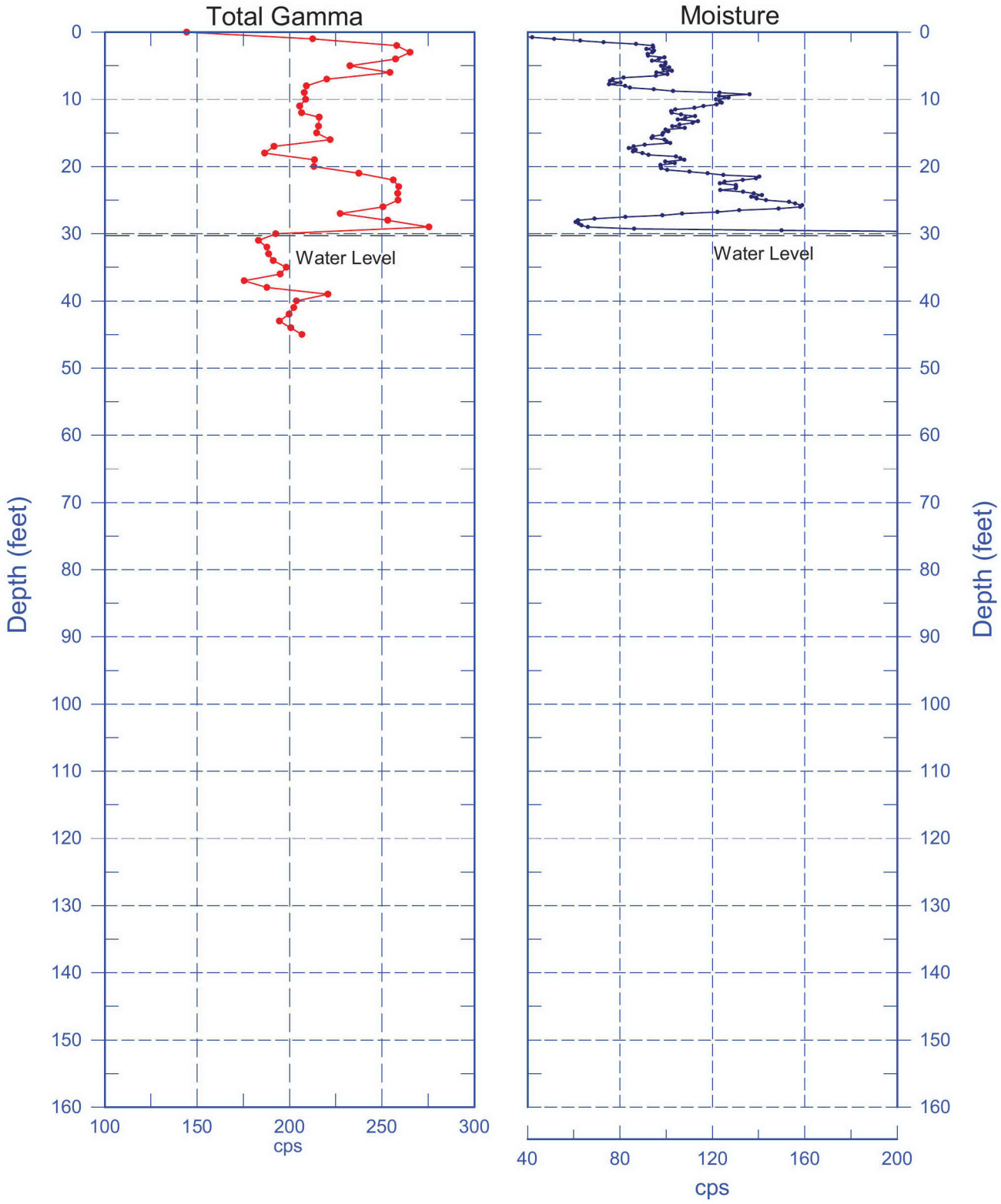
399-1-62 (C8027)
Total Gamma & Dead Time



Reference - Ground Surface

Stoller
Hanford Office

399-1-62 (C8027)
Total Gamma & Moisture

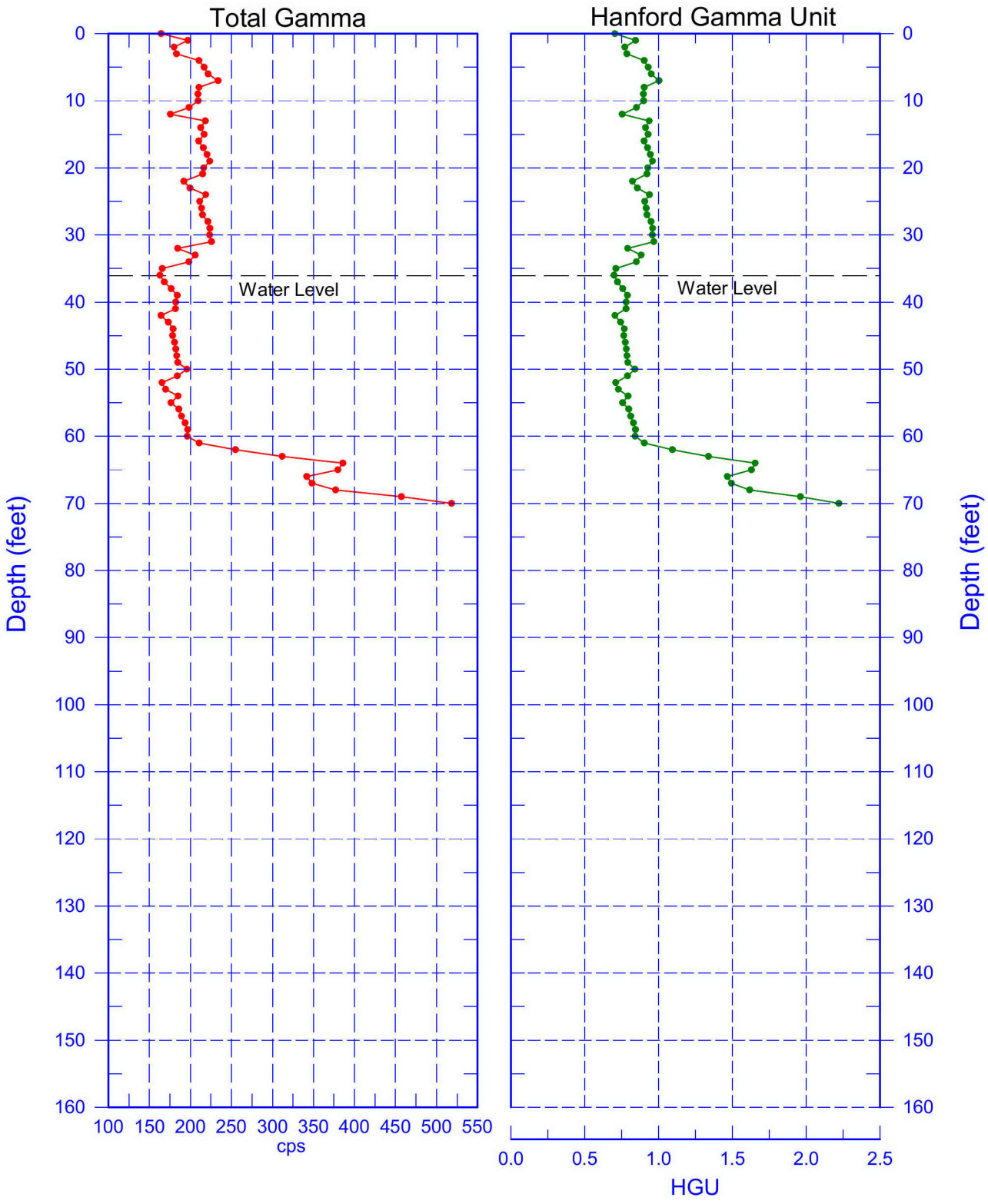


Reference - Ground Surface

Stoller Hanford Office

399-1-60 (C7867)

Total Gamma & Hanford Gamma Unit

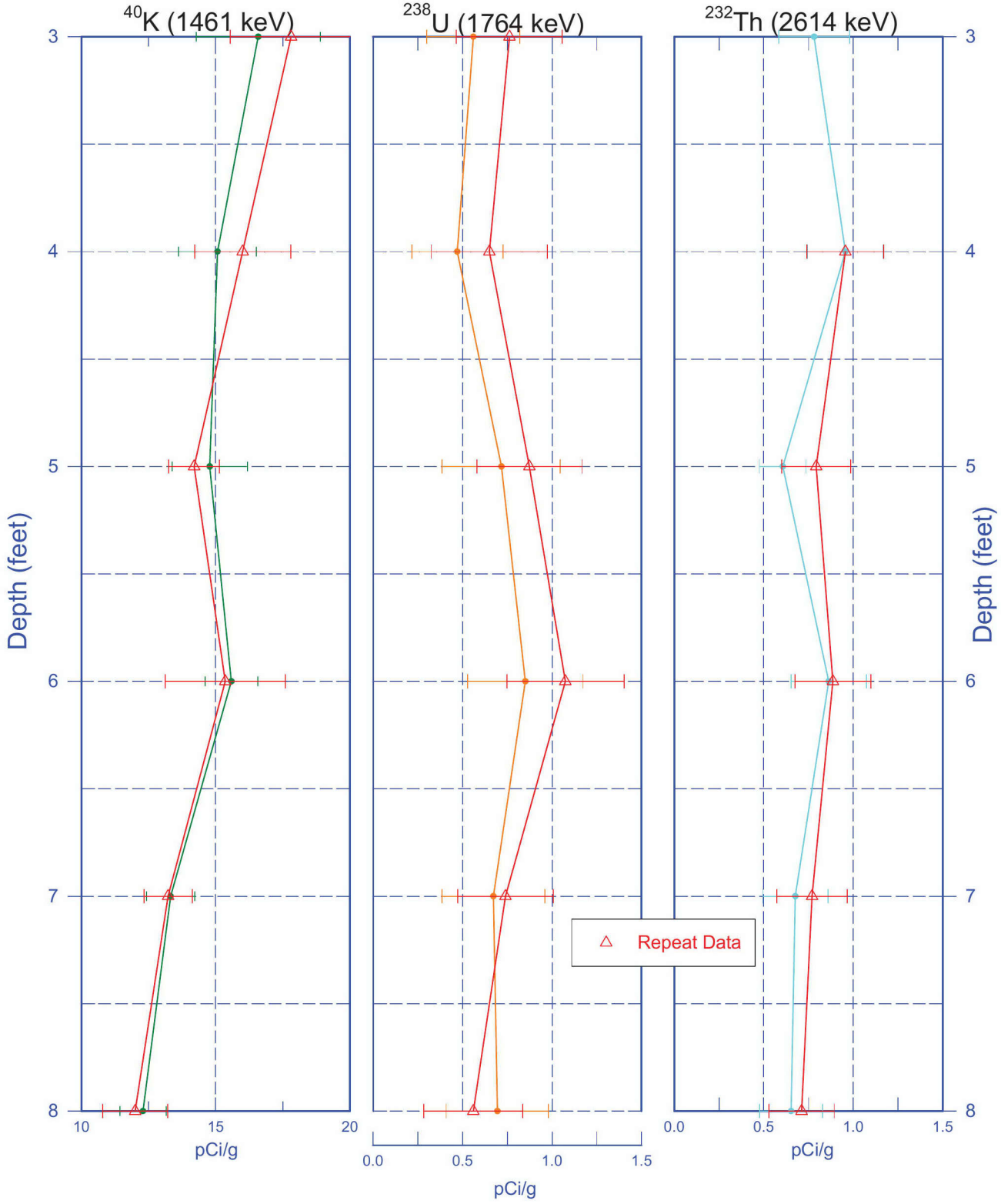


Reference - Ground Surface

Stoller Hanford Office

399-1-62 (C8027)

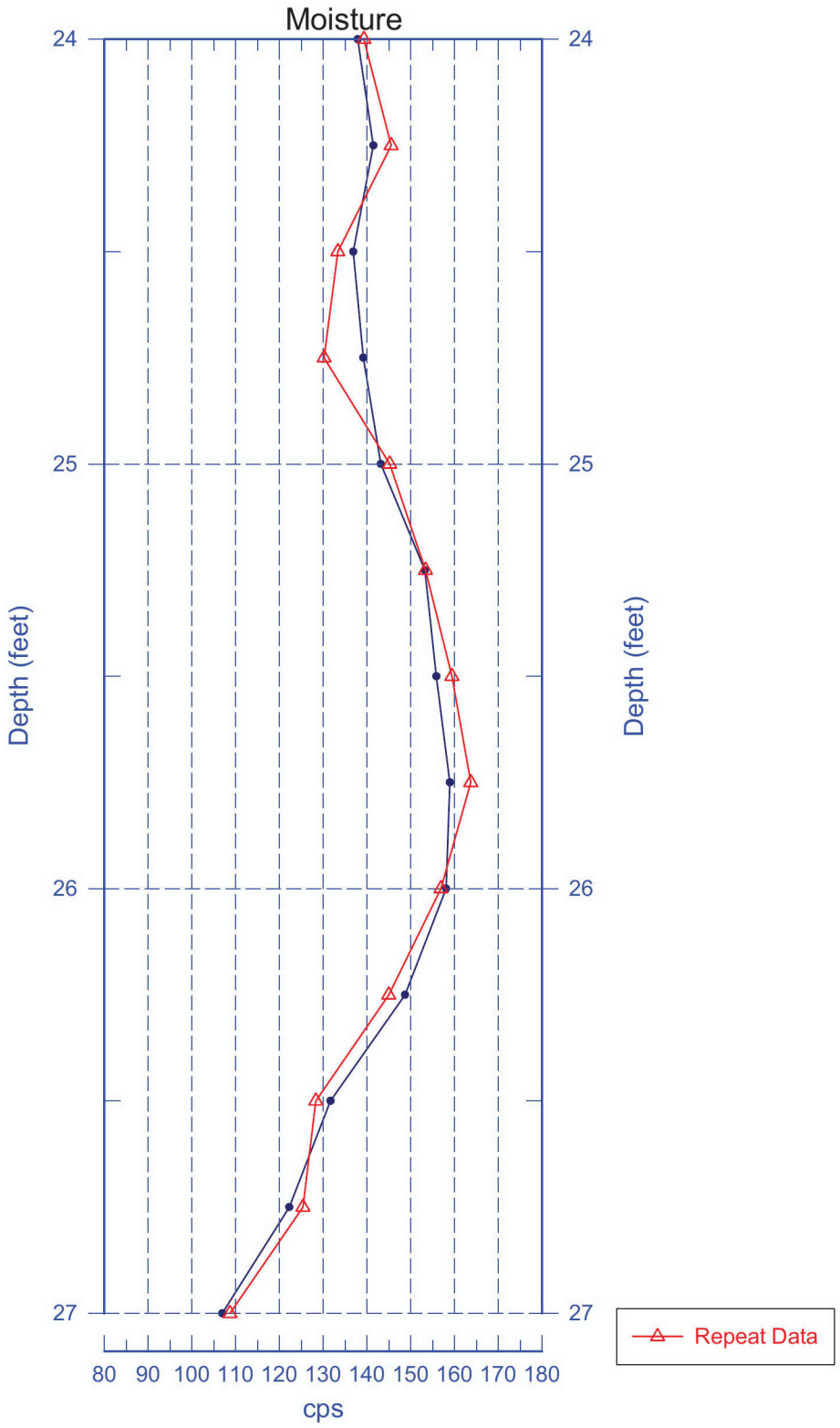
Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Stoller
Hanford Office

399-1-62 (C8027)
Moisture Repeat Section



Reference - Ground Surface

Stoller Hanford Office established 1959

HGLP-LDR-582, Rev. 0

399-1-63 (C8028)
Log Data Report

Borehole Information:

Log Date:	2011-03-02	Filename:	C8028_HG-NM_2011-03-02	Site:	300-FF-5
Coordinates (WA St Plane)		GWL[1] (ft):	37.7	GWL Date:	3/2/11
North (m)	East (m)	Drill Date	TOC[2] Elevation	Total Depth (ft)	Type
Unknown	Unknown	3/2/11	Unknown	55.5	Sonic

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded Steel	5.4	8	7 1/4	3/8	5.4	55.5

Borehole Notes:

The BTR[3] provided the depth of the borehole and depth of casing. The logging engineer measured casing diameters (rounded to the nearest 1/16-in.). Depth to water inside the casing at the time of logging was 18.4 ft, which may not be the static water level in the formation. The BTR reported the water level at 37.7 ft.

Zero reference is ground surface.

Logging Equipment Information:

Logging System:	Gamma 1N		Type: Serial No.:	60% HPGe SGLS[4] 45-TP22010A
Effective Calibration Date:	12/21/10	Calibration Reference:	HGLP-CC-066, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Logging System:	Gamma 1H		Type: Serial No.:	NMLS[5] H310700352
Effective Calibration Date:	5/17/10	Calibration Reference:	HGLP-CC-058, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

SGLS Log Run Information:

Log Run	1	2 Repeat			
HEIS Number	1017797	1017798			
Date	3/2/11	3/2/11			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	0.0	10.0			
Finish Depth (ft)	54.0	15.0			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			

[1] ground water level
[2] top of casing
[3] buyer's technical representative
[4] Spectral Gamma Logging System
[5] Neutron Moisture Logging System

Log Run	1	2 Repeat			
Log Speed (ft/min)	N/A	N/A			
Pre-Verification	AN208CAB	AN208CAB			
Start File	AN208000	AN208055			
Finish File	AN208054	AN208060			
Post-Verification	AN208CAA	AN208CAA			
Depth Return Error (in.)	N/A	0.0			
Comments	No fine gain adjustments made	No fine gain adjustments made			

NMLS Log Run Information:

Log Run	3	4 Repeat			
HEIS Number	1017799	1017800			
Date	3/2/11	3/2/11			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	0.0	10.0			
Finish Depth (ft)	18.25	15.0			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
Log Speed (ft/min)	N/A	N/A			
Pre-Verification	AH080CAB	AH080CAB			
Start File	AH080000	AH080074			
Finish File	AH080073	AH080094			
Post-Verification	AH080CAA	AH080CAA			
Depth Return Error (in.)	N/A	0.0			
Comments	None	None			

Logging Operation Notes:

SGLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the KUTh-118 field verifier. A centralizer was installed on the sonde.

NMLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the AmBe standard field verifier. A centralizer was installed on the sonde.

Analysis Notes:

Analyst:	C. Nelson	Date:	3/29/11	Reference:	HGLP-MAN-003, Rev. 0

Pre- and post-survey verification measurements met the acceptance criteria for the established systems.

A casing correction for 3/8-in. thick casing was applied during analysis. A water correction was applied from 19 ft to the total logged depth of the borehole.

SGLS spectra were processed in batch mode in APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated in an EXCEL template identified as AN20101221, using an efficiency function and corrections for casing and dead time as determined by annual calibrations.

During routine processing of gamma spectra, regions of interest are forced at specific energy levels associated with natural and manmade radionuclides that can be anticipated to be present. This processing approach sometimes

results in an isolated "detection" near the MDL[6] resulting in a false positive. Where these detections occur, the individual spectrum is scrutinized and a determination is made regarding the validity of the detection. If the detection is deemed not representative of a full energy peak, or if confirming peaks are not detected, it is removed from the data set. The integrity of the raw data files and the processed files are maintained should questions arise in the future regarding these determinations.

NMLS data are presented in counts per second because no calibration data exist for a 7 1/4-in. inner diameter casing.

The HGU[7] is an empirical unit of gamma activity proposed as a means to standardize gamma log response across multiple logging systems with different response characteristics. The HGU is defined in terms of measurements in the Hanford Borehole Calibration Facility, and the magnitude is selected such that 1 HGU is approximately equivalent to typical Hanford background activity, based on data from background samples as reported in *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12).

Results and Interpretations:

No manmade radionuclides were detected in this borehole. Although not detected, MDLs for Cs-137, U-235, and U-238 (Pa-234m) are plotted on the manmade radionuclides plot.

The neutron moisture log primarily responds to moisture present in the surrounding formation. In general, an increase in count rate reflects an increase in moisture content. Moisture content may increase in sediments of relatively high silt or clay content.

The KUT and moisture repeat plots indicate that the respective systems were working properly.

List of Log Plots:

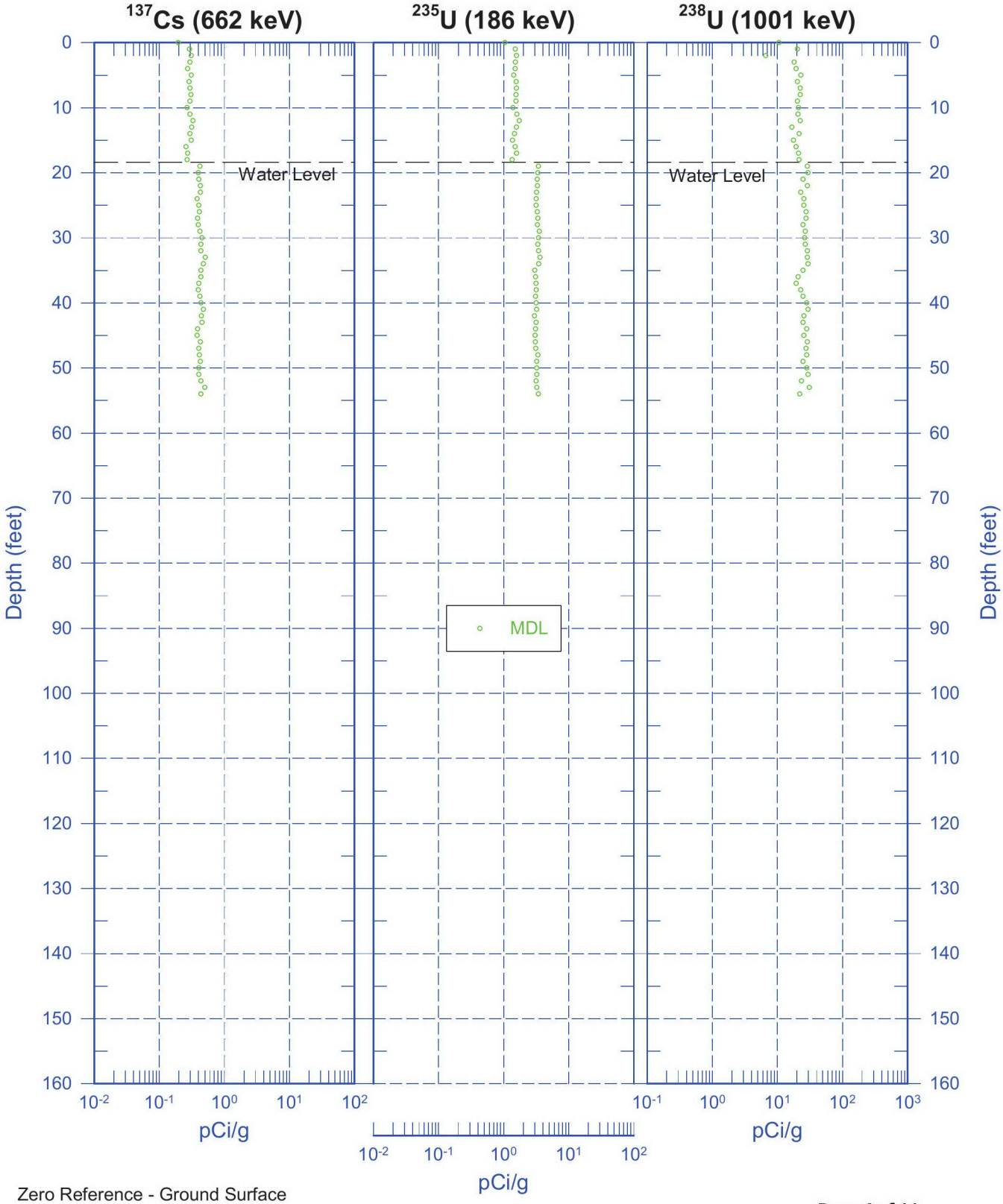
Depth Reference is ground surface

Manmade Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma & Dead Time
Total Gamma & Moisture
Total Gamma & Hanford Gamma Unit
Repeat Section of Natural Gamma Logs
Moisture Repeat Section

[6] minimum detection level
[7] Hanford Gamma Unit

Stoller Hanford Office

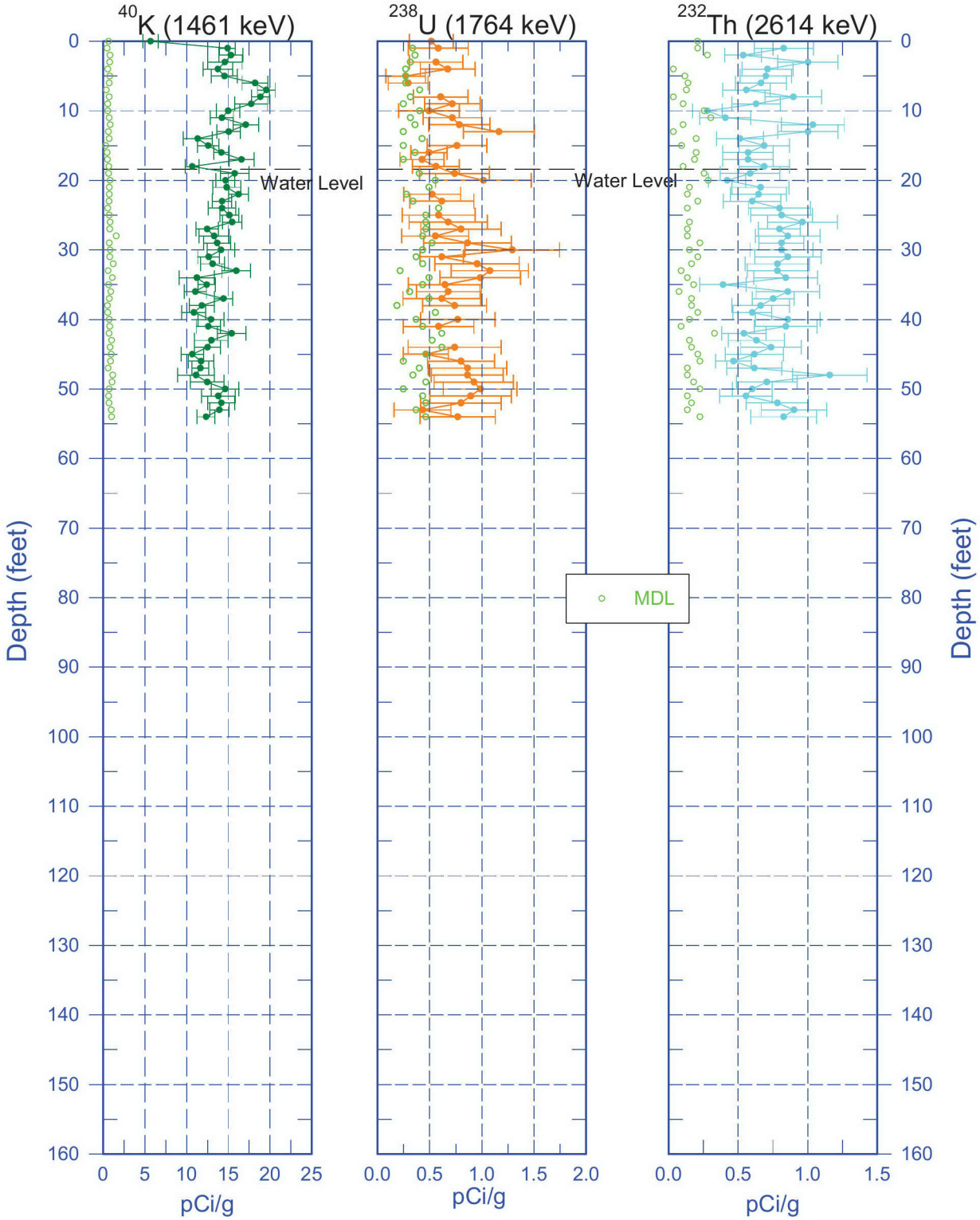
399-1-63 (C8028)
Manmade Radionuclides



Zero Reference - Ground Surface

Stoller
Hanford Office

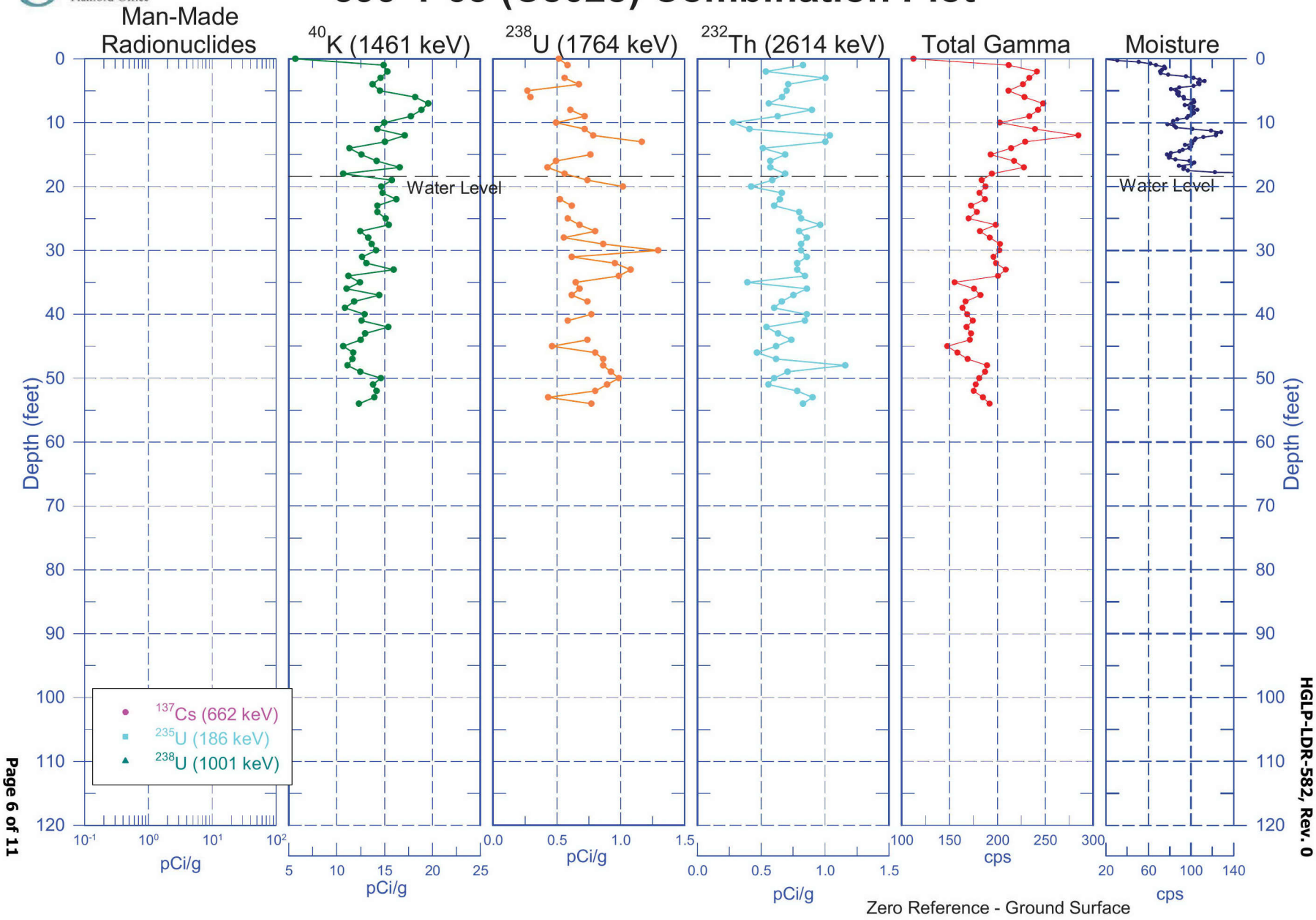
399-1-63 (C8028)
Natural Gamma Logs



Zero Reference - Ground Surface

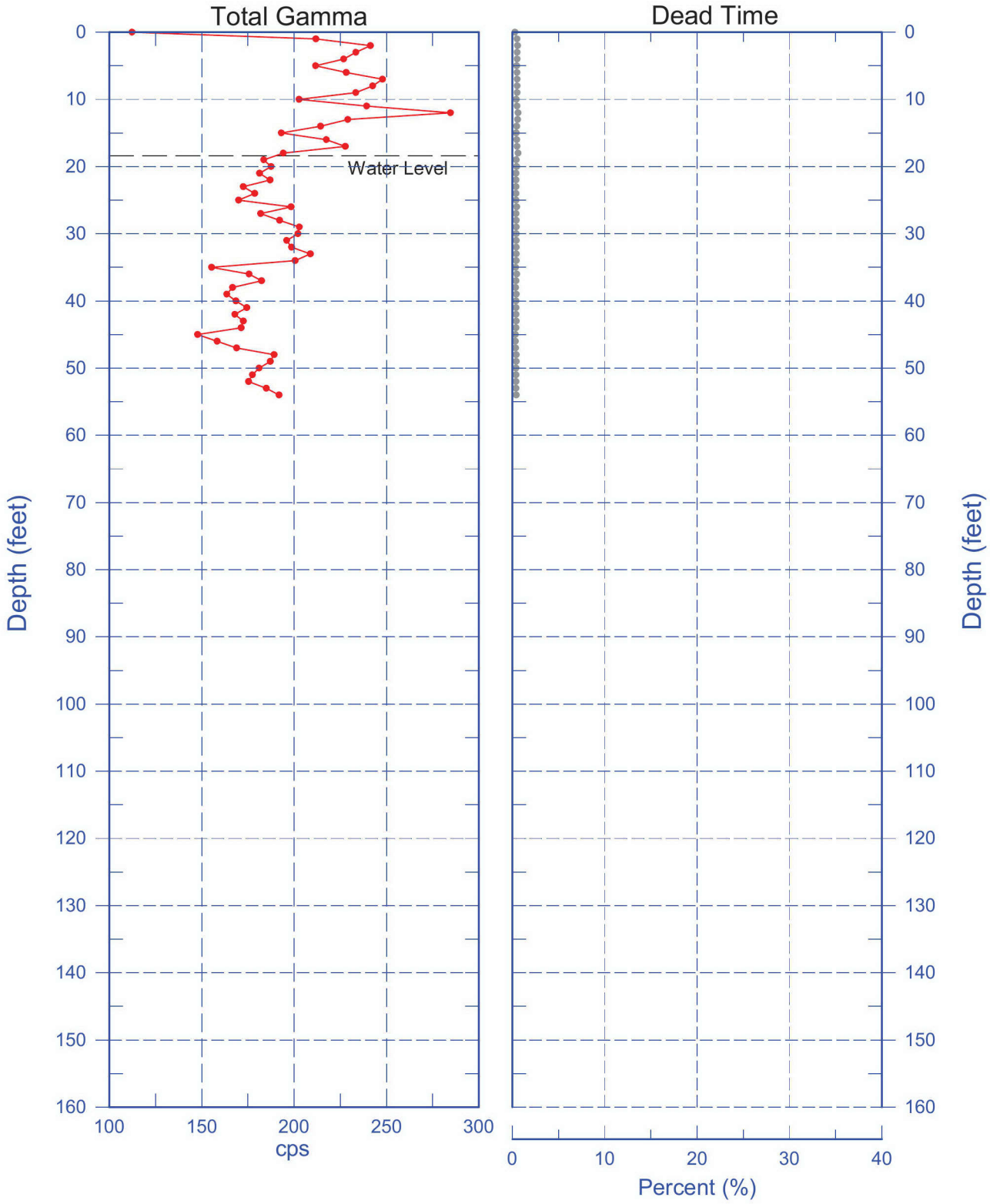
Stoller
Hanford Office

399-1-63 (C8028) Combination Plot



Stoller
Hanford Office

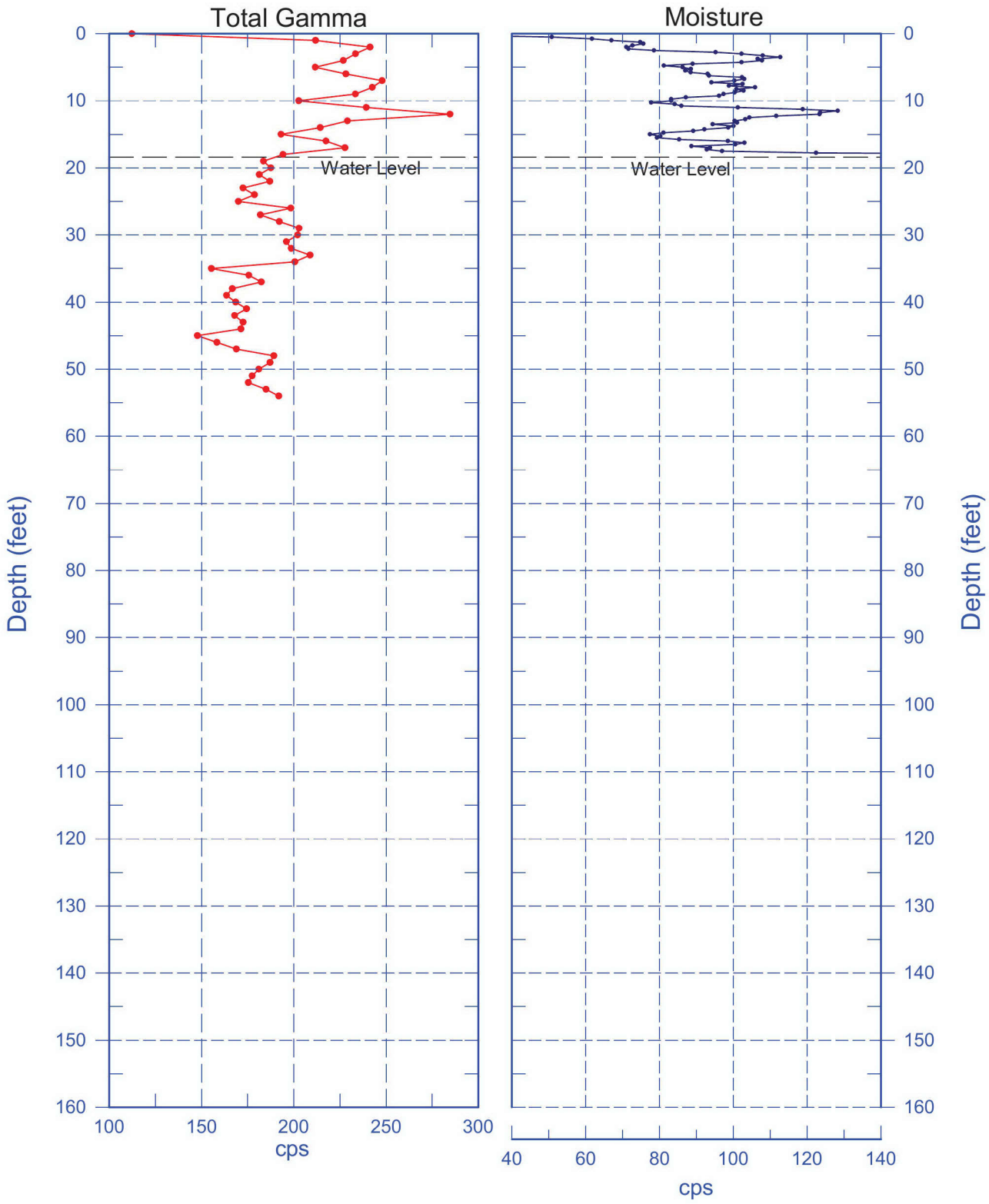
399-1-63 (C8028)
Total Gamma & Dead Time



Reference - Ground Surface

Stoller
Hanford Office

399-1-63 (C8028)
Total Gamma & Moisture

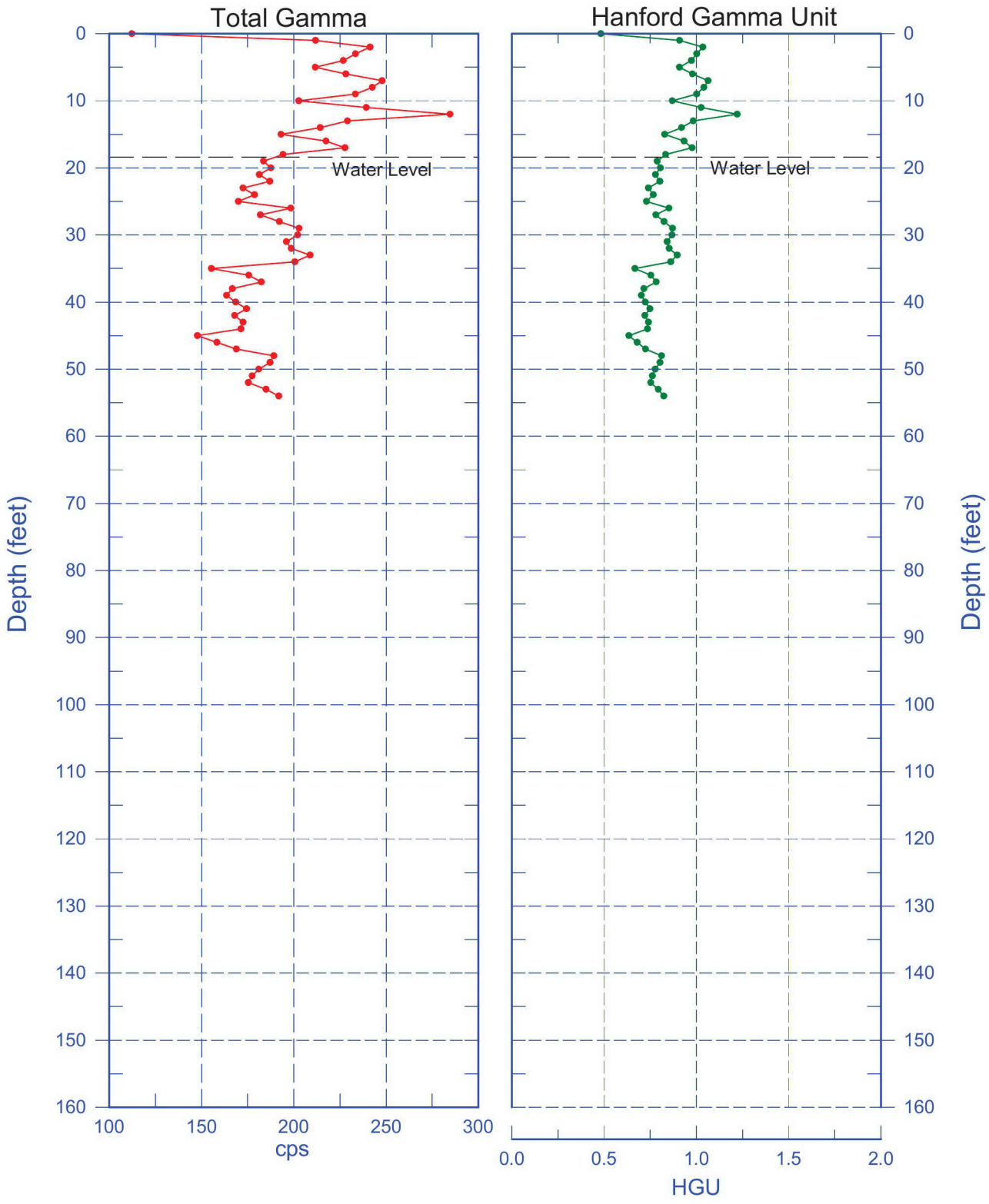


Reference - Ground Surface

Stoller Hanford Office

399-1-63 (C8028)

Total Gamma & Hanford Gamma Unit

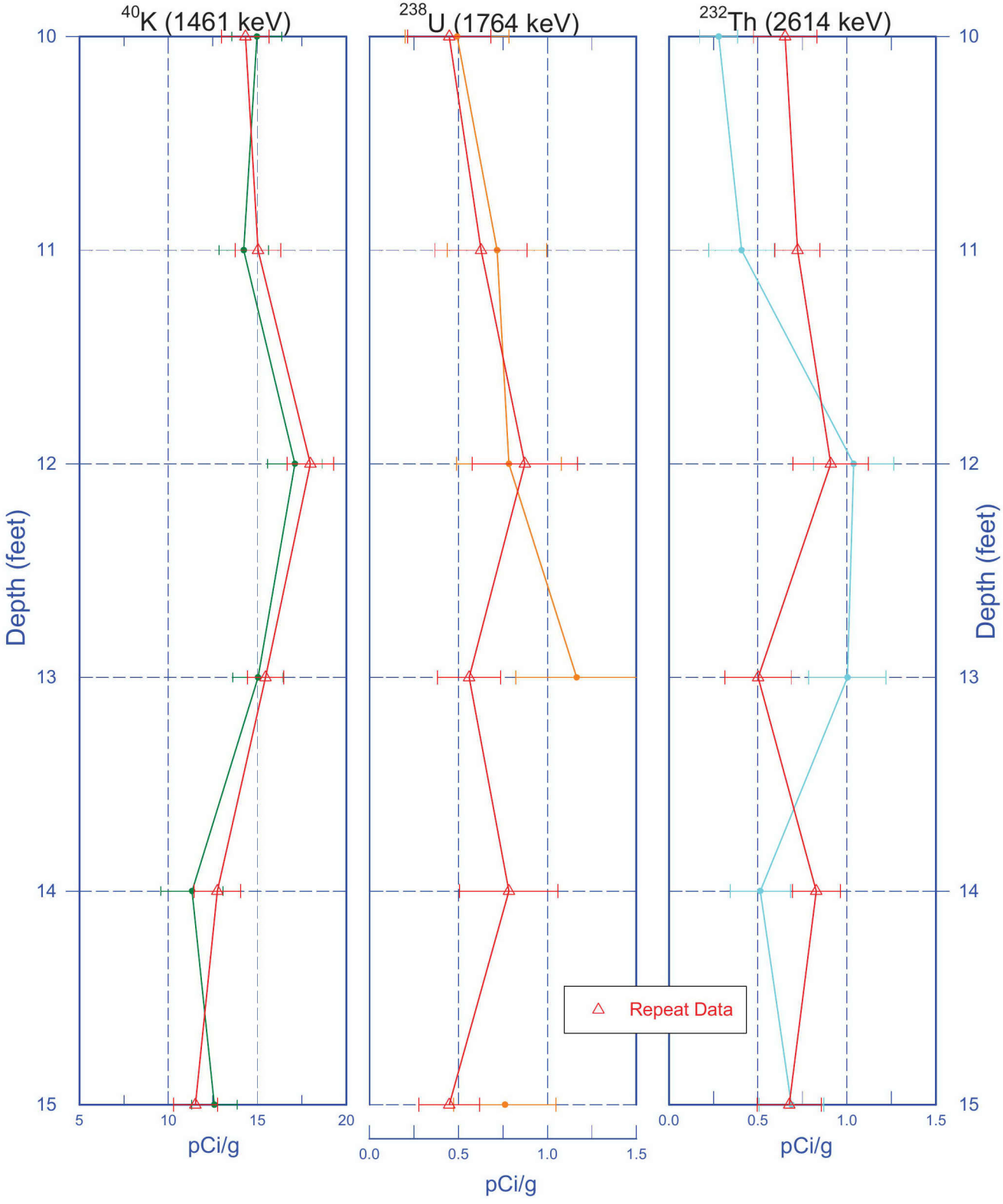


Reference - Ground Surface

Stoller Hanford Office

399-1-63 (C8028)

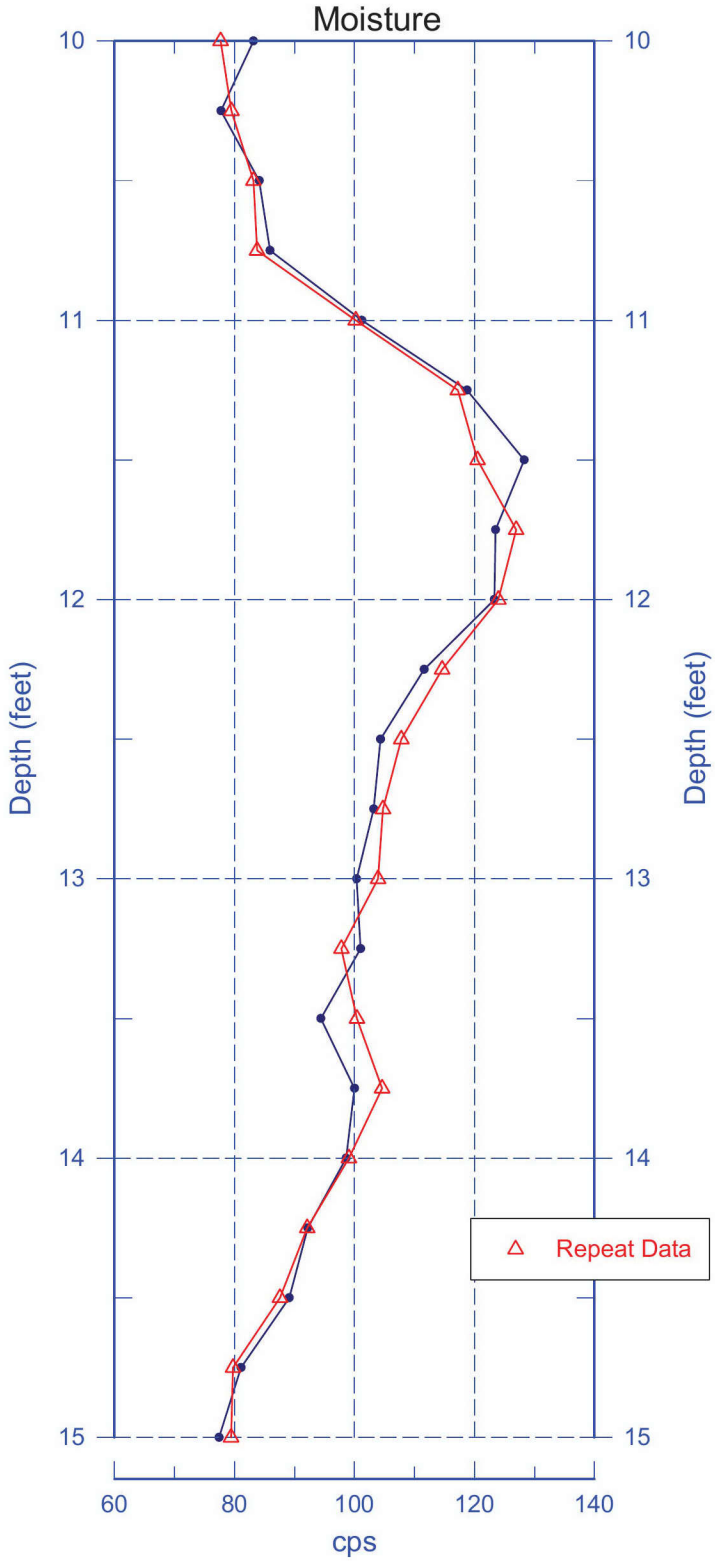
Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Stoller
Hanford Office

399-1-63 (C8028)
Moisture Repeat Section



Reference - Ground Surface

Stoller Hanford Office established 1959

HGLP-LDR-583, Rev. 0

399-1-64 (C8029)
Log Data Report

Borehole Information:

Log Date:	2011-03-04	**Filename:**	C8029_HG-NM_2011-03-04	**Site:**	300-FF-5
Coordinates (WA St Plane)		**GWL[1] (ft) :**	30.3	**GWL Date:**	3/4/11
North (m)	**East (m)**	**Drill Date**	**TOC[2] Elevation**	**Total Depth (ft)**	**Type**
Unknown	Unknown	3/4/11	Unknown	47.5	Sonic

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded Steel	1.9	8	7 1/4	3/8	1.9	48.1

Borehole Notes:

The buyer's technical representative provided the depth of the borehole and depth of casing. The logging engineer measured casing diameters (rounded to the nearest 1/16-in.) and depth to water.

Zero reference is ground surface.

Logging Equipment Information:

Logging System:	Gamma 1N		**Type:** **Serial No.:**	60% HPGe SGLS[3] 45-TP22010A
Effective Calibration Date:	12/21/10	**Calibration Reference:**	HGLP-CC-066, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Logging System:	Gamma 1H		**Type:** **Serial No.:**	NMLS[4] H310700352
Effective Calibration Date:	5/17/10	**Calibration Reference:**	HGLP-CC-058, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

SGLS Log Run Information:

Log Run	1	2 Repeat			
HEIS Number	1017801	1017802			
Date	3/4/11	3/4/11			
Logging Engineer	Pearson	Pearson			
Start Depth (ft)	46.0	7.0			
Finish Depth (ft)	0.0	2.0			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
Log Speed (ft/min)	N/A	N/A			
Pre-Verification	AN210CAB	AN210CAB			

[1] ground water level
[2] top of casing
[3] Spectral Gamma Logging System
[4] Neutron Moisture Logging System

Log Run	1	2 Repeat			
Start File	AN210000	AN210047			
Finish File	AN210046	AN210052			
Post-Verification	AN210CAA	AN210CAA			
Depth Return Error (in.)	0.0	0.0			
Comments	No fine gain adjustment made	No fine gain adjustment made			

NMLS Log Run Information:

Log Run	3	4 Repeat			
HEIS Number	1017803	1017804			
Date	3/4/11	3/4/11			
Logging Engineer	Pearson	Pearson			
Start Depth (ft)	0.0	2.0			
Finish Depth (ft)	30.0	5.0			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
Log Speed (ft/min)	N/A	N/A			
Pre-Verification	AH082CAB	AH082CAB			
Start File	AH082000	AH082121			
Finish File	AH082120	AH082133			
Post-Verification	AH082CAA	AH082CAA			
Depth Return Error (in.)	N/A	0.0			
Comments	None	None			

Logging Operation Notes:

SGLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the KUTh-118 field verifier. A centralizer was installed on the sonde.

NMLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the AmBe standard field verifier. A centralizer was installed on the sonde.

Analysis Notes:

Analyst:	C. Nelson	Date:	3/31/11	Reference:	HGLP-MAN-003, Rev. 0

Pre- and post-survey verification measurements met the acceptance criteria for the established systems.

A casing correction for 3/8-in. thick casing was applied during analysis. A water correction was applied from 31 ft to the total logged depth of the borehole.

SGLS spectra were processed in batch mode in APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated in an EXCEL template identified as AN20101221, using an efficiency function and corrections for casing and dead time as determined by annual calibrations.

During routine processing of gamma spectra, regions of interest are forced at specific energy levels associated with natural and manmade radionuclides that can be anticipated to be present. This processing approach sometimes results in an isolated "detection" near the MDL[5] resulting in a false positive. Where these detections occur, the

[5] minimum detection level

individual spectrum is scrutinized and a determination is made regarding the validity of the detection. If the detection is deemed not representative of a full energy peak, or if confirming peaks are not detected, it is removed from the data set. The integrity of the raw data files and the processed files are maintained should questions arise in the future regarding these determinations.

NMLS data are presented in counts per second because no calibration data exist for a 7 1/4-in. inner diameter casing.

The HGU[6] is an empirical unit of gamma activity proposed as a means to standardize gamma log response across multiple logging systems with different response characteristics. The HGU is defined in terms of measurements in the Hanford Borehole Calibration Facility, and the magnitude is selected such that 1 HGU is approximately equivalent to typical Hanford background activity, based on data from background samples as reported in *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12).

Results and Interpretations:

No manmade radionuclides were detected in this borehole. Although not detected, MDLs for Cs-137, U-235, and U-238 (Pa-234m) are plotted on the manmade radionuclides plot.

The neutron moisture log primarily responds to moisture present in the surrounding formation. In general, an increase in count rate reflects an increase in moisture content. Moisture content may increase in sediments of relatively high silt or clay content.

The KUT and moisture repeat plots indicate that the respective systems were working properly.

List of Log Plots:

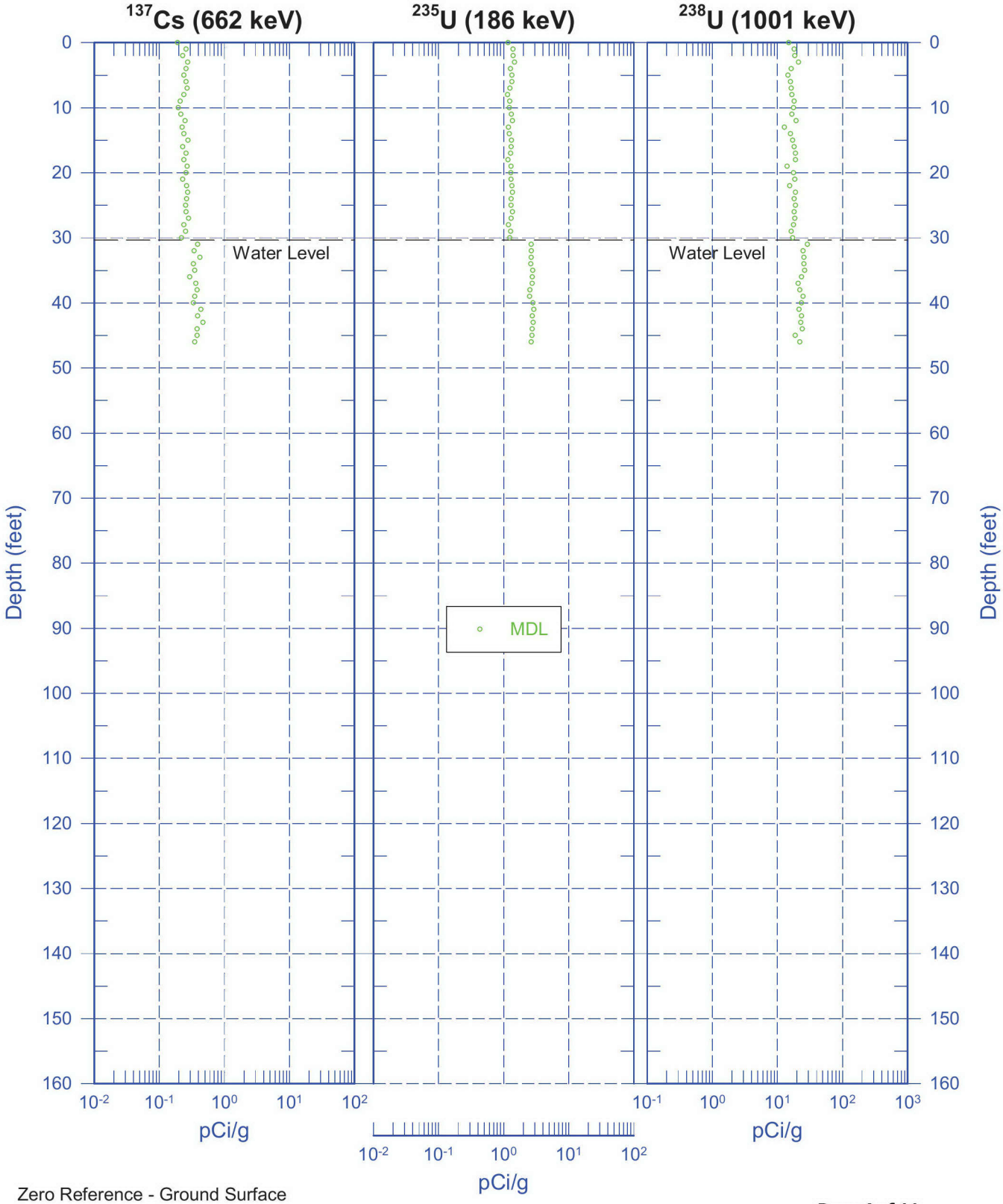
Depth Reference is ground surface

Manmade Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma & Dead Time
Total Gamma & Moisture
Total Gamma & Hanford Gamma Unit
Repeat Section of Natural Gamma Logs
Moisture Repeat Section

[6] Hanford Gamma Unit

Stoller Hanford Office

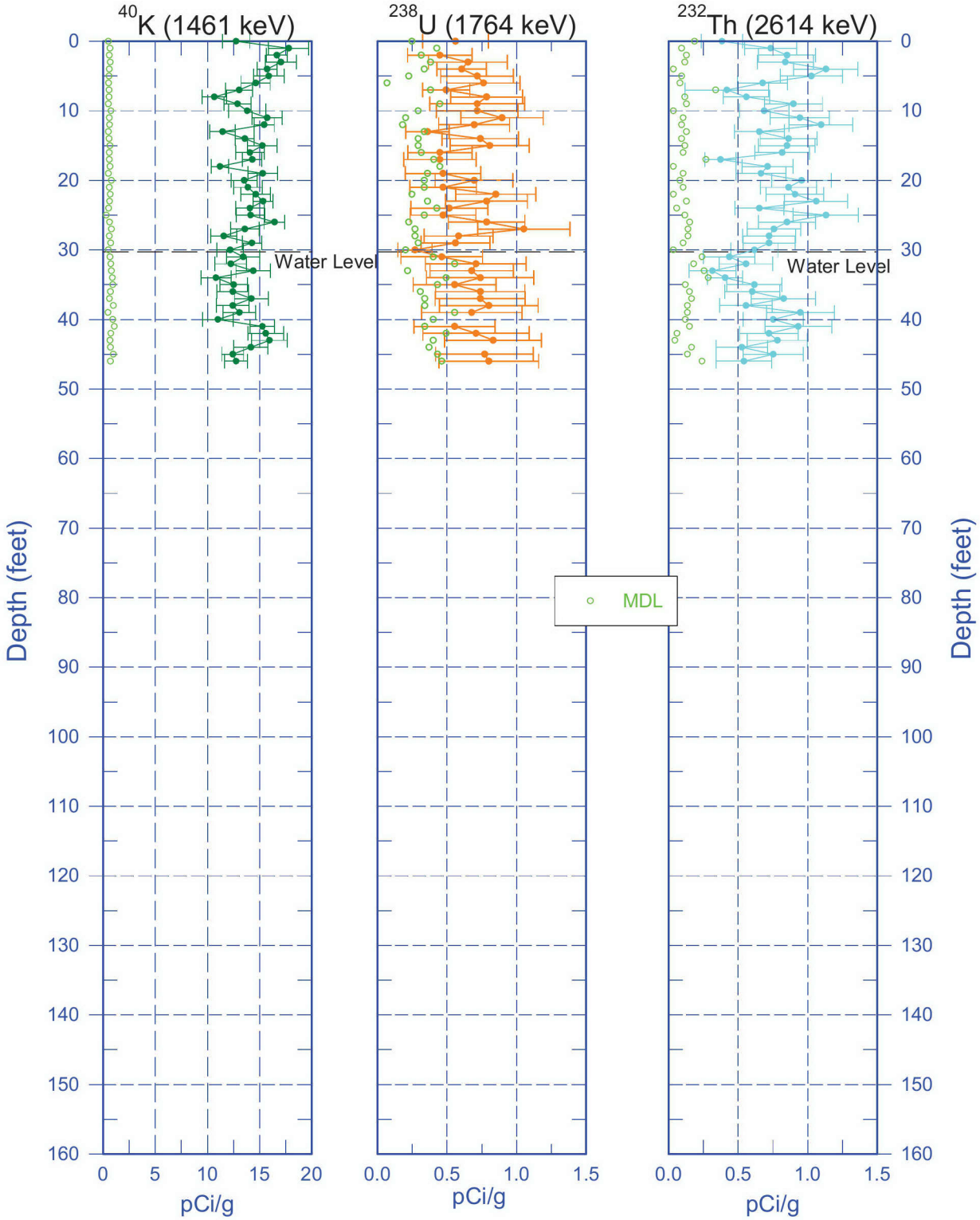
399-1-64 (C8029)
Manmade Radionuclides



Zero Reference - Ground Surface

Stoller
Hanford Office

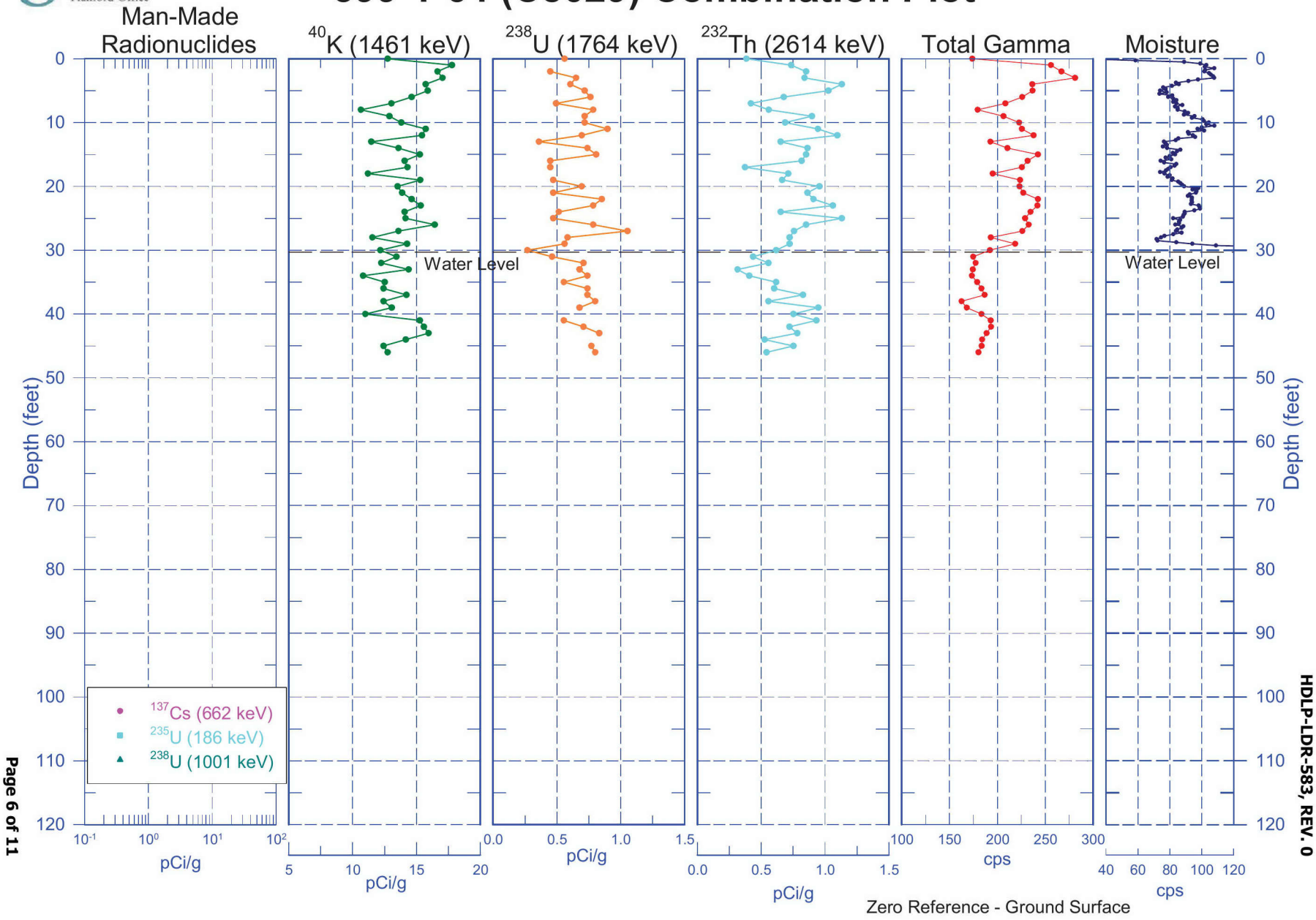
399-1-64 (C8029)
Natural Gamma Logs



Zero Reference - Ground Surface

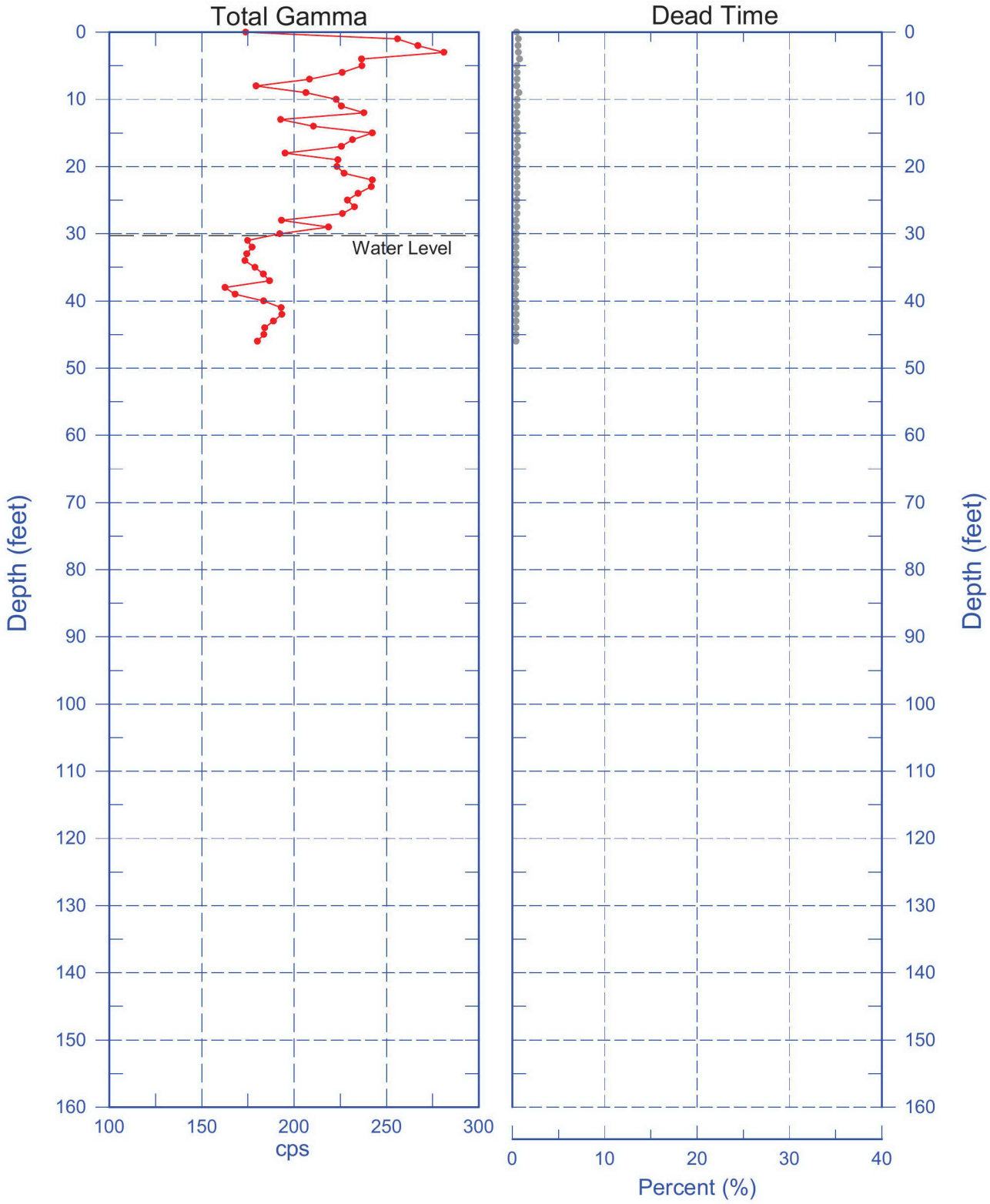
Stoller
Hanford Office

399-1-64 (C8029) Combination Plot



Stoller
Hanford Office

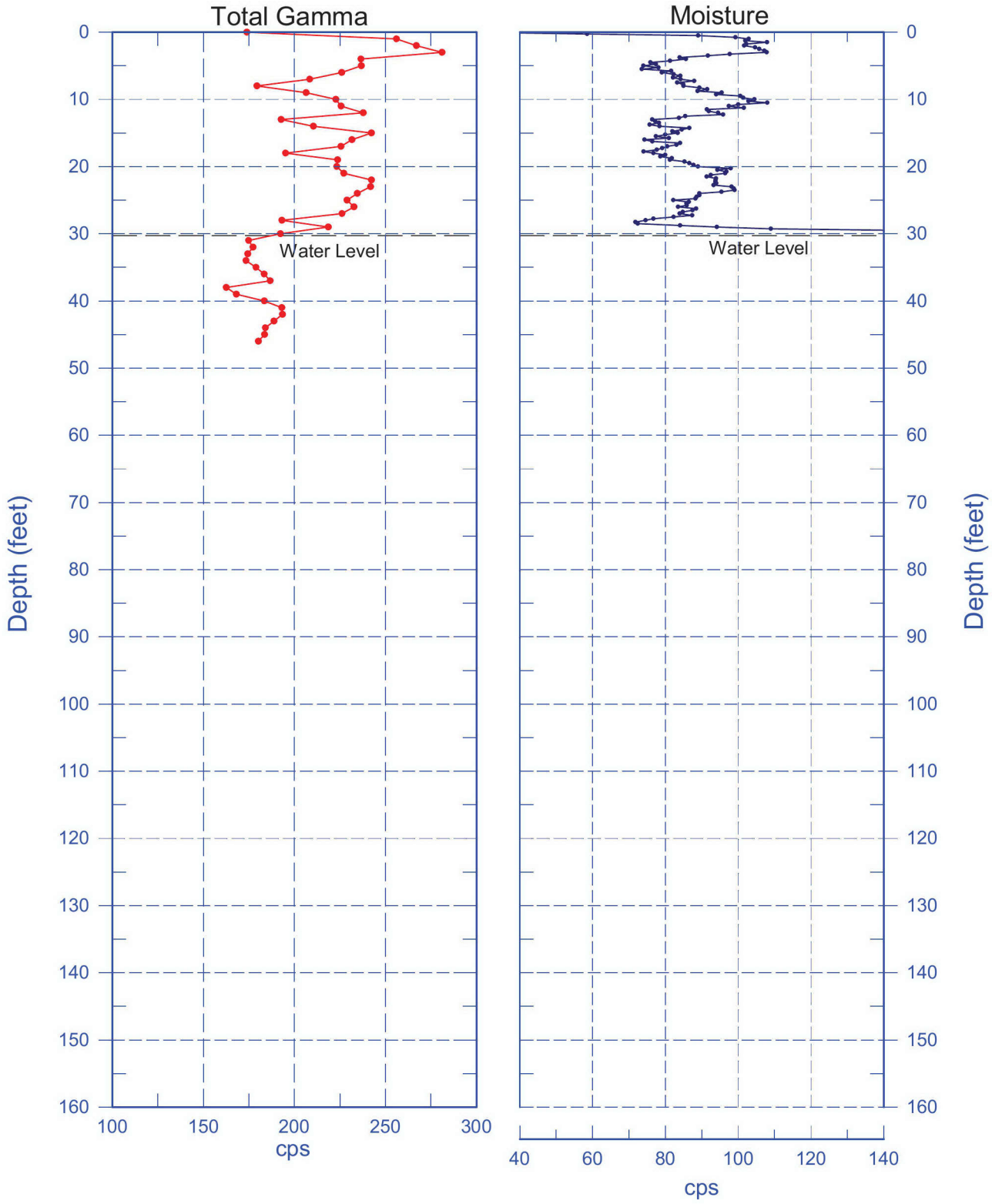
399-1-64 (C8029)
Total Gamma & Dead Time



Reference - Ground Surface

Stoller Hanford Office

399-1-64 (C8029)
Total Gamma & Moisture

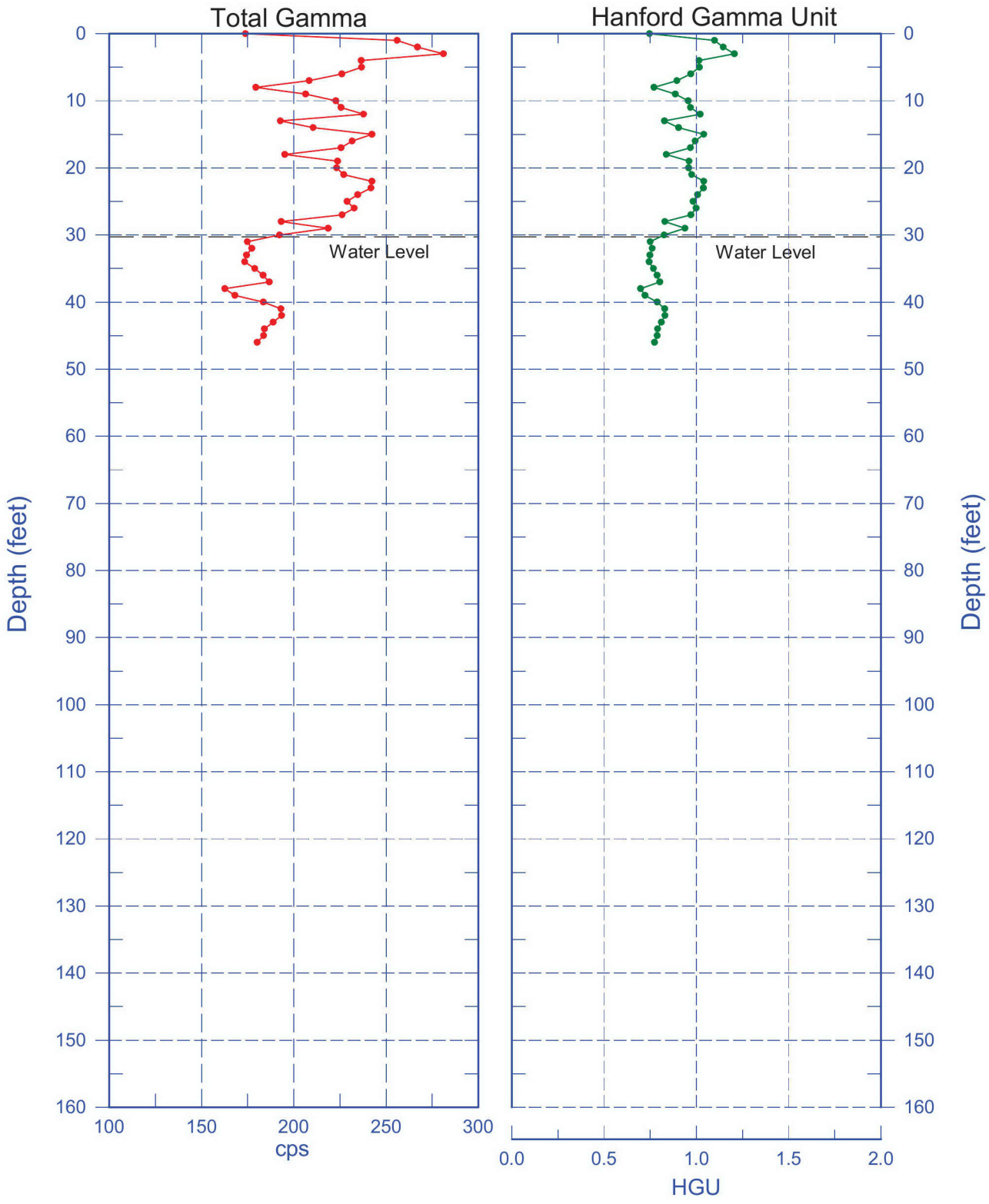


Reference - Ground Surface

Stoller Hanford Office

399-1-64 (C8029)

Total Gamma & Hanford Gamma Unit

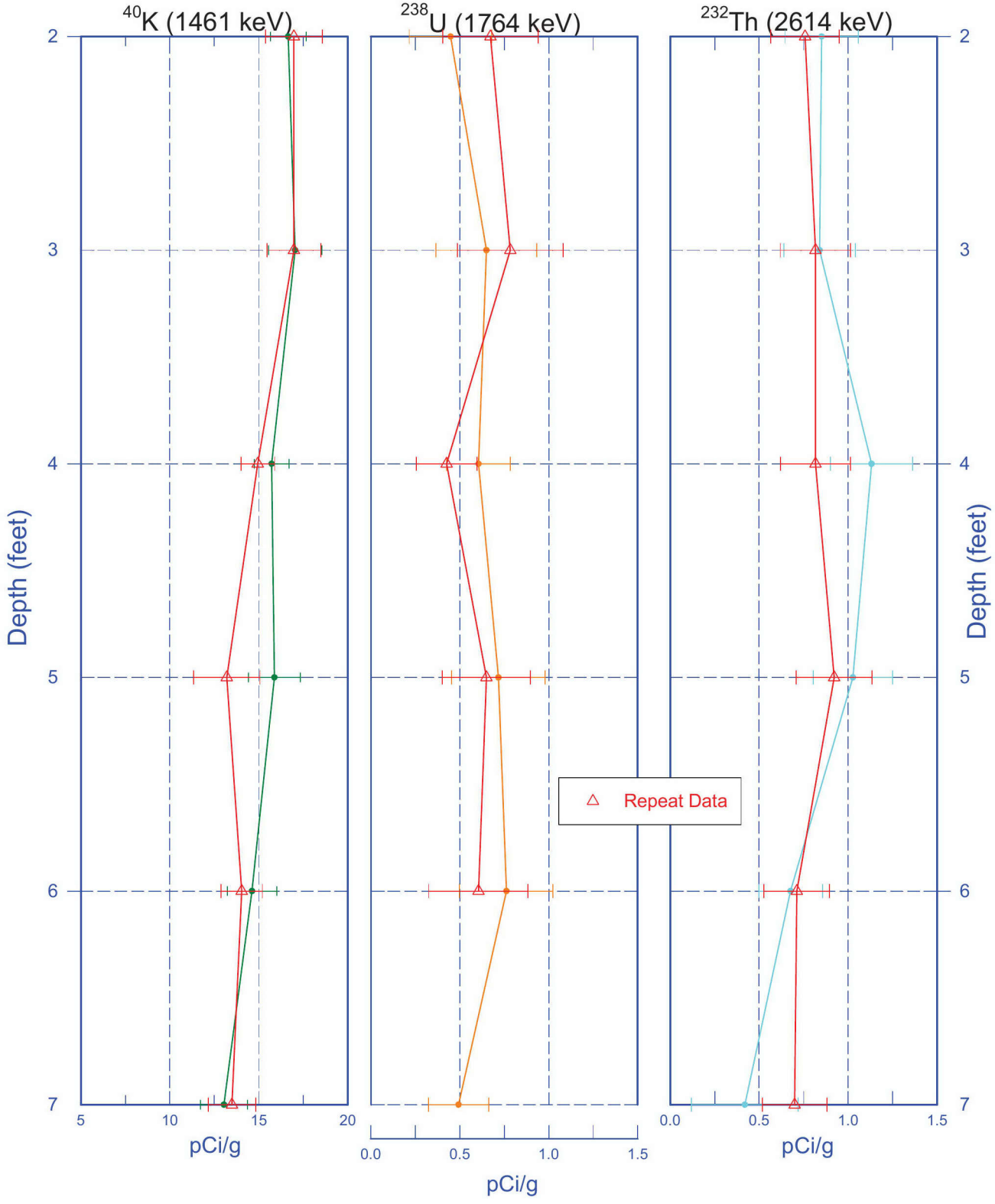


Reference - Ground Surface

Stoller Hanford Office

399-1-64 (C8029)

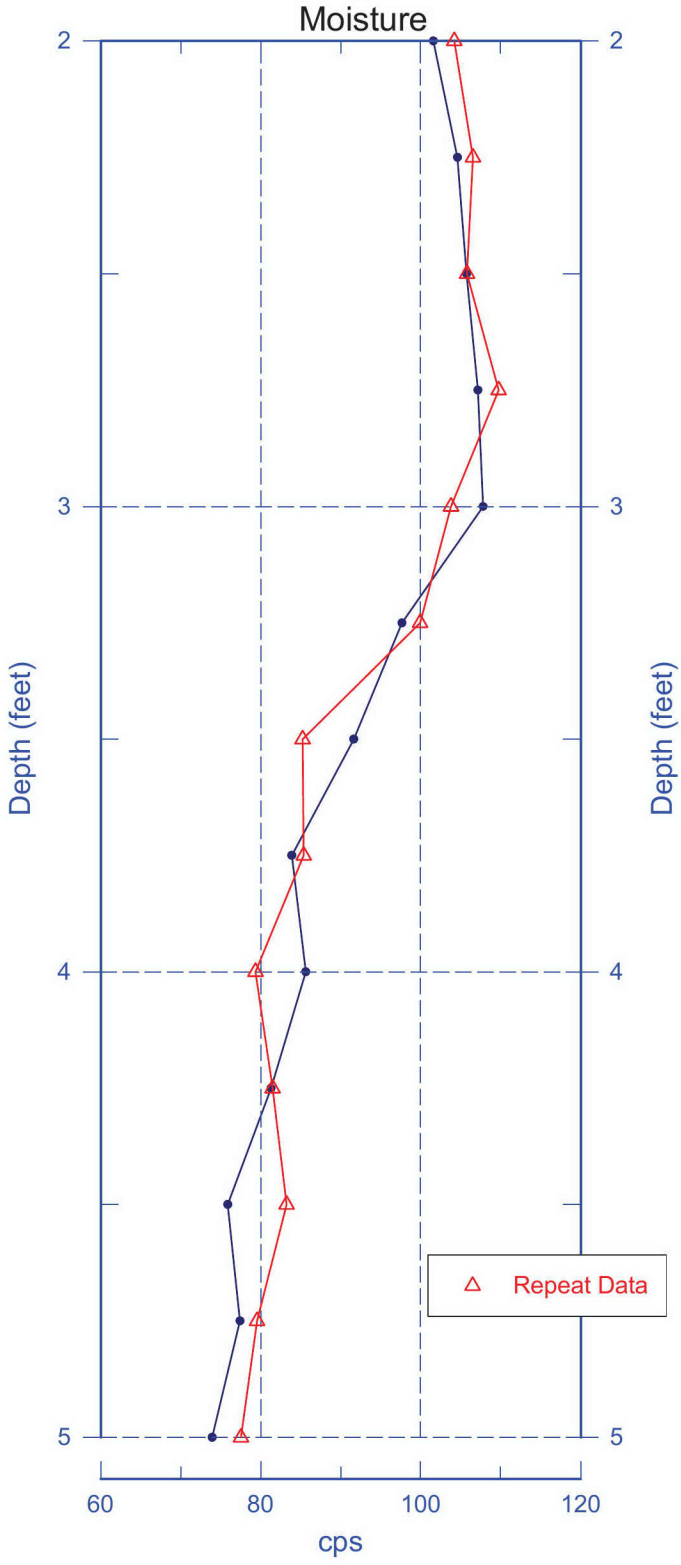
Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Stoller
Hanford Office

399-1-64 (C8029)
Moisture Repeat Section



Reference - Ground Surface

Stoller Hanford Office established 1959

HGLP-LDR-584, Rev. 0

399-3-38 (C8030)
Log Data Report

Borehole Information:

Log Date:	2011-03-08	Filename:	C8030_HG-NM_2011-03-08	Site:	300-FF-5
Coordinates (WA St Plane)		GWL[1] (ft):	41.9	GWL Date:	3/8/11
North (m)	East (m)	Drill Date	TOC[2] Elevation	Total Depth (ft)	Type
Unknown	Unknown	3/8/11	Unknown	56	Sonic

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded Steel	3.8	8	7 1/4	3/8	3.8	56

Borehole Notes:

The buyer's technical representative provided the depth of the borehole, depth of casing and depth to water. The logging engineer measured casing diameters (rounded to the nearest 1/16 in.).

Zero reference is ground surface.

Logging Equipment Information:

Logging System:	Gamma 1N		Type: Serial No.:	60 % HPGe SGLS[3] 45-TP22010A
Effective Calibration Date:	12/21/10	Calibration Reference:	HGLP-CC-066, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Logging System:	Gamma 1H		Type: Serial No.:	NMLS[4] H310700352
Effective Calibration Date:	5/17/10	Calibration Reference:	HGLP-CC-058, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

SGLS Log Run Information:

Log Run	1	2 Repeat			
HEIS Number	1017805	1017806			
Date	3/8/11	3/8/11			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	0.0	8.0			
Finish Depth (ft)	56.0	13.0			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
Log Speed (ft/min)	N/A	N/A			
Pre-Verification	AN212CAB	AN212CAB			

[1] ground water level
[2] top of casing
[3] Spectral Gamma Logging System
[4] Neutron Moisture Logging System

Log Run	1	2 Repeat			
Start File	AN212000	AN212057			
Finish File	AN212056	AN212062			
Post-Verification	AN212CAA	AN212CAA			
Depth Return Error (in.)	N/A	1/2 low			
Comments	No fine gain adjustment made	No fine gain adjustment made			

NMLS Log Run Information:

Log Run	3	4 Repeat			
HEIS Number	1017807	1017808			
Date	3/8/11	3/8/11			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	0.0	8.0			
Finish Depth (ft)	41.5	13.0			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
Log Speed (ft/min)	N/A	N/A			
Pre-Verification	AH084CAB	AH084CAB			
Start File	AH084000	AH084167			
Finish File	AH084166	AH084187			
Post-Verification	AH084CAA	AH084CAA			
Depth Return Error (in.)	N/A	1 high			
Comments	None	None			

Logging Operation Notes:

SGLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the KUTh-118 field verifier. A centralizer was installed on the sonde.

NMLS data were collected using Gamma 1, HO 68B-3574. Pre- and post-survey verification measurements were acquired in the AmBe standard field verifier. A centralizer was installed on the sonde.

Analysis Notes:

Analyst:	C. Nelson	Date:	4/4/11	Reference:	HGLP-MAN-003 Rev. 0

Pre- and post-survey verification measurements met the acceptance criteria for the established systems.

A casing correction for 3/8-in. thick casing was applied during analysis. A water correction was applied from 42 ft to the total logged depth of the borehole.

SGLS spectra were processed in batch mode in APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated in an EXCEL template identified as AN20101221, using an efficiency function and corrections for casing and dead time as determined by annual calibrations.

During routine processing of gamma spectra, regions of interest are forced at specific energy levels associated with natural and manmade radionuclides that can be anticipated to be present. This processing approach sometimes results in an isolated "detection" near the MDL[5] resulting in a false positive. Where these detections occur, the

[5] minimum detection level

individual spectrum is scrutinized and a determination is made regarding the validity of the detection. If the detection is deemed not representative of a full energy peak, or if confirming peaks are not detected, it is removed from the data set. The integrity of the raw data files and the processed files are maintained should questions arise in the future regarding these determinations.

NMLS data are presented in counts per second because no calibration data exists for a 7 1/4-in. inner diameter casing.

The HGU[6] is an empirical unit of gamma activity proposed as a means to standardize gamma log response across multiple logging systems with different response characteristics. The HGU is defined in terms of measurements in the Hanford Borehole Calibration Facility, and the magnitude is selected such that 1 HGU is approximately equivalent to typical Hanford background activity, based on data from background samples as reported in *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12).

Results and Interpretations:

No manmade radionuclides were detected in this borehole. Although not detected, MDLs for Cs-137, U-235, and U-238 (Pa-234m) are plotted on the manmade radionuclides plot.

The neutron moisture log primarily responds to moisture present in the surrounding formation. In general, an increase in count rate reflects an increase in moisture content. Moisture content may increase in sediments of relatively high silt or clay content.

The KUT and moisture repeat plots indicate that the respective systems were working properly.

List of Log Plots:

Depth Reference is ground surface

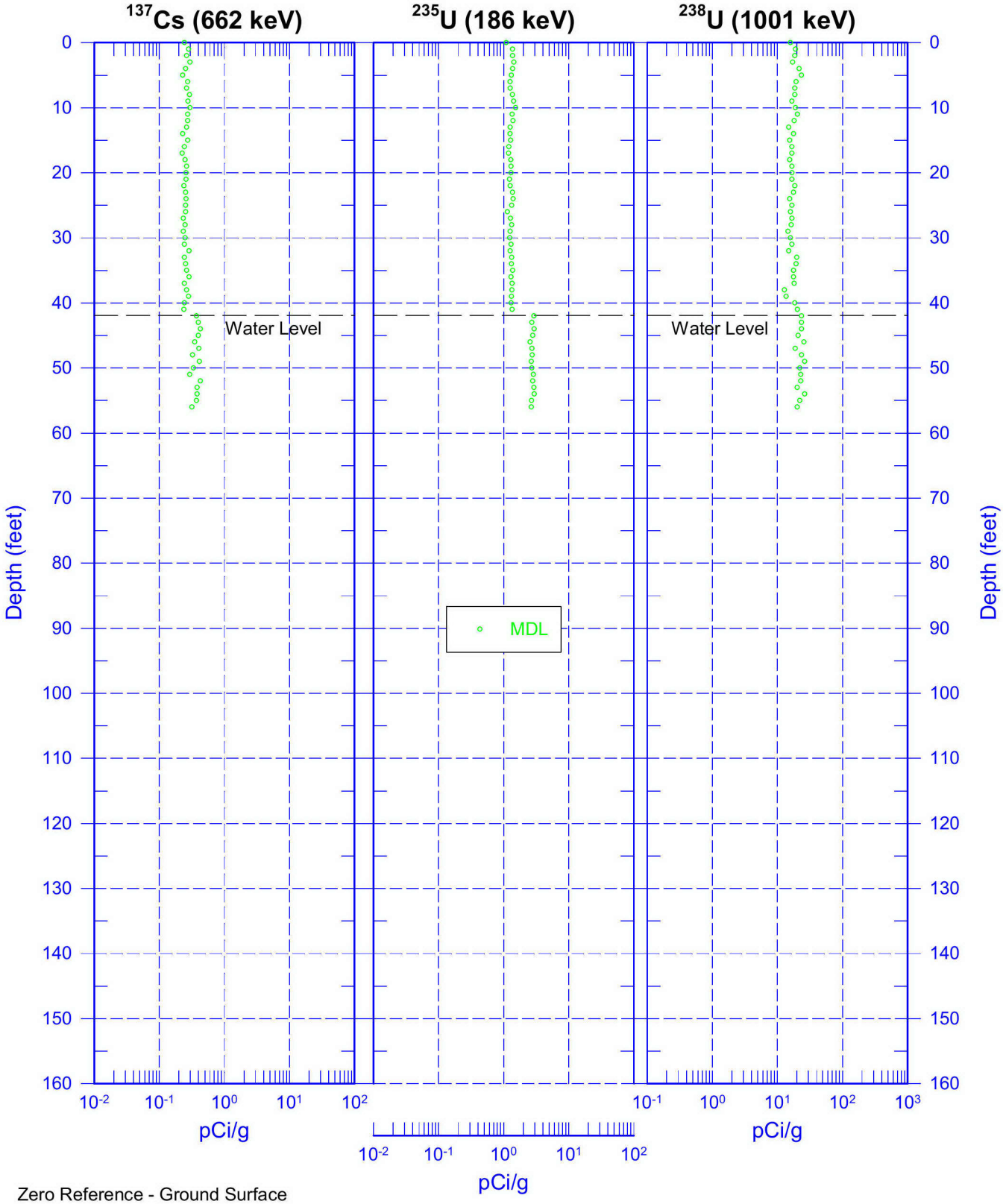
Manmade Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma & Dead Time
Total Gamma & Moisture
Total Gamma & Hanford Gamma Unit
Repeat Section of Natural Gamma Logs
Moisture Repeat Section

[6] Hanford Gamma Unit

HGLP-LDR-584, Rev. 0

Stoller Hanford Office

399-3-38 (C8030)
Manmade Radionuclides

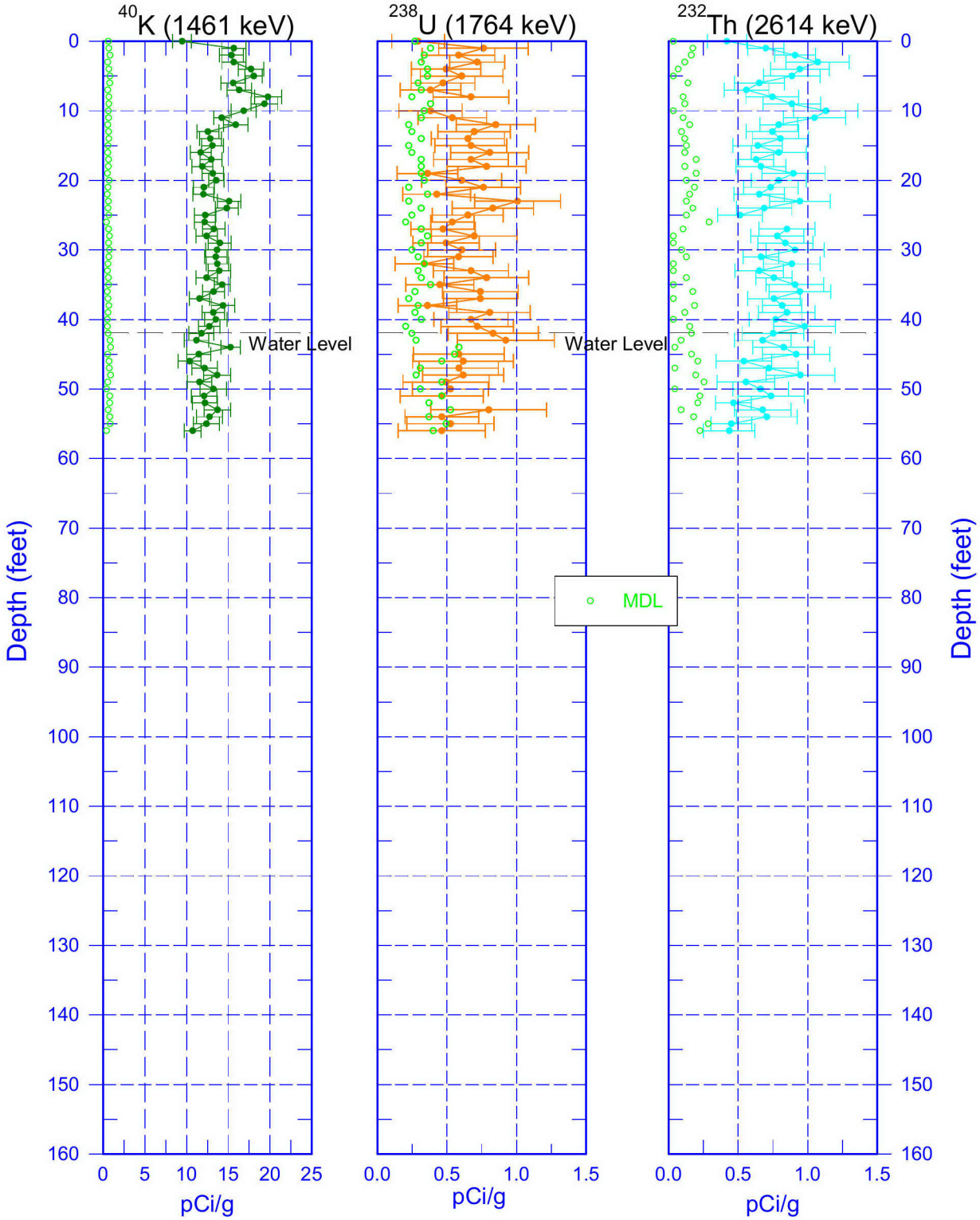


Zero Reference - Ground Surface

Stoller Hanford Office

HGLP-LDR-584, Rev. 0

399-3-38 (C8030)
Natural Gamma Logs

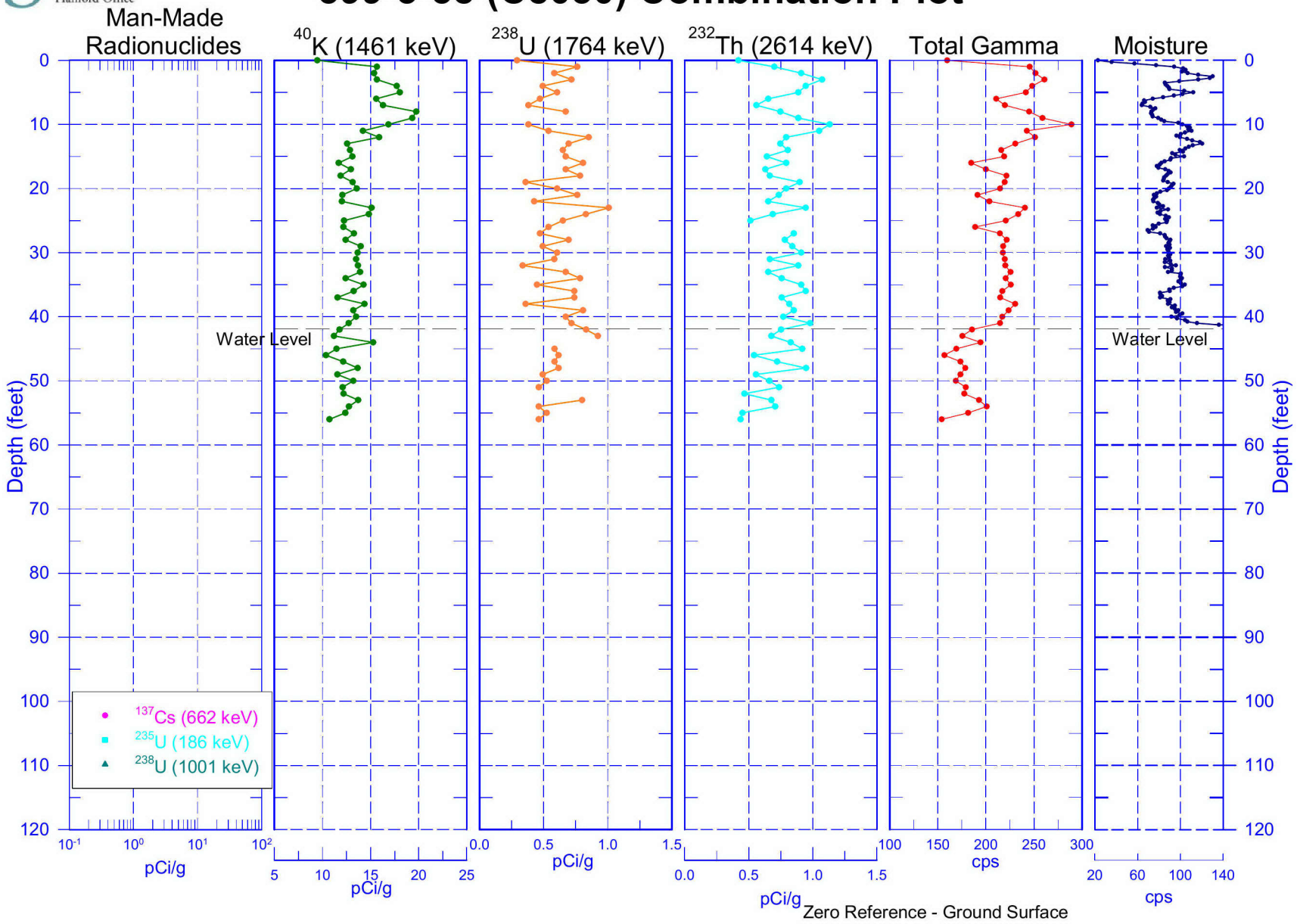


Zero Reference - Ground Surface

Stoller
Hanford Office

HGLP-LDR-584, Rev. 0

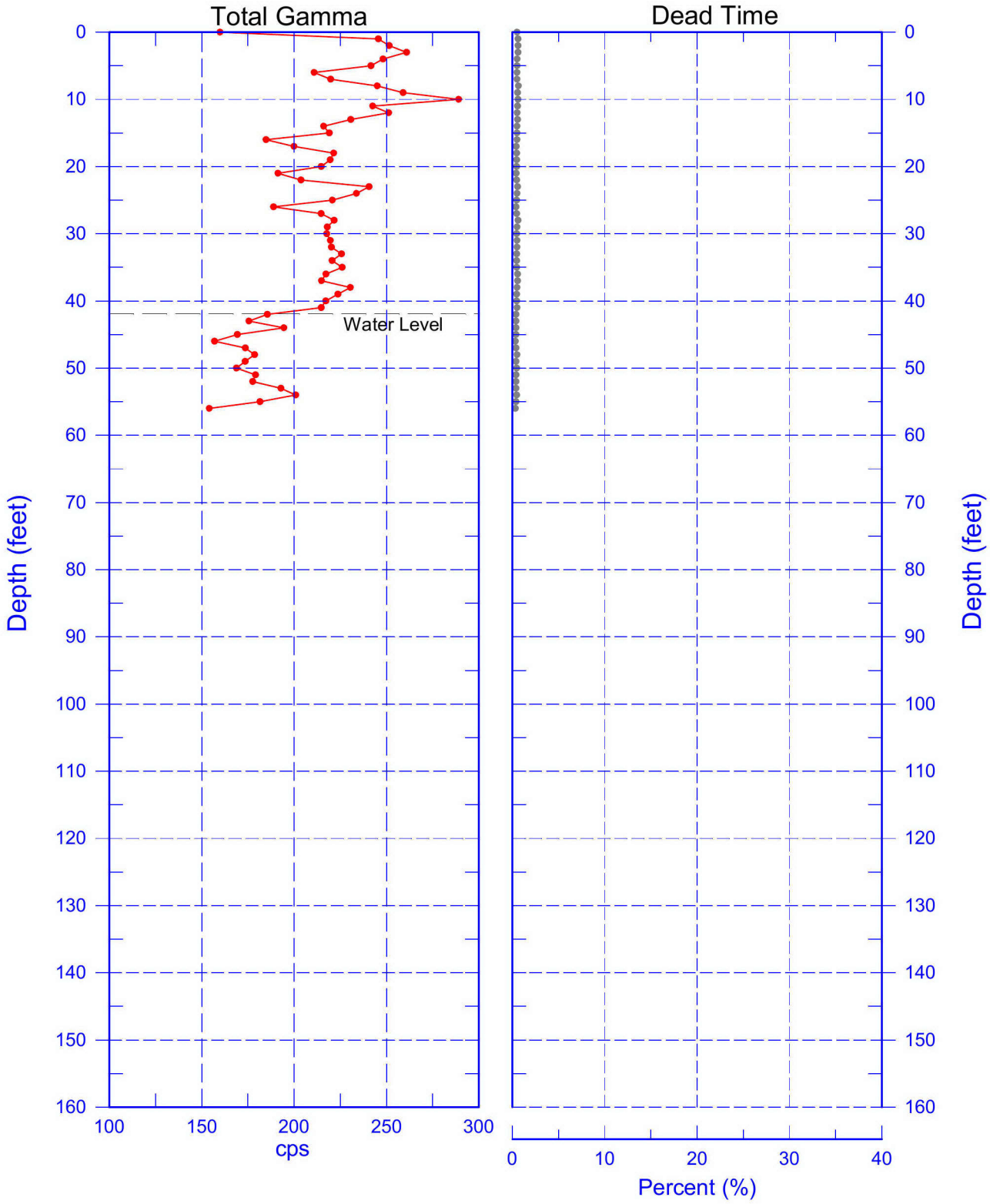
399-3-38 (C8030) Combination Plot



HGLP-LDR-584, Rev. 0

Stoller Hanford Office

399-3-38 (C8030)
Total Gamma & Dead Time

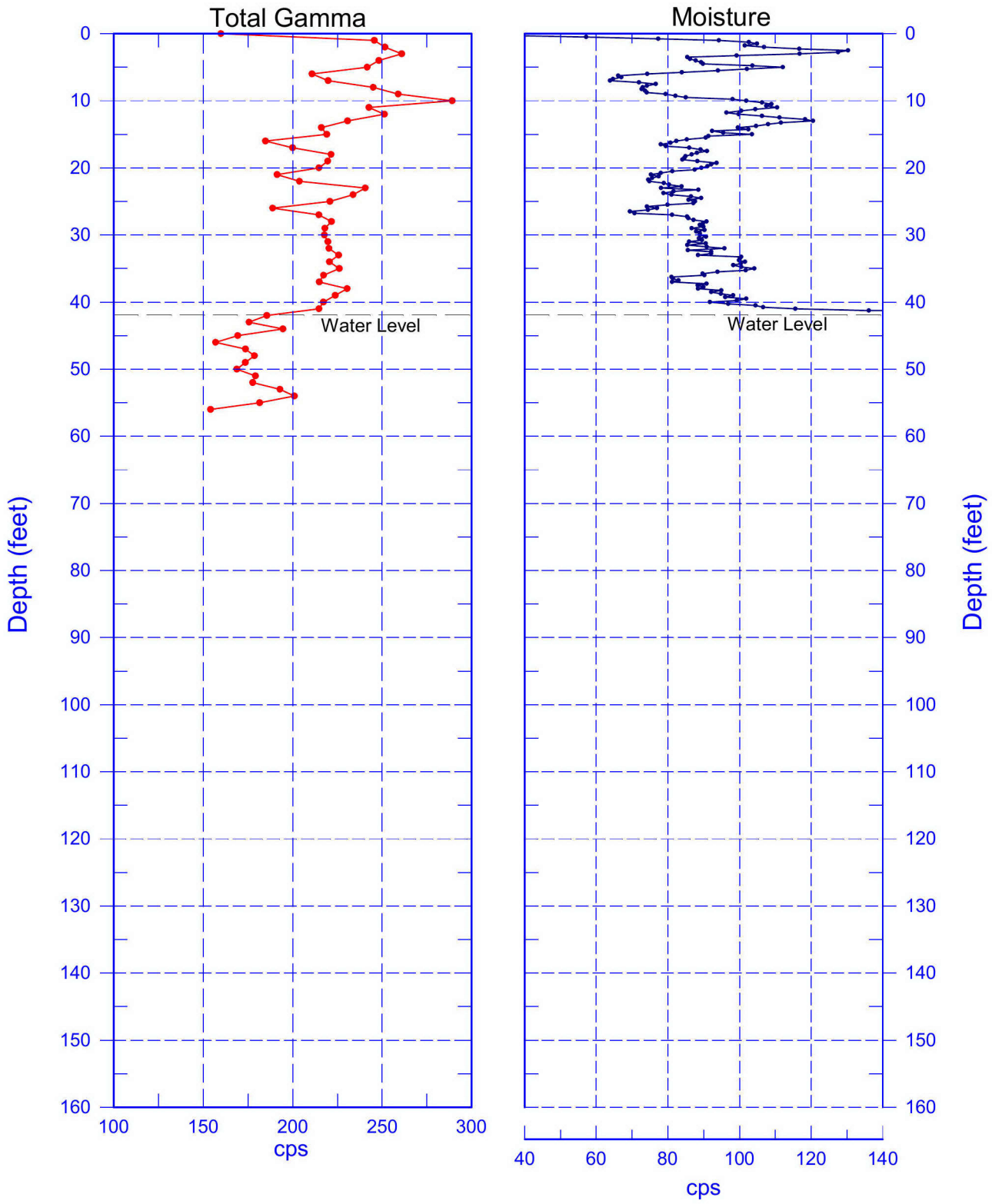


Reference - Ground Surface

HGLP-LDR-584, Rev. 0

Stoller Hanford Office

399-3-38 (C8030)
Total Gamma & Moisture



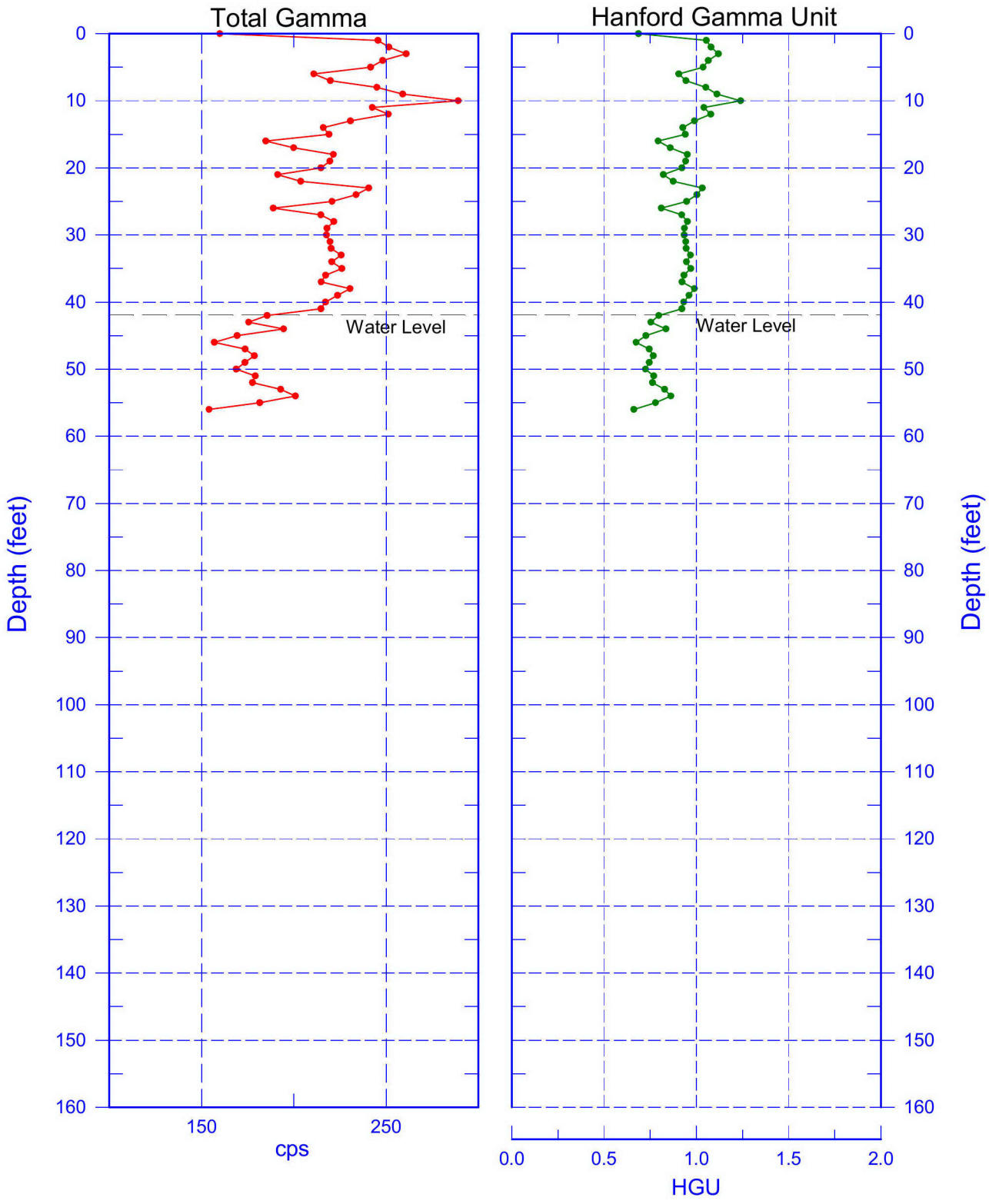
Reference - Ground Surface

HGLP-LDR-584, Rev. 0

Stoller Hanford Office

399-3-38 (C8030)

Total Gamma & Hanford Gamma Unit



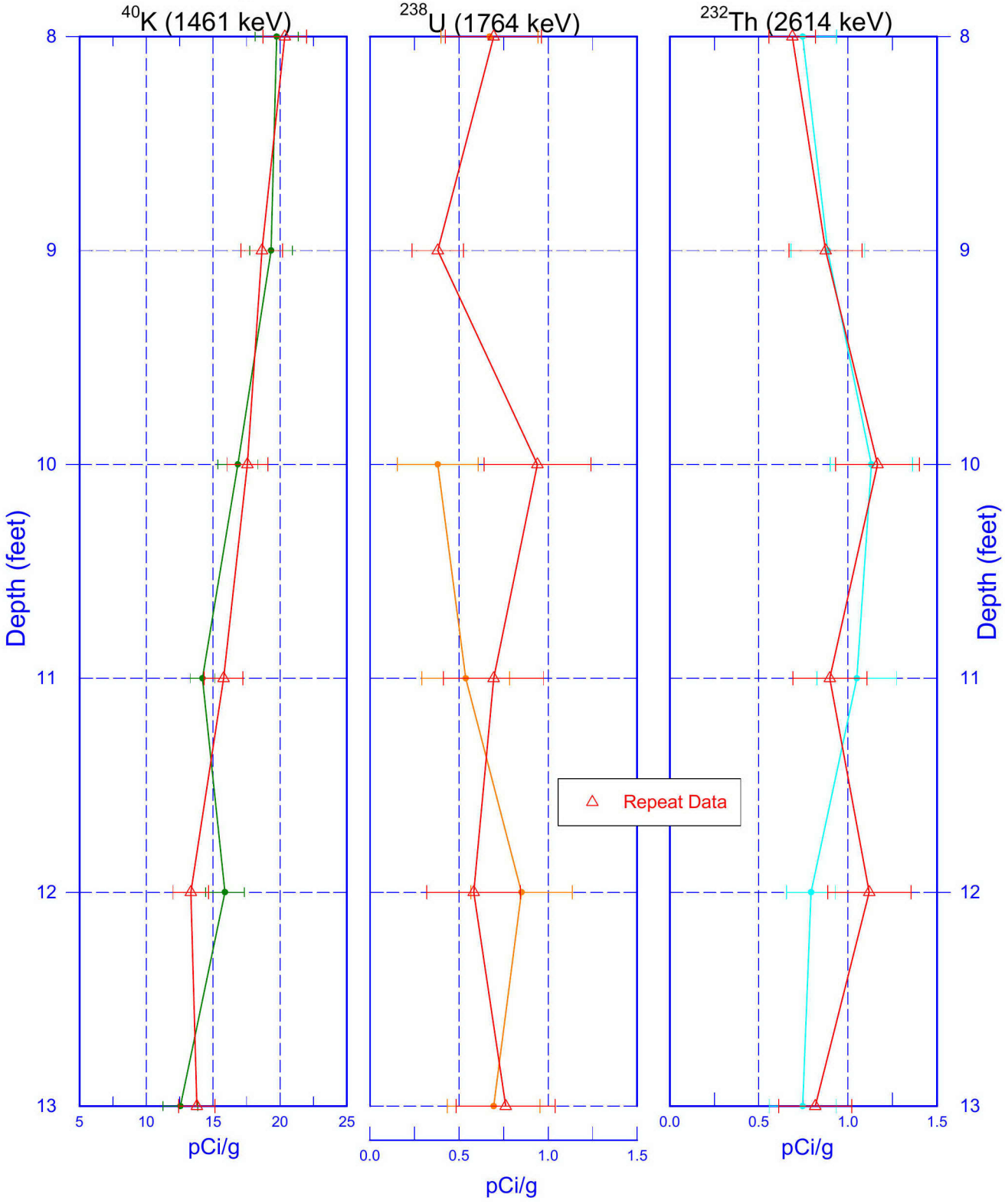
Reference - Ground Surface

HGLP-LDR-584, Rev. 0

Stoller
Hanford Office

399-3-38 (C8030)

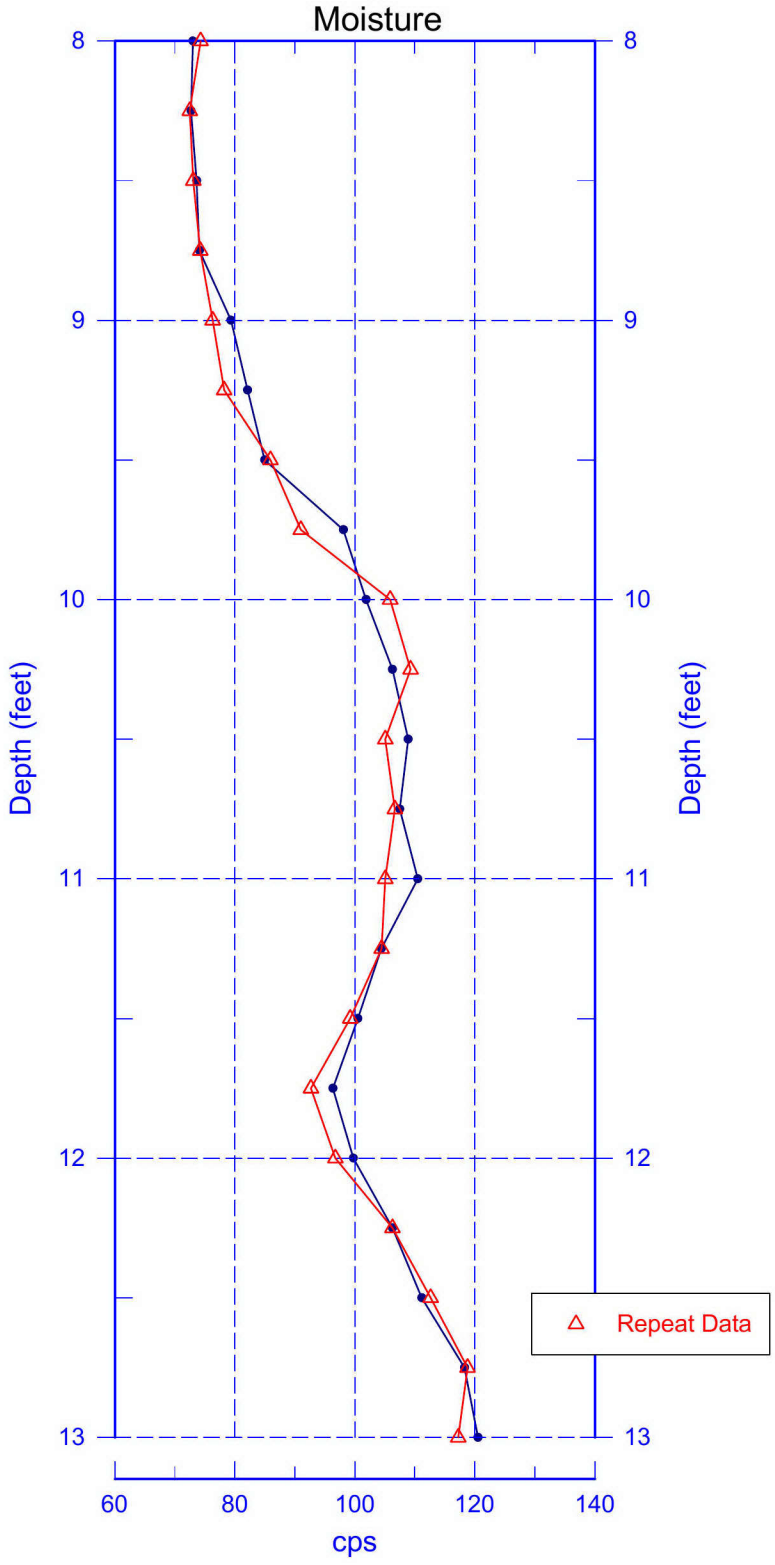
Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Stoller
Hanford Office

399-3-38 (C8030)
Moisture Repeat Section



Reference - Ground Surface

Stoller Hanford Office established 1959

HGLP-LDR-596, Rev. 0

399-6-5 (C8245)
Log Data Report

Borehole Information:

Log Date:	2011-01-12	Filename:	C8245_HG-NM_2011-01-12	Site:	300-FF-5
Coordinates (WA St Plane)		GWL[1] (ft):	45.9	GWL Date:	1/6/11
North (m)	East (m)	Drill Date	TOC[2] Elevation	Total Depth (ft)	Type
Unknown	Unknown	1/5/11	Unknown	156	Cable/Sonic

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded steel	3	12	10 7/8	9/16	3	47.0
Threaded steel	3.9	10 5/8	9 5/8	1/2	3.9	130.0
Threaded steel	4.2	10 5/8	9 5/8	1/2	4.2	145.8

Borehole Notes:

The total depth and casing depths were reported by the buyer's technical representative. The logging engineer measured casing stick-up, casing diameters (rounded to the nearest 1/16-in.), and depth to water.

Zero reference is ground surface.

Logging Equipment Information:

Logging System:	Gamma 4L		Type:	(60%) HPGe SGLS[3]
			Serial No.:	47-TP32211A
Effective Calibration Date:	1/20/10	Calibration Reference:	HGLP-CC-054, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

Logging System:	Gamma 4M		Type:	NMLS[4]
			Serial No.:	H340207279
Effective Calibration Date:	1/18/10	Calibration Reference:	HGLP-CC-052, Rev. 0	
		Logging Procedure:	HGLP-MAN-002, Rev. 1	

SGLS Log Run Information:

Log Run	1	2 Repeat	5	6 Repeat	7
HEIS number	1017572	1017573	1017574	1017575	1017576
Date	1/6/11	1/6/11	1/11/11	1/11/11	1/12/11
Logging Engineer	Spatz	Spatz	Halloway/ Spatz/ McClellan	Halloway/ Spatz/ McClellan	Pearson
Start Depth (ft)	0.0	42.0	45.0	74.0	142.0
Finish Depth (ft)	47.0	46.0	113.0	82.0	112.0
Count Time (sec)	100	100	100	100	100
Live/Real	R	R	R	R	R
Shield (Y/N)	N	N	N	N	N
MSA Interval (ft)	1.0	1.0	1.0	1.0	1.0
Log Speed (ft/min)	N/A	N/A	N/A	N/A	N/A
Pre-Verification	DLJ01CAB	DLJ01CAB	DLJ11CAB	DLJ11CAB	DLJ21CAB

[1] groundwater level
[2] top of casing
[3] Spectral Gamma Logging System
[4] Neutron Moisture Logging System

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HGLP-LDR-596, Rev. 0

Log Run	1	2 Repeat	5	6 Repeat	7
Start File	DLJ01000	DLJ01048	DLJ11000	DLJ11069	DLJ21000
Finish File	DLJ01047	DLJ01052	DLJ11068	DLJ11077	DLJ21030
Post-Verification	DLJ01CAA	DLJ01CAA	DLJ11CAA	DLJ11CAA	DLJ21CAA
Depth Return Error (in.)	N/A	0	0	0	N/A
Comments	No fine-gain adjustments made	No fine-gain adjustments made	No fine-gain adjustments made	No fine-gain adjustments made	No fine-gain adjustments made

Log Run	8 Repeat	9			
HEIS number	1017577	1017578			
Date	1/12/11	1/12/11			
Logging Engineer	Pearson	Pearson			
Start Depth (ft)	118.0	147.0			
Finish Depth (ft)	115.0	142.0			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
Log Speed ft/min	N/A	N/A			
Pre-Verification	DLJ21CAB	DLJ21CAB			
Start File	DLJ21031	DLJ21035			
Finish File	DLJ21034	DLJ21040			
Post-Verification	DLJ21CAA	DLJ21CAA			
Depth Return Error (in.)	0	0			
Comments	No fine-gain adjustments made	No fine-gain adjustments made			

NMLS Log Run Information:

Log Run	3	4 Repeat			
HEIS number	1017579	1017580			
Date	1/6/11	1/6/11			
Logging Engineer	Pearson	Pearson			
Start Depth (ft)	0.0	27.0			
Finish Depth (ft)	46.0	32.0			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
Log Speed ft/min	N/A	N/A			
Pre-Verification	DMU02CAB	DMU02CAB			
Start File	DMU02000	DMU02185			
Finish File	DMU02184	DMU02205			
Post-Verification	DMU02CAA	DMU02CAA			
Depth Return Error (in.)	N/A	0			
Comments	None	None			

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Logging Operation Notes:

SGLS data were collected using Gamma 4 HO 68B-3573. Pre- and post- survey verification measurements were acquired in the Amersham KUTh-115 field verifier. A centralizer was installed on the sonde.

NMLS data were collected using Gamma 4 HO 68B-3573. Pre- and post- survey verification measurements were acquired in the AmBe standard field verifier. A centralizer was installed on the sonde.

Analysis Notes:

Analyst:	C. Nelson	Date:	2/11/11	Reference:	HGLP-MAN-003, Rev. 0

The pre- and post-survey verification measurements met the acceptance criteria for the established systems.

Corrections for 9/16-in. casing from ground surface to 47 ft, and for 1/2-in. casing from 48-145 ft were applied during analysis, with the bottom two ft of the borehole uncorrected.

A water correction was applied from 46 ft to the total logged depth of the borehole.

SGLS spectra were processed in batch mode in APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated in EXCEL template identified as DL20100120, using efficiency functions and corrections for casing and dead time as determined by the systems' annual calibration.

During routine processing of gamma spectra, regions of interest are forced at specific energy levels associated with natural and manmade radionuclides that are anticipated to be present. This processing approach sometimes results in an isolated "detection" near the MDL[5] resulting in a false positive. Where these detections occur, the individual spectrum is scrutinized and a determination is made regarding the validity of the detection. If the detection is deemed not representative of a full energy peak, or if confirming peaks are not detected, it is removed from the data set. The integrity of the raw data files and the processed files are maintained should questions arise in the future regarding these determinations.

NMLS data are represented in counts per second because no calibration data exists for 10 7/8-in. or 9 5/8-in. diameter boreholes.

The HGU[6] is an empirical unit of gamma activity proposed as a means to standardize gamma log response across multiple logging systems with different response characteristics. The HGU is defined in terms of measurements in the Hanford Borehole Calibration Facility, and the magnitude is selected such that 1 HGU is approximately equivalent to typical Hanford background activity, based on data from background samples as reported in *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12).

Results and Interpretations:

Cs-137 was the only manmade radionuclide detected in this borehole. Cs-137 was detected at ground surface at approximately 0.3 pCi/g. Although not detected, the MDLs for U-235 and U-238 are plotted on the manmade radionuclide plot.

The neutron moisture log primarily responds to moisture present in the surrounding formation. In general, an increase in count rate reflects an increase in moisture content. Moisture content may increase in sediments of relatively high silt or clay content. Casing joints may be attenuating gammas and neutrons from the detector at approximately 10-ft intervals.

The KUT and moisture repeat plots indicate that the respective systems were working properly.

List of Plots:

Depth reference is ground surface

Manmade Radionuclides

[5] Minimum Detection Level
[6] Hanford Gamma Unit

Natural Gamma Logs
Combination Plot (2 pages)
Combination Plot (0-150 ft)
Total Gamma & Dead Time
Total Gamma & Moisture
Total Gamma & Hanford Gamma Unit
Repeat Section of Natural Gamma Logs (42-46 ft)
Repeat Section of Natural Gamma Logs (74-82 ft)
Repeat Section of Natural Gamma Logs (115-118 ft)
Moisture Repeat Section (27-32 ft)

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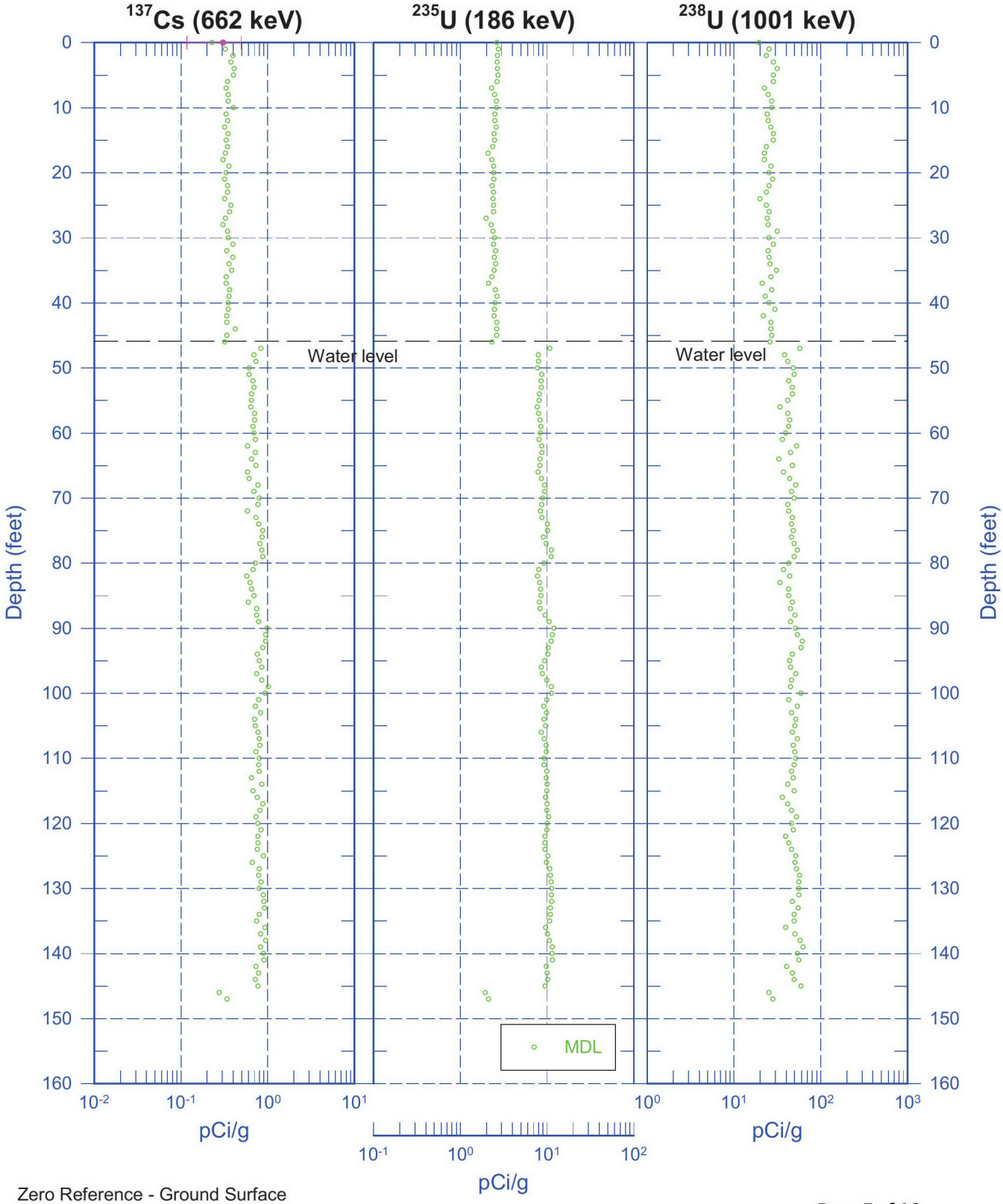
399-6-5 (C8245)
Manmade Radionuclides



Zero Reference - Ground Surface

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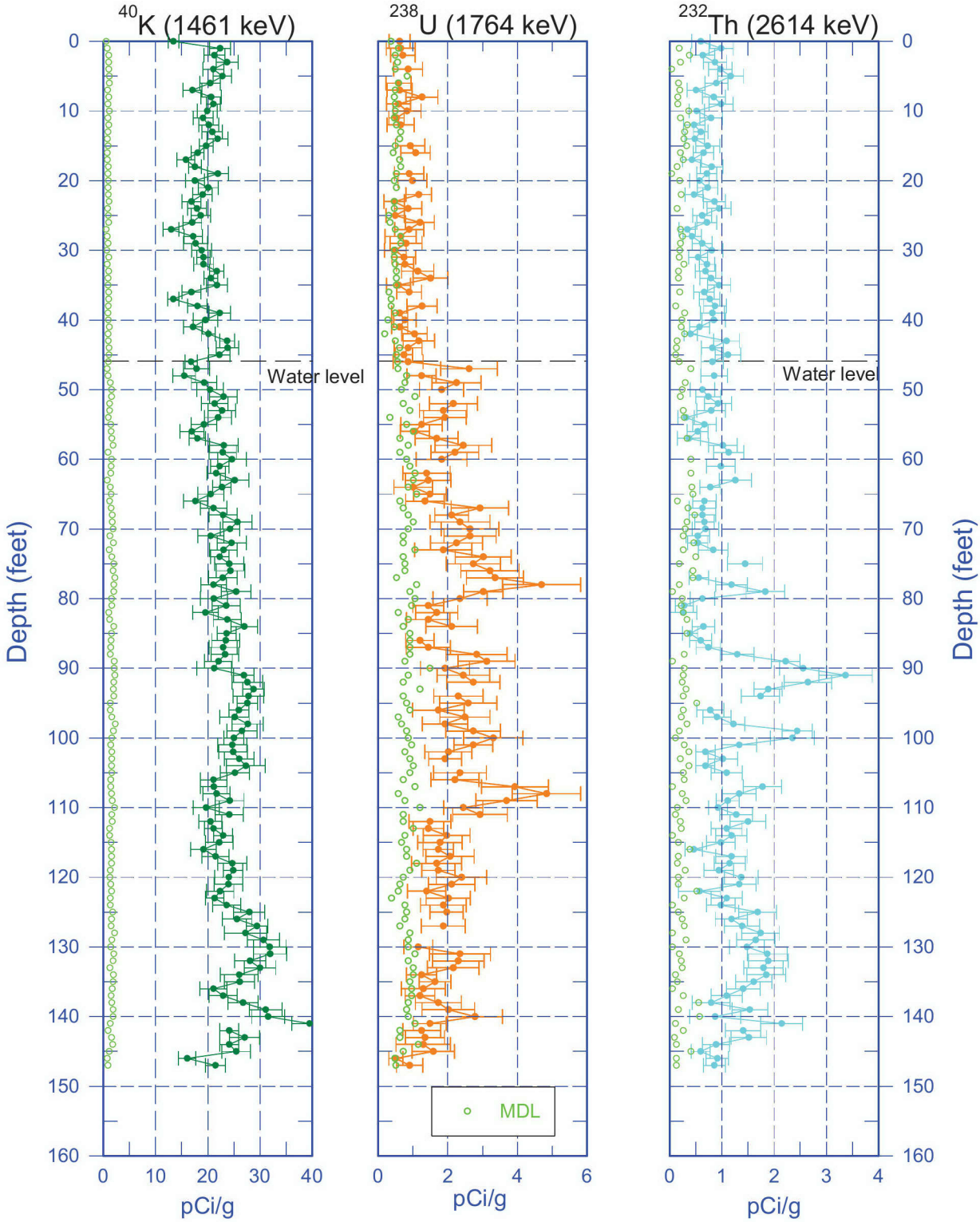
Hanford Office

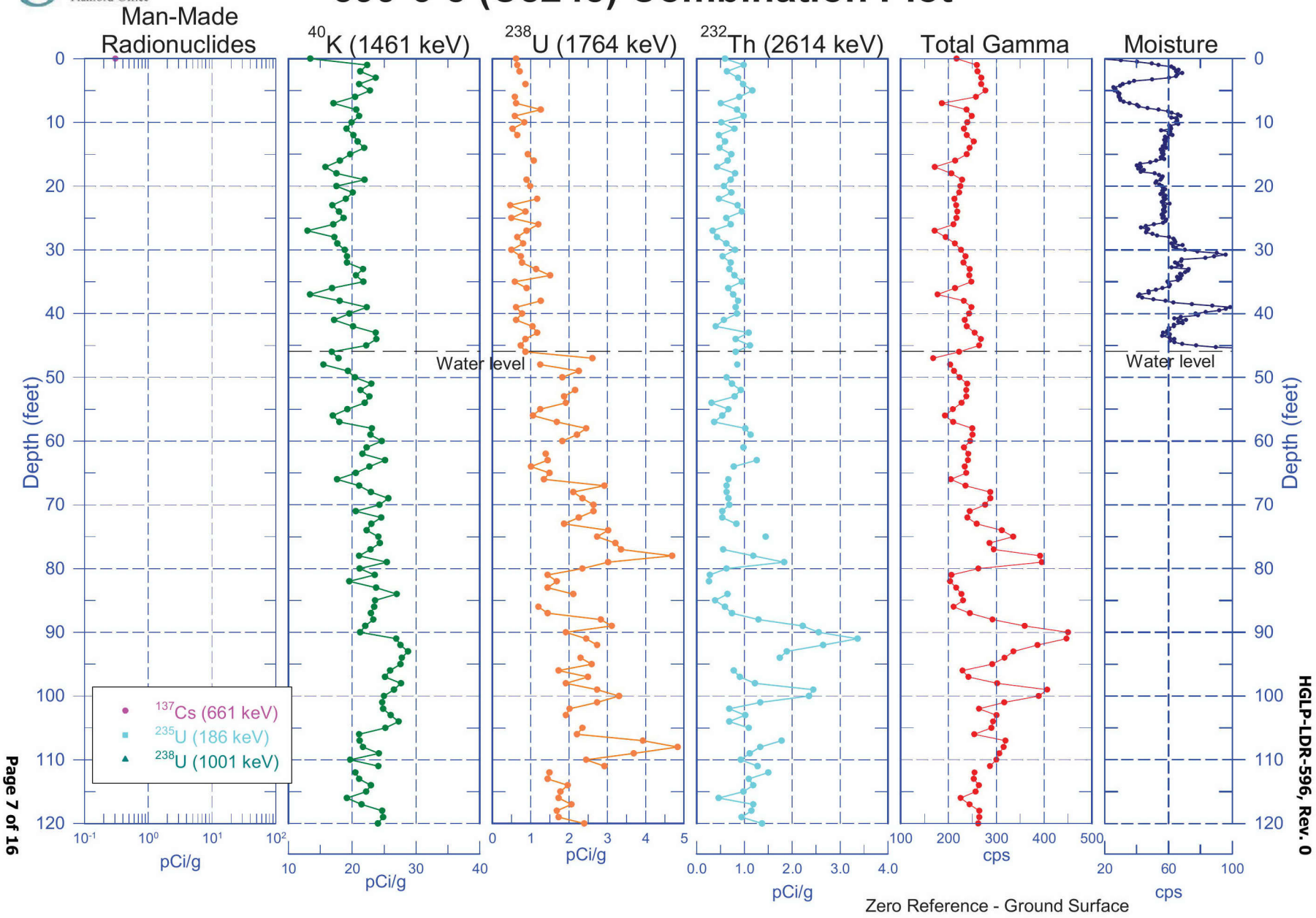
399-6-5 (C8245)
Natural Gamma Logs



Zero Reference - Ground Surface

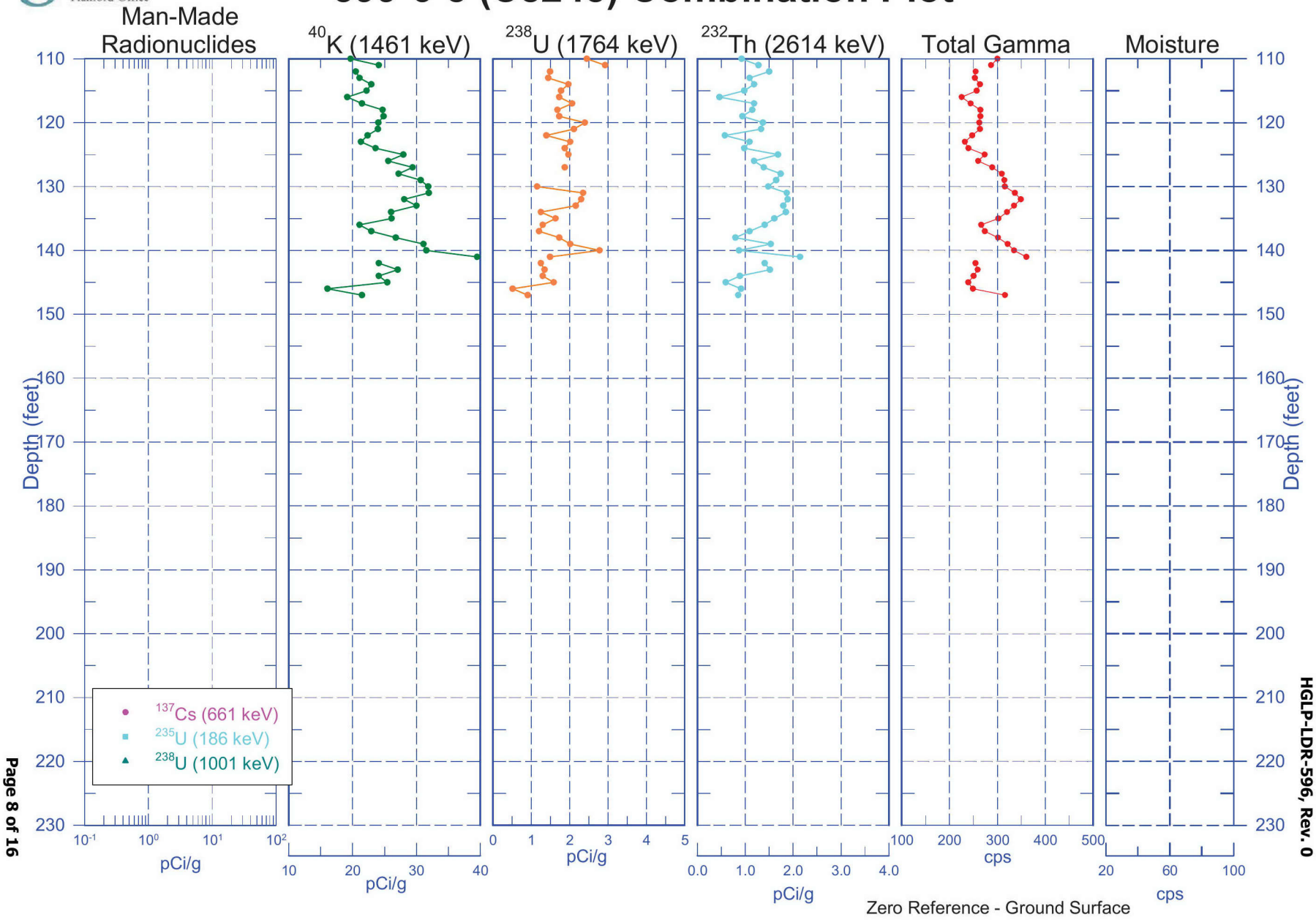
Stoller
Hanford Office

399-6-5 (C8245) Combination Plot



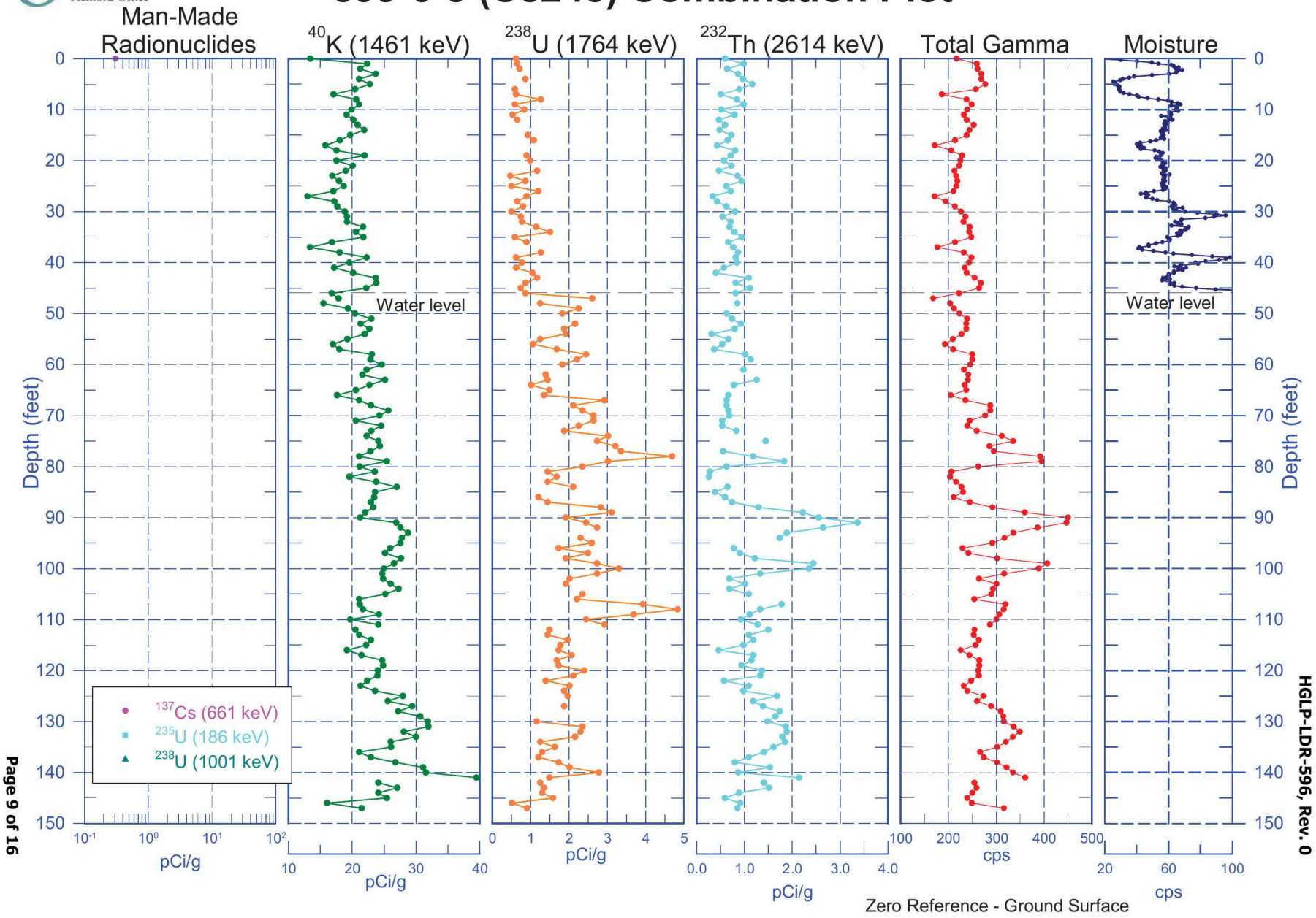
Stoller
Hanford Office

399-6-5 (C8245) Combination Plot



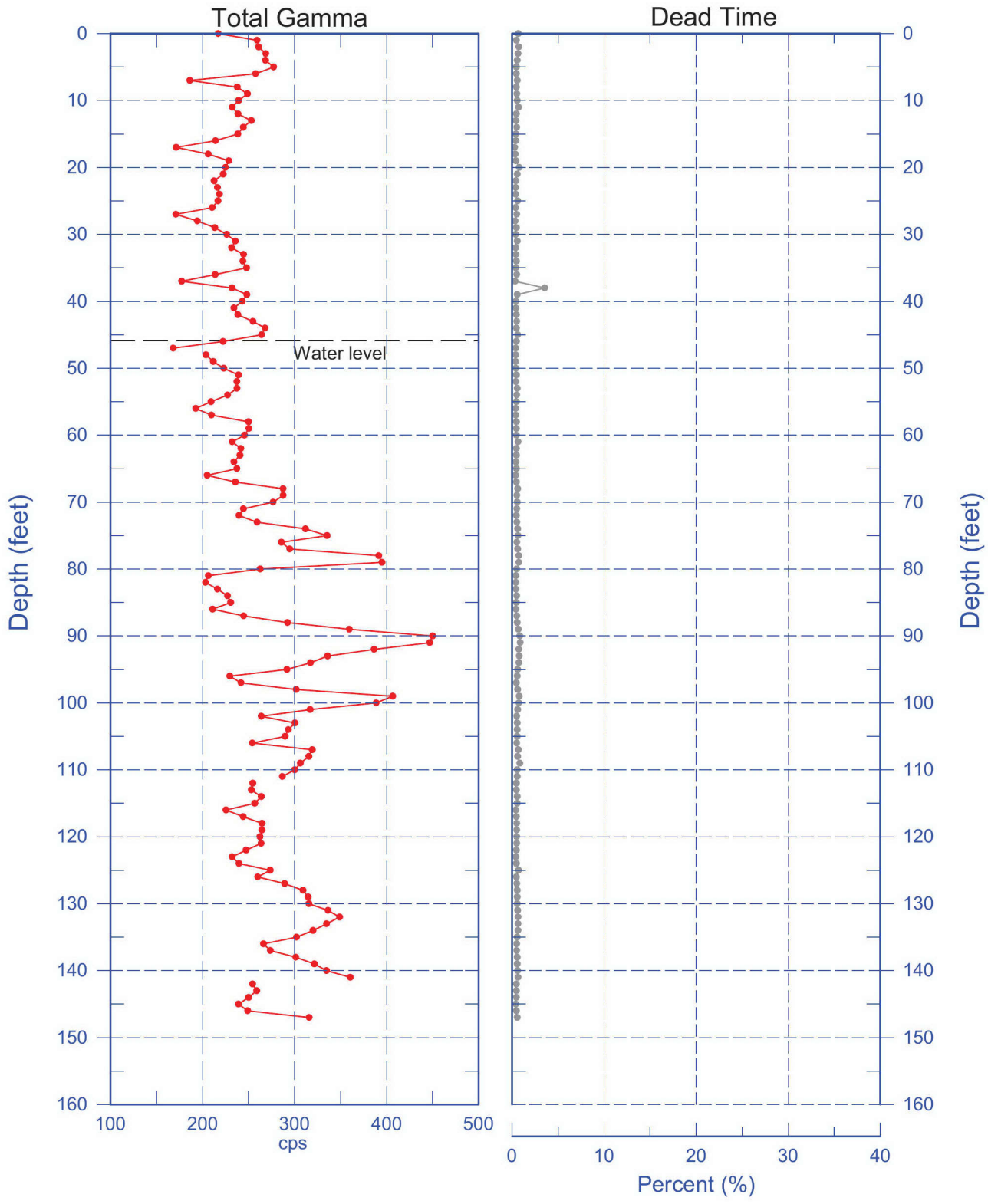
Stoller
Hanford Office

399-6-5 (C8245) Combination Plot



Stoller
Hanford Office

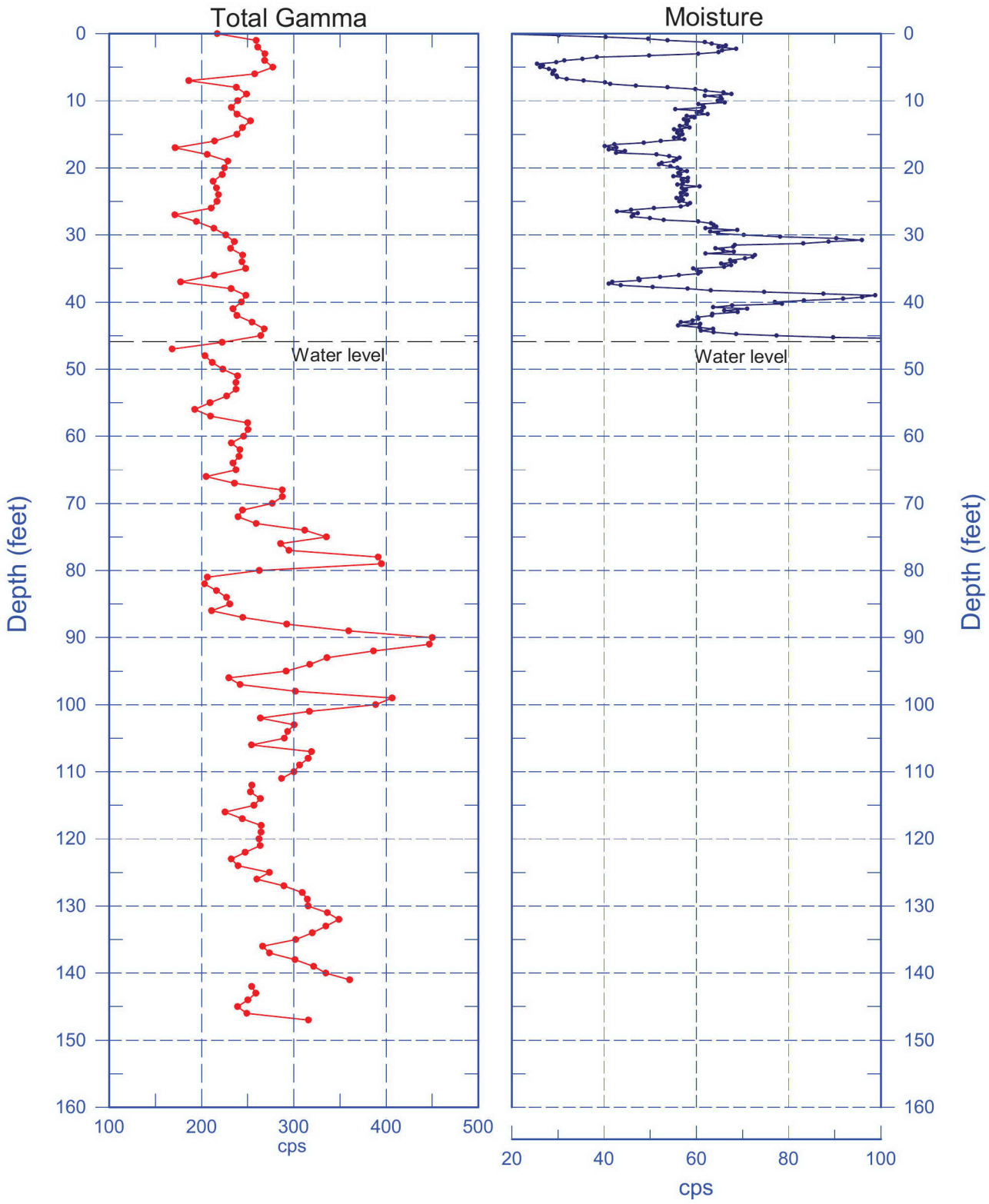
399-6-5 (C8245)
Total Gamma & Dead Time



Reference - Ground Surface

Stoller
Hanford Office

399-6-5 (C8245)
Total Gamma & Moisture

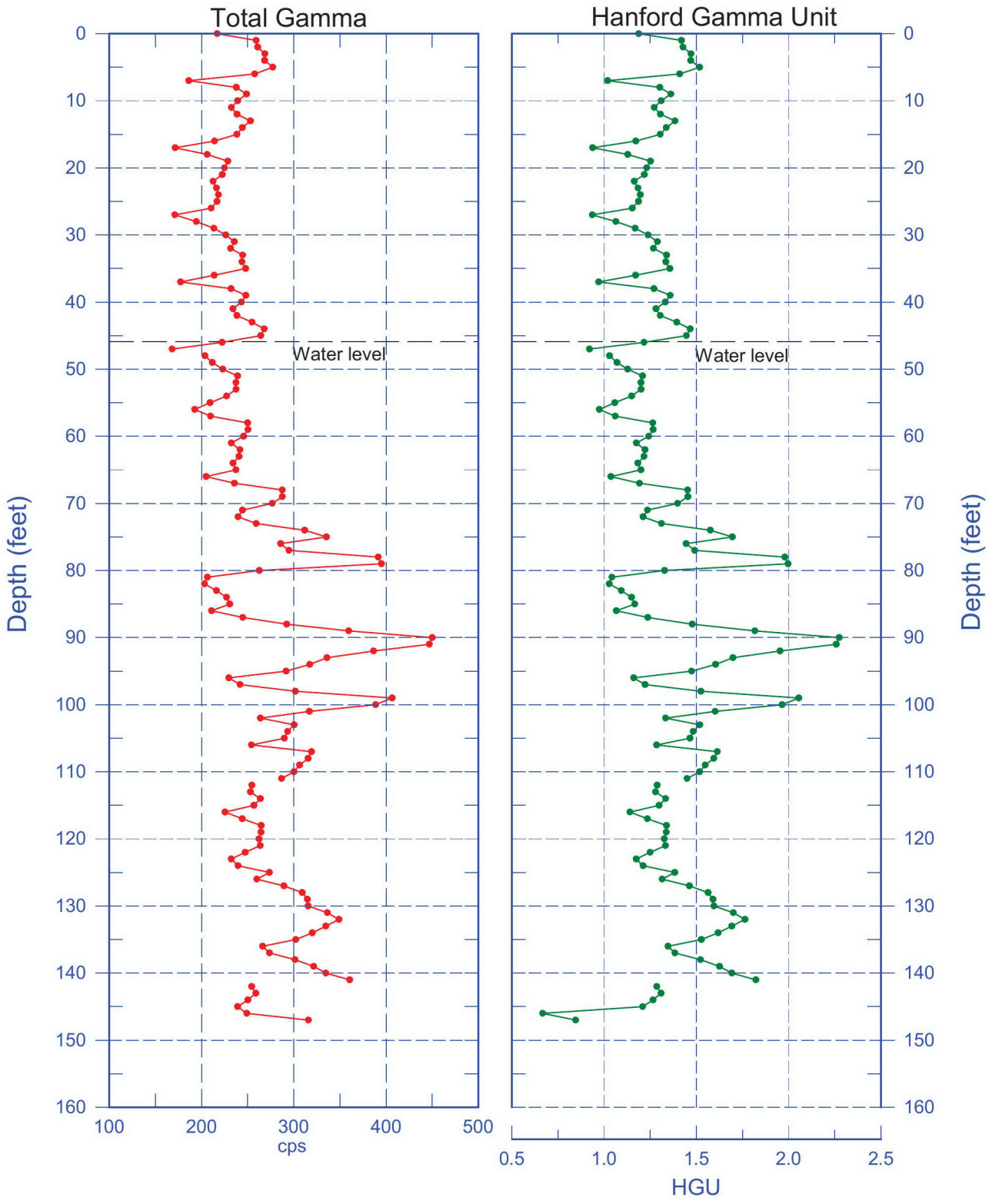


Reference - Ground Surface

Stoller Hanford Office

399-6-5 (C8245)

Total Gamma & Hanford Gamma Unit

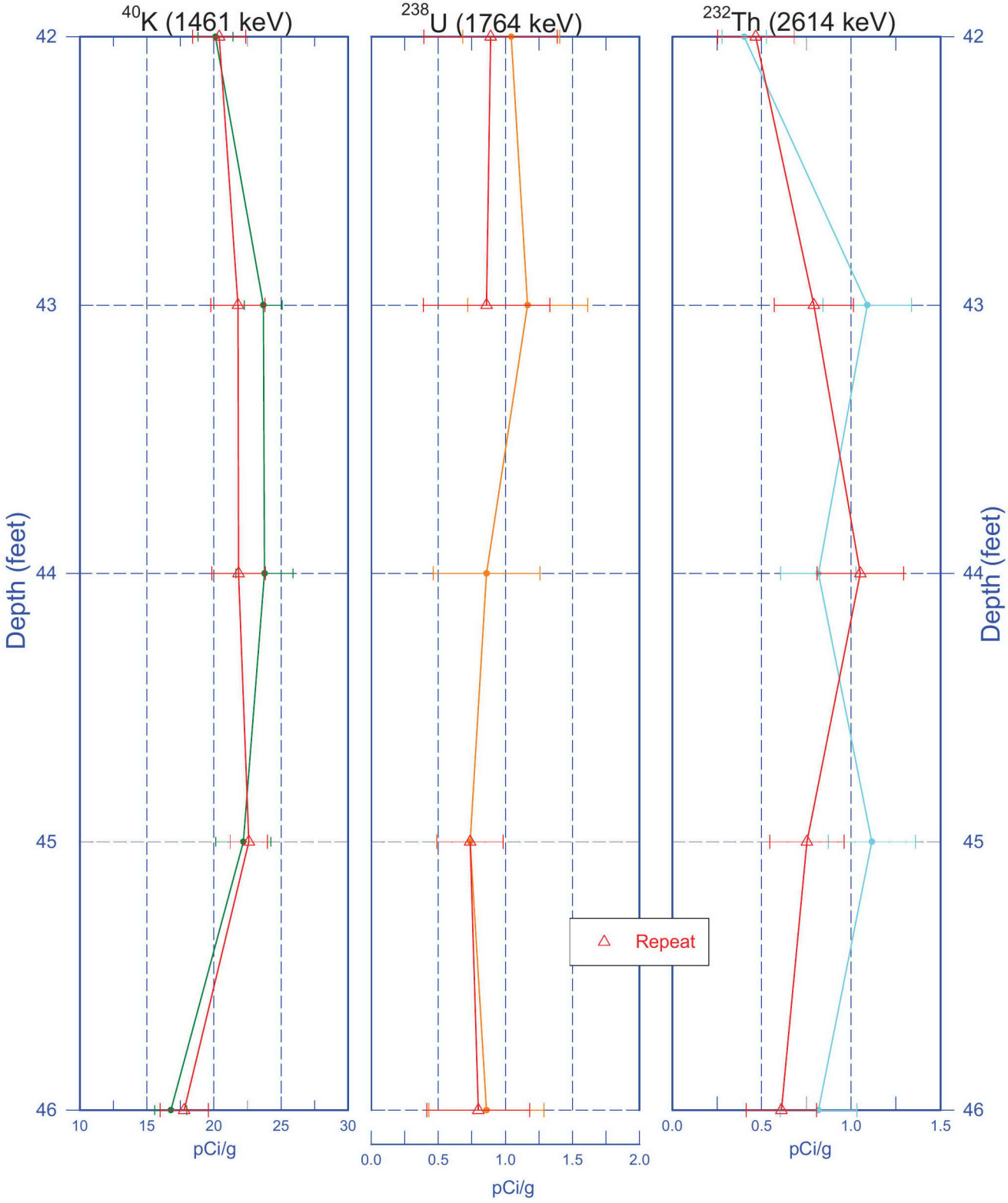


Reference - Ground Surface

Stoller Hanford Office

399-6-5 (C8245)

Repeat Section of Natural Gamma Logs

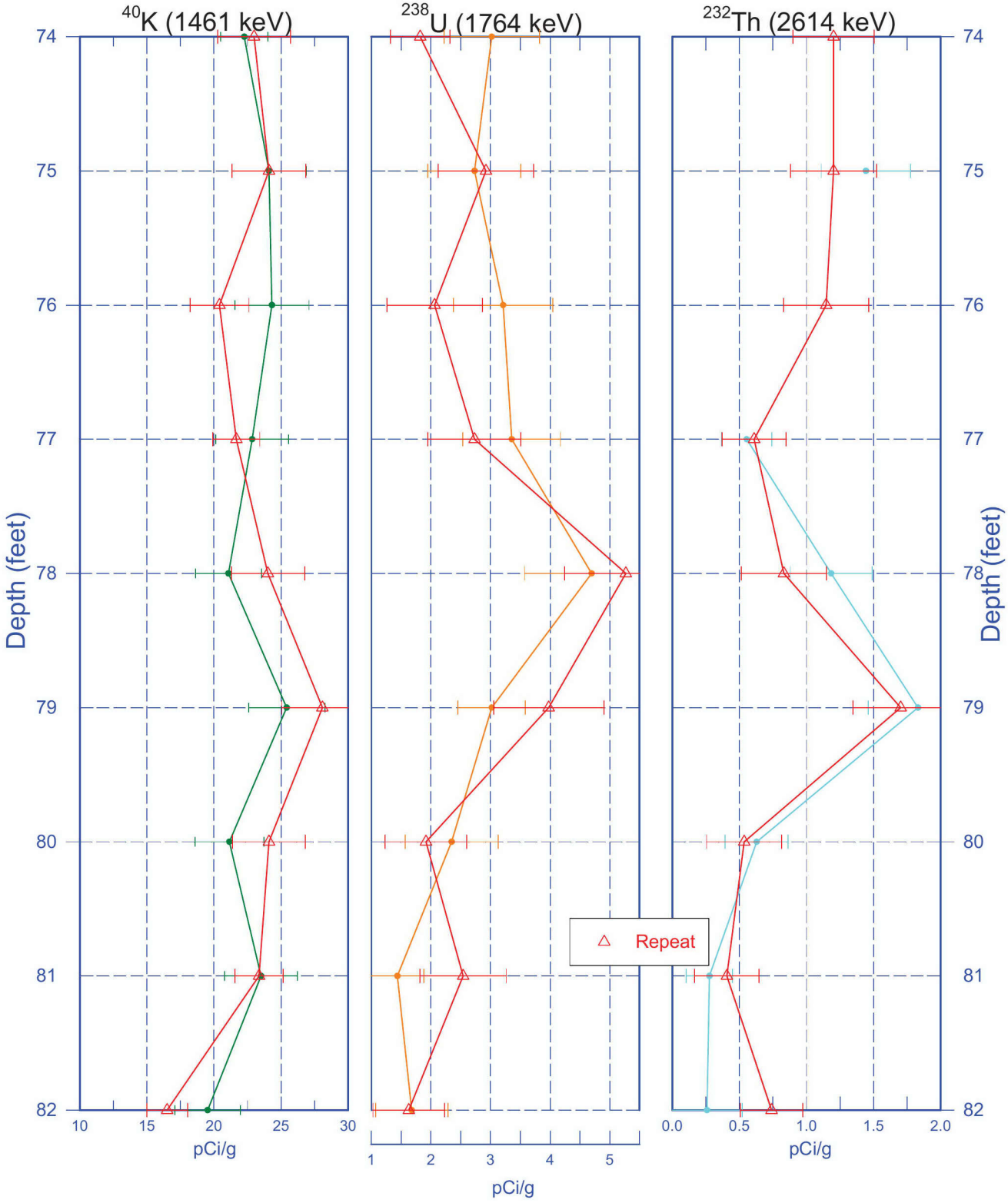


Zero Reference - Ground Surface

Stoller Hanford Office

399-6-5 (C8245)

Repeat Section of Natural Gamma Logs

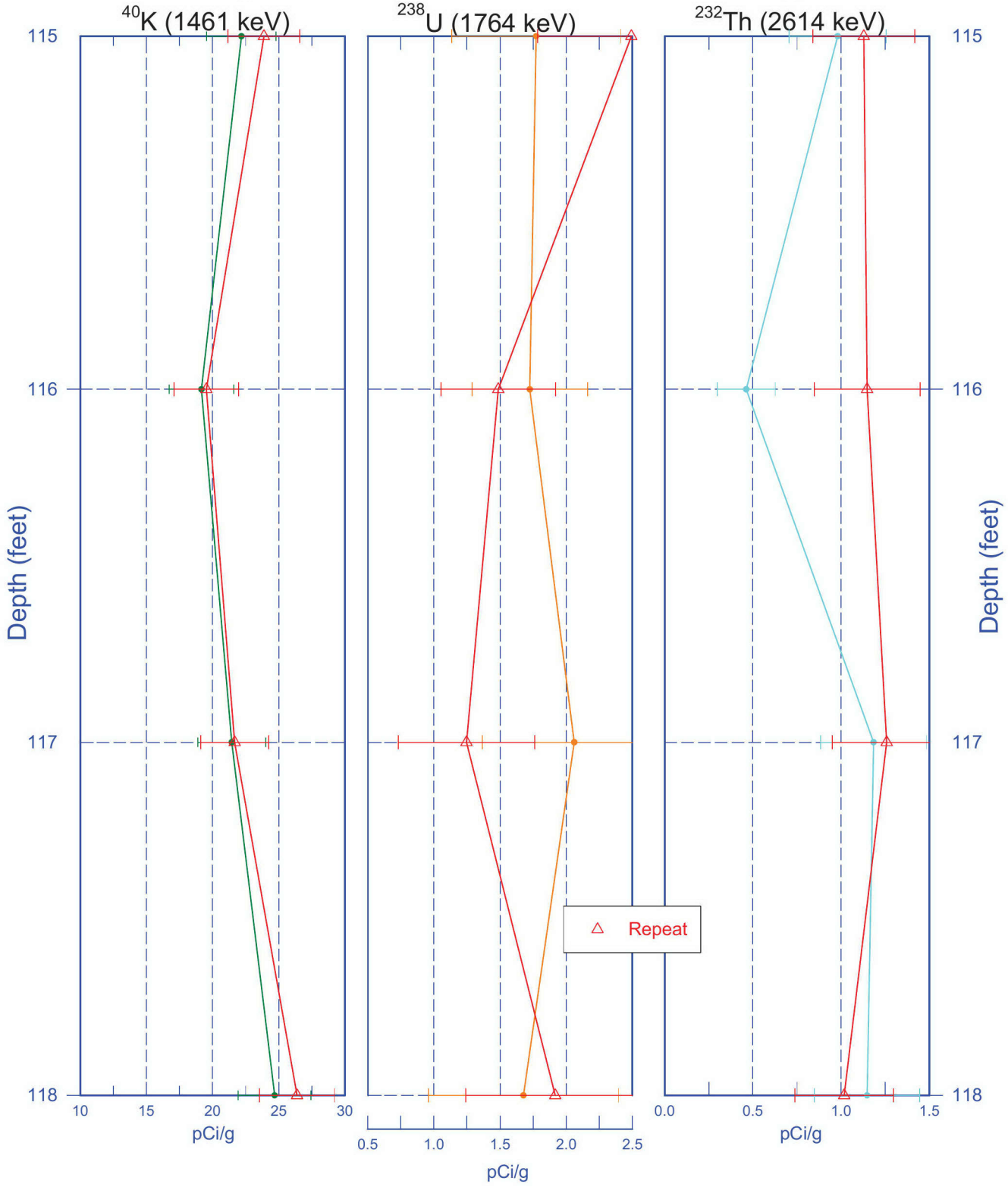


Zero Reference - Ground Surface

Stoller Hanford Office

399-6-5 (C8245)

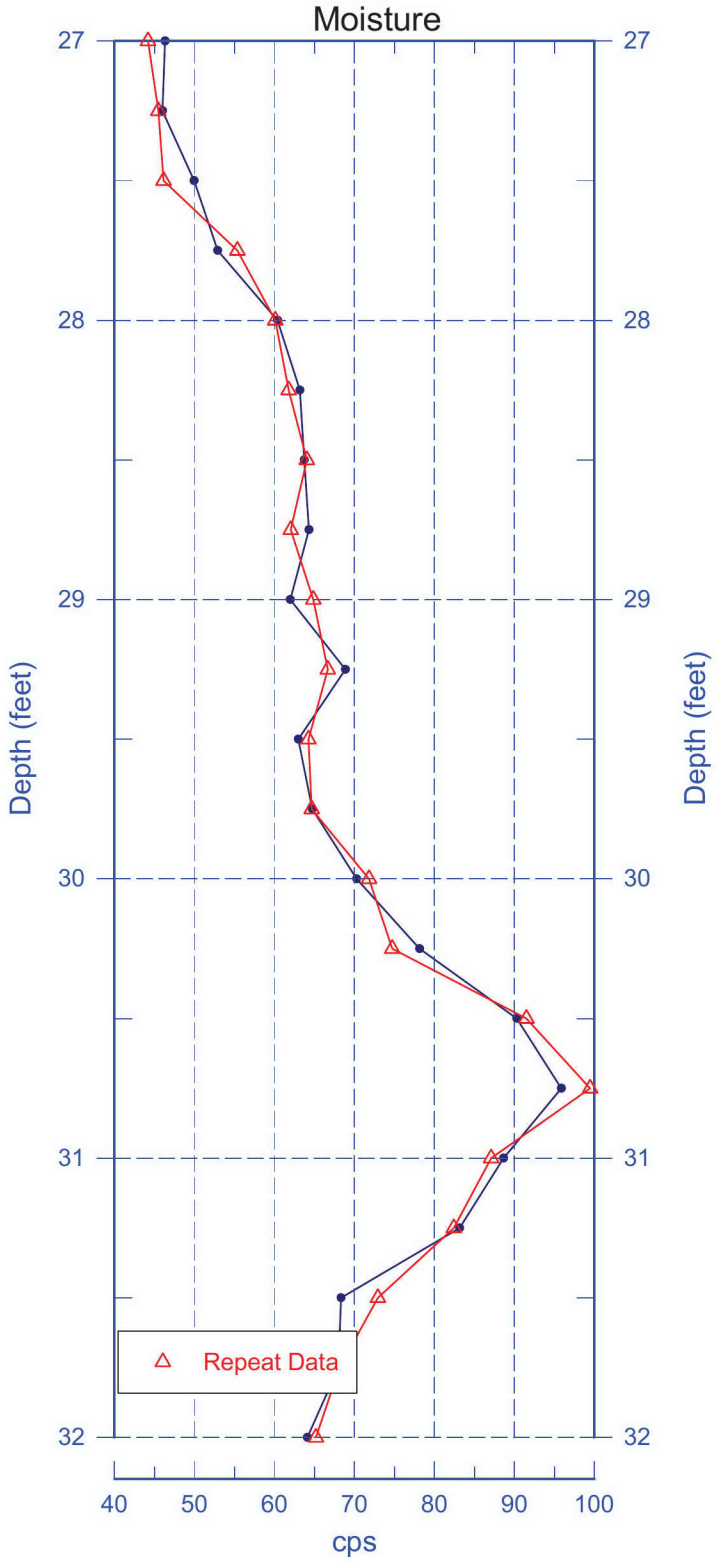
Repeat Section of Natural Gamma Logs



Zero Reference - Ground Surface

Stoller
Hanford Office

399-6-5 (C8245)
Moisture Repeat Section



Reference - Ground Surface

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Appendix D

Analytical Data

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D1 Introduction

This appendix summarizes the dataset compiled to support the Integrated 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units (OU) Remedial Investigation and Feasibility Study (RI/FS). The dataset provides the data and information used to support completion of the RI/FS Report. The dataset includes data from ongoing site programs (e.g., annual groundwater monitoring, waste site remediation), data from previous soil and groundwater investigations conducted in the 300 Area, and data collected specifically for the RI/FS as described in *300 Area Decision Unit Remedial Investigation/Feasibility Study Work Plan for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units* (DOE/RL-2009-30), hereinafter called the 300 Area RI/FS Work Plan, and the companion sampling and analysis plan (*300 Area Remedial Investigation/Feasibility Study Sampling and Analysis Plan for the 300-FF-1, 300-FF-2 and 300-FF-5 Operable Units* [DOE/RL-2009-45]), hereinafter called the 300 Area SAP. The following is a list of the available data that were compiled for the RI/FS dataset:

- Data collected as part of ongoing site sampling programs or before initiation of the current RI/FS field investigation activities
  - Waste site remediation action soil analytical data (available samples up to July 1, 2011)
  - Field investigation soil analytical data (available samples up to July 31, 2010)
  - Groundwater analytical data (January 1, 2006 to August 31, 2011)
  - Well and borehole drilling and construction information (to June18, 2010)
  - Fate and transport parameters (e.g., geochemical parameters, hydrogeologic parameters, soil physical properties) (to December 31, 2009)
  - Geologic information (to March 22, 2011)
  - Groundwater levels and river stage (to November 1, 2010)
- Data collected during the RI/FS field investigation activities (April 2010 to March 2011) as described in the 300 Area RI/FS Work Plan (DOE/RL-2009-30), and 300 Area SAP (DOE/RL-2009-45)
  - Soil analytical data
  - Groundwater analytical data
  - Soil physical properties (grain size, moisture content, and porosity)
  - Hydraulic conductivity
  - Geophysical logging
  - Distribution coefficient data for metals

Table D-1 is the key for all or the data tables. Tables D-1 through D-4 are summary tables presented later in this appendix. Tables D-5 through D-43are in electronic format and recorded on compact disk included with Appendix D.

The data compiled from work performed by other site activities to support the RI/FS are described in Chapter D2. The data compiled for the RI/FS field investigation activities are described in Chapter D3. The resulting data compiled for the project are included, unless incorporated by reference as described below.

Table D-1. Key to Data Tables

File or Table Name	Table Number	Contents
Key to Data Tables	D-1	List of data tables
Groundwater and Soil Samples Collected During RI Borehole and Well Drilling	D-2	List of samples collected during RI drilling
Wells for Spatial/Temporal Analysis	D-3	List of wells sampled to support spatial and temporal analysis uncertainty
300 Area Sample IDs for Spatial/Temporal Analysis	D-4	List of sample IDs for samples collected during spatial/temporal analysis
300_GWdata_Jan06toAug11	D-5	Groundwater analytical results from 300 Area groundwater monitoring wells - January 2006 through August 2011
DURA_19Apr_2012	D-6	Analytical results for groundwater samples collected to support spatial and temporal uncertainty
RI_Vadose_13Jun2011_1of2	D-7	Analytical results for soil samples collected during drilling
RI_Vadose_13Jun2011_2of2	D-8	
RI_GW_13Jun2011	D-9	Groundwater analytical results for samples collected during drilling
WCH_CVP_06Oct2011	D-10	Soil sample results from waste site cleanup verification packages
WL_399-1-1_2010_Data_1101	D-11	Groundwater elevation data for monitoring well 399-1-1
WL_399-1-2_2010_Data_1101	D-12	Groundwater elevation data for monitoring well 399-1-2
WL_399-1-7_2010_Data_1101	D-13	Groundwater elevation data for monitoring well 399-1-7
WL_399-1-10A_2010_Data_1101	D-14	Groundwater elevation data for monitoring well 399-1-10A
WL_399-1-12_2010_Data_1101	D-15	Groundwater elevation data for monitoring well 399-1-12
WL_399-1-13A_2010_Data_1101	D-16	Groundwater elevation data for monitoring well 399-1-13A
WL_399-1-16A_2010_Data_1101	D-17	Groundwater elevation data for monitoring well 399-1-16A
WL_399-1-17A_2010_data_1101	D-18	Groundwater elevation data for monitoring well 399-1-17A

Table D-1. Key to Data Tables

File or Table Name	Table Number	Contents
WL_399-1-21A_2010_Data_1101	D-19	Groundwater elevation data for monitoring well 399-1-21A
WL_399-1-23_2010_Data_1101	D-20	Groundwater elevation data for monitoring well 399-1-23
WL_399-1-32_2010_data_1101	D-21	Groundwater elevation data for monitoring well 399-1-32
WL_399-2-1_2010_Data_1101	D-22	Groundwater elevation data for monitoring well 399-2-1
WL_399-2-2_2010_Data_1101	D-23	Groundwater elevation data for monitoring well 399-2-2
WL_399-2-3_2010_Data_1101	D-24	Groundwater elevation data for monitoring well 399-2-3
WL_399-2-5_2010_Data_1101	D-25	Groundwater elevation data for monitoring well 399-2-5
WL_399-2-10_2010_data_1101	D-26	Groundwater elevation data for monitoring well 399-2-10
WL_399-3-18_2010_Data_1101	D-27	Groundwater elevation data for monitoring well 399-3-18
WL_399-3-19_2010_Data_1101	D-28	Groundwater elevation data for monitoring well 399-3-19
WL_399-3-20_2010_Data_1101	D-29	Groundwater elevation data for monitoring well 399-3-20
WL_399-3-21_2010_data_1101	D-30	Groundwater elevation data for monitoring well 399-3-21
WL_399-3-22_2010_data_1101	D-31	Groundwater elevation data for monitoring well 399-3-22
WL_399-3-26_2010_data_1101	D-32	Groundwater elevation data for monitoring well 399-3-26
WL_399-4-9_2010_data_1101	D-33	Groundwater elevation data for monitoring well 399-4-9
WL_399-4-14_2010_data_1101	D-34	Groundwater elevation data for monitoring well 399-4-14
WL_399-5-1_2010_data_1101	D-35	Groundwater elevation data for monitoring well 399-5-1
WL_399-6-1_2010_data_1101	D-36	Groundwater elevation data for monitoring well 399-6-1

Table D-1. Key to Data Tables

File or Table Name	Table Number	Contents
WL_399-8-1_2010_data_1101	D-37	Groundwater elevation data for monitoring well 399-8-1
qry_HIST_WL_300_Area_from DOE/RL-2010-11	D-38	Historical water level measurements
Awln_RiverStage_27Oct2010	D-39	Columbia River stage elevations
USGS_12472800	D-40	U.S. Geological Survey Columbia River water levels 1917 to 2009
300WellInfo.6.18.10xls	D-41	Monitoring well and borehole information
300_RI_Well_Sampling_05Dec2011	D-42	Analytical results for groundwater sample collected from RI wells after well completion
300_SO_Historical_Aug31_2010	D-43	Analytical results for soil samples collected during LFI and other historical soil investigations.

Source: DOE/RL-2010-11, Hanford Site Groundwater Monitoring and Performance Report for 2009: Volumes 1 and 2.

D2 Summary of the Data Compiled by Site Activities Used to Support the RI/FS

D2.1 Soil Analytical Data

Soil analytical data were compiled from waste site remedial actions (e.g., confirmation sampling, waste site excavation) and previous site investigation activities.

D2.1.1 Post-Remedial Action Waste Site Data

Samples numbers and locations used to support approved waste site reclassification within the 300 Area were compiled to July 1, 2011. The data represent soil remaining in place at waste sites that were remediated interim closed, or required no further action based on sampling results and analysis. Specific details regarding sampling methods and locations are provided in the Cleanup Verification Package (CVP) and Remaining Sites Verification Package (RSVP) reports prepared for each waste site, listed below. These data were extracted from the Hanford Environmental Information System (HEIS) database on October 6, 2011 are presented in Table D-1.

The following types of data are not included in the waste site post-remedial action soil analytical data:

- Quality control (QC) samples (e.g., equipment blanks, field trip blanks)
- Variance samples
- In-process samples

The 300 Area data were compiled based on the following CVP and RSVP reports related to waste site remedial actions:

- BHI-01134, *300-FF-2 Waste Site 300-10 Verification Package.*

- BHI-01135, *300-FF-1 Waste Site 300-44 Verification Package*.
- BHI-01136, *300-FF-2 Waste Site 300-45 Verification Package*.
- WSRF 98-04, *Waste Site Reclassification Form*, Operable Unit 300-FF-1, Waste Site Code 300 Ash Pits.
- WSRF 99-050, *Waste Site Reclassification Form*, Operable Unit 300-FF-1, Waste Site Code 316-2, 618-12, UPR-300-7.
- WSRF 99-108, *Waste Site Reclassification Form*, Operable Unit 300-FF-1, Waste Site Code 316-5.
- WSRF 2000-109, *Waste Site Reclassification Form*, Operable Unit 300-FF-1, Waste Site Code 300-49 (Landfill 1A).
- WSRF 2000-110, *Waste Site Reclassification Form*, Operable Unit 300-FF-1, Waste Site Code 300-50 (Landfill 1B).
- WSRF 2000-111, *Waste Site Reclassification Form*, Operable Unit 300-FF-1, Waste Site Code 628-4 (Landfill 1D).
- WSRF 2000-112, *Waste Site Reclassification Form*, Operable Unit 300-FF-1, Waste Site Code 316-1 South Process Pond, 300 RFBP Retired Filter Backwash Pond, and 300-262 Contaminated Soil West of South Process Pond.
- WSRF 2002-049, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 300-272.
- WSRF 2003-055, *Waste Site Reclassification Form*, Operable Unit 300-FF-1, Waste Site Code 618-4 Burial Ground.
- WSRF 2003-056, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 618-5 Burial Ground.
- WSRF 2005-026, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 300-18, Surface Contaminated Area #4.
- WSRF 2005-027, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 600-47 Dumping Area.
- WSRF 2005-039, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 300-8.
- WSRF 2005-051, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 600-259, Special Waste Form Lysimeter and 600-259:1 Grout Waste Test Facility.
- WSRF 2005-060, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 300 VTS, 300 Area Vitrification Test Site.
- WSRF 2006-035, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 618-3.
- WSRF 2006-036, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 618-8.
- WSR 2006-062, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 618-2.

- WSRF 2007-033, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 600-243.
- WSRF 2008-020, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 331 LSLDF.
- WSRF 2008-050, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 618-7.
- WSRF 2008-059, *Waste Site Reclassification Form*, Operable Units 300-FF-1 and 300-FF-2, Waste Site Code 300-275.
- WSRF 2009-032, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 618-13.
- WSRF 2009-055, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 600-290:1.
- WSRF 2009-059, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 300-259.
- WSRF 2010-009, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code UPR-300-46.
- WSRF 2010-010, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 300-109.
- WSRF 2010-014, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code UPR-300-17.
- WSRF 2010-028, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 618-1, 618-1:1, 618-1:2, 333 LHWSA, UPR-300-13, and UPR-300-14.
- WSRF 2010-058, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 300-33, 300-256, 300-41.
- WSRF 2010-074, *Waste Site Reclassification Form*, Operable Unit 300-FF-2, Waste Site Code 300-260.

D2.1.2 Historical Remedial Investigation Data

Soil analytical data from Limited Field Investigation (LFI) reports and other investigation activities not directly related to waste site remediation were compiled.

Available historical soil analytical data to August 31, 2010 in HEIS were exported from HEIS on November 2, 2010. The following references provided Sample IDs for data within 300 Area:

- DOE/RL-92-43, *Phase I Remedial Investigation Report for the 300-FF-1 Operable Unit*.
- DOE/RL-93-21, *Phase I Remedial Investigation Report for the 300-FF-5 Operable Unit*.
- DOE/RL-96-42, *Limited Field Investigation Report for the 300-FF-2 Operable Unit*.
- PNNL-14834, *Sampling and Hydrogeology of the Vadose Zone Beneath the 300 Area Process Ponds*.
- PNNL-15417, *Borehole Data Package for One CY 2005 CERCLA Well 699-S20-E10, 300-FF-5 Operable Unit, Hanford Site, Washington*.

- PNNL-16435, *Limited Field Investigation for Uranium Contamination in the 300-FF-5 Operable Unit at the 300 Area, Hanford Site, Washington*.
- PNNL-17666, *Volatile Organic Compound Investigation Results, 300 Area, Hanford Site, Washington*.
- SGW-36424, *Borehole Summary Report for 300-FF-5 Operable Unit TCE Characterization Monitoring Wells C5575, C5706, C5707 and C5708*.
- WHC-SD-EN-TI-125, *Sampling and Analysis of the 300-FF-5 Operable Unit Springs and Near Shore Sediments and River Water*.
- WHC-SP-0193, *300 Area Process Trench Sediment Analysis Report*.

Quality control (QC) samples (e.g., equipment blanks, field trip blanks) are not included in the soil analytical data.

D2.2 Groundwater Analytical Data

Electronically available groundwater analytical data for 300 Area in support of the RI/FS were compiled from available sampling locations (including existing wells and aquifer tubes). The data were compiled from January 1, 2006 to August 31, 2011 to cover the last five years of sampling data. The files were downloaded from the Hanford Virtual Library (portal to HEIS) on May 2, 2011, and included all available sampling locations and analytical constituents within the 300 Area.

D2.3 Well and Borehole Information

Well and borehole information includes horizontal coordinates, drill date, well status (e.g., in use, decommissioned), total depth, and well screen information, where available. The data were compiled from information available in the Hanford Well Information System (HWIS) and the Hanford QMAP geospatial map portal WIDS and Wells mapping application on June 18, 2010.

D2.4 Fate and Transport Parameters

Data and information to support fate and transport evaluations for the RI/FS consisted of the following parameters:

- Contaminant distribution coefficients
- Dispersivity
- Hydraulic conductivity
- Bulk density

Data related to these parameters are available in the following reports:

- DOE/RL-92-43, *Phase I Remedial Investigation Report for the 300-FF-1 Operable Unit*.
- PNL-2949, *Geohydrology and Ground-Water Quality Beneath the 300 Area, Hanford Site, Washington*.
- PNL-6716, *Interim Characterization Report for the 300 Area Process Trenches*.
- PNNL-10508, *Estimation of Natural Ground Water Recharge for the Performance Assessment of a Low-Level Waste Disposal Facility at the Hanford Site*.

- PNNL-14022, *300 Area Uranium Leach and Adsorption Project*.
- PNNL-14320, *Soil-Gas Survey and Well Installations at the 618-10 Burial Ground, 300-FF-5 Operable Unit, Hanford Site, Washington*.
- PNNL-15417, *Borehole Data Package for One CY 2005 CERCLA Well 699-S20-E10, 300-FF-5 Operable Unit, Hanford Site, Washington*.
- PNNL-16435, *Limited Field Investigation for Uranium Contamination in the 300-FF-5 Operable Unit at the 300 Area, Hanford Site, Washington*.
- PNNL-17708, *Three-Dimensional Groundwater Models of the 300 Area at the Hanford Site, Washington State*.
- PNNL-17793, *Uranium Contamination in the 300 Area: Emergent Data and Their Impact on the Source Term Conceptual Model*.
- WHC-SD-EN-TI-038, S*ummary of Drilling and Test Pit Activities for the 300-FF-1 Operable Unit Phase I Soil Sampling Investigation*.
- WHC-SD-EN-TI-052, *Phase I Hydrogeologic Summary of the 300-FF-5 Operable Unit, 300 Area*.
- WHC-SD-EN-TI-125, *Sampling and Analysis of the 300-FF-5 Operable Unit Springs and Near Shore Sediments and River Water*.
- WHC-EP-0500, *Geology and Hydrology of the 300 Area and Vicinity, Hanford Site, South-Central, Washington*.

D2.5 Geologic Information

Geologic contact information between major units was compiled for the 300 Area. Geologic contact data for the Hanford Site have been compiled for alluvial deposits, the Hanford formation, the Cold Creek unit, Ringold Formation, and basalt units. Available geologic contact data through March 22, 2011 for 300 Area were provided by the geologic contacts database team on March 23, 2011.

D2.6 Groundwater Levels and River Stage

Data for groundwater depths and elevations and river stage elevations were compiled for 300 Area. River stage and groundwater depths and elevations were compiled from three sources: the Hanford Automated Water Level Network (AWLN) database, Pacific Northwest National Laboratory (PNNL), and *Hanford Site Groundwater Monitoring for Fiscal Year 2008* (DOE/RL-2008-66).

D2.6.1 Groundwater Levels

Pacific Northwest National Laboratory provided groundwater elevations collected by automated and manual water level measurement techniques for available 300 Area wells for January 1, 2008 to September 1, 2010. The data were provided on December 17, 2010. An annual groundwater monitoring report is published for the Hanford Site. In each annual report available online, a data file is provided that contains historical groundwater measurements for the Hanford Site. Groundwater elevation data for 300 Area wells were extracted from the data files from *Hanford Site Groundwater Monitoring and Performance Report for 2009: Volumes 1 & 2* (DOE/RL-2010-11) on October 27, 2010. The 2010 annual groundwater report data is available at the following web address: http://www.hanford.gov/c.cfm/sgrp/GWRep10/html/start10.htm. The date range of the available data was July 29, 1948 to June 29, 2010.

D2.6.2 River Stage

The Hanford AWLN is an array of wells and river gauges equipped with remote automated stations that collect data at individual locations (primarily wells and selected river gauge stations). The data are downloaded via radio frequency (RF) to a base station, which in turn uploads these data to a search and query language (SQL) server database. These water elevation measurements are recorded and stored on an hourly basis. The database also contains manual water level measurements for some wells and river gauges. Data from one 300 Area river gauge from November 15, 1991 (the earliest data for which river stage data were available in the AWLN database for 300 Area) to August 31, 2010 were downloaded from the AWLN database on October 27, 2010.

Additional river stage data were downloaded from the United State Geological Survey (USGS) site for Priest Rapids Dam gauge (the closest Columbia River dam to the Hanford Site) on May 10, 2010 (*USGS Water Data for the Nation* [USGS, 2007]). The website address is http://waterdata.usgs.gov/wa/nwis/uv?site_no=12472800. Priest Rapids Dam is located approximately 28 km (18 miles) upstream of the 300 Area. Daily discharge information for the gauge was available from October 1, 1917 to December 31, 2009. Daily gauge height information was available from October 3, 1992 to December 3, 2009.

D3 Summary of the RI/FS Field Investigation Activities Data Compilation

Samples for the 300 Area RI/FS are being collected per the 300 Area SAP (DOE/RL-2009-45). According to the 300 Area SAP (DOE/RL-2009-45), soil and water samples were collected from new boreholes and wells and included soil contaminant analytical data, soil physical properties (grain size, porosity, and moisture content), soil distribution coefficient data, and groundwater contaminant analytical data. In addition, groundwater samples for analytical analyses are being collected from existing monitoring wells to evaluate spatial and temporal uncertainties with respect to groundwater contaminant concentrations.

D3.1 Sample Summary for RI Boreholes and Wells

The following new boreholes and wells were drilled to support the 300 Area RI/FS process (as described in Chapter 3 and the SAP): C7653, C7654, C7655, C7656, C7657, C7658, C7659, C7660, C7661, C7662, C7663, C8026, C8027, C8028, C8029, C8030, and C8242. Soil and groundwater Sample IDs associated with these boreholes are presented in Table D-2.

D3.1.1 RI Soil Samples Collected During Drilling

Data for soil samples (listed in Table D-2) collected during drilling of RI/FS boreholes and wells were extracted from HEIS on June 13, 2011. Some data for batch leach testing to calculate distribution coefficient analysis were not loaded into HEIS because of format issues. These data are available in *Data Package of Samples Collected for Hydrogeologic and Geochemical Characterization: 300 Area RI/FS Sediment Cores* (PNNL-20412).

The following types of data are not included in the soil analytical data provided in this appendix:

- Quality control (QC) samples (e.g., equipment blanks, field trip blanks)
- Parent sample IDs for batch leach testing and soil physical properties for which no analysis was performed and therefore no data returned to HEIS

D3.1.2 RI Groundwater Samples

Data for groundwater samples collected during drilling of RI/FS boreholes and wells were extracted from HEIS on June 13, 2011, for the samples listed in Table D-2. Data for groundwater samples collected from

RI wells after well completion were extracted from HEIS on December 5, 2011 and are included in Table D-42.

D3.1.3 Geophysical Logging

Geophysical logging was performed in all the RI boreholes. The geophysical logging results are available in the borehole summary reports.

D3.2 Spatial and Temporal Uncertainty Groundwater Samples

Samples from groundwater monitoring wells were collected as part of the RI to support spatial and temporal uncertainty in groundwater concentrations. Three rounds of groundwater samples were collected from the wells listed in Table D-3. Sample IDs associated with each well and sampling event are provided in Table D-4.

D3.3 Data Verification and Validation

Data collected for the RI/FS were verified and validated. Verification is the process of evaluating the completeness, correctness, and conformance/compliance of the data against the method, procedural, or contractual requirements for the laboratory.

The purpose of the data validation is to determine, through the evaluation of supporting documentation, whether data meet precision and accuracy requirements of an analytical method and the data quality goals established during the planning phase have been achieved. The results of project data validation are summarized in the Data Quality Assessment.

D3.4 Data Quality Assessment

The data quality assessment for the vadose zone characterization component of the 300 Area RI/FS is provided in *300 Area Remedial Investigation/Feasibility Study Data Quality Assessment Report* (WCH-519). The data quality assessment for the aquifer characterization component of the 300 Area RI/FS is provided in Attachment D1.

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-1-54	C7653	B28311	GW
399-1-54	C7653	B28312	GW
399-1-54	C7653	B28313	GW
399-1-54	C7653	B28315	GW
399-1-54	C7653	B28366	GW
399-1-54	C7653	B25C44	SO
399-1-54	C7653	B25C45	SO
399-1-54	C7653	B25C46	SO
399-1-54	C7653	B25C47	SO
399-1-54	C7653	B25C48	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-1-54	C7653	B25C49	SO
399-1-54	C7653	B25C49-A	SO
399-1-54	C7653	B25C51	SO
399-1-54	C7653	B25DT1	SO
399-1-54	C7653	B25DT2	SO
399-1-54	C7653	B25DT3	SO
399-1-54	C7653	B25DT4	SO
399-1-54	C7653	B277Y8	SO
399-1-54	C7653	B277Y9	SO
399-1-54	C7653	B27846	SO
399-1-54	C7653	B27932	SO
399-1-54	C7653	B27934	SO
399-1-54	C7653	B27935	SO
399-1-54	C7653	B282Y0	SO
399-1-54	C7653	B282Y3	SO
399-1-54	C7653	B282Y6	SO
399-1-54	C7653	B282Y9	SO
399-1-54	C7653	B28302	SO
399-1-54	C7653	B28305	SO
399-1-54	C7653	B28307	SO
399-1-54	C7653	B28309	SO
399-1-55	C7654	B27DK7	GW
399-1-55	C7654	B27DK8	GW
399-1-55	C7654	B27DK9	GW
399-1-55	C7654	B27DL0	GW
399-1-55	C7654	B27DL1	GW
399-1-55	C7654	B27DL2	GW
399-1-55	C7654	B27F64	GW
399-1-55	C7654	B276V1	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-1-55	C7654	B27CM6	SO
399-1-55	C7654	B27CM7	SO
399-1-55	C7654	B27CM8	SO
399-1-55	C7654	B27CM9	SO
399-1-55	C7654	B27CN0	SO
399-1-55	C7654	B27CN1	SO
399-1-55	C7654	B27CN2	SO
399-1-55	C7654	B27CN4	SO
399-1-55	C7654	B27CN6	SO
399-1-55	C7654	B27CN7	SO
399-1-55	C7654	B27CN8	SO
399-1-55	C7654	B27CN9	SO
399-1-55	C7654	B27CV4	SO
399-1-55	C7654	B27CV5	SO
399-1-55	C7654	B27CV6	SO
399-1-55	C7654	B27CV7	SO
399-1-55	C7654	B27CV8	SO
399-1-55	C7654	B27CW0	SO
399-1-55	C7654	B27CW1	SO
399-1-55	C7654	B27CW2	SO
399-1-55	C7654	B27CW4	SO
399-1-55	C7654	B27CW5	SO
399-1-55	C7654	B27CW6	SO
399-1-55	C7654	B27CW7	SO
399-1-55	C7654	B27DJ0	SO
399-1-55	C7654	B27DJ1	SO
399-1-55	C7654	B27DJ2	SO
399-1-55	C7654	B27DJ3	SO
399-1-55	C7654	B27DJ4	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-1-55	C7654	B27DL3	SO
399-1-55	C7654	B27DL4	SO
399-1-55	C7654	B27DL5	SO
399-1-55	C7654	B27DL6	SO
399-1-55	C7654	B27DL7	SO
399-1-55	C7654	B27F39	SO
399-1-55	C7654	B27F40	SO
399-1-55	C7654	B27F41	SO
399-1-55	C7654	B27F42	SO
399-1-55	C7654	B27F43	SO
399-1-55	C7654	B27F44	SO
399-1-55	C7654	B27F45	SO
399-1-55	C7654	B27F46	SO
399-1-55	C7654	B27F47	SO
399-1-55	C7654	B27F48	SO
399-1-55	C7654	B27F49	SO
399-1-55	C7654	B27F50	SO
399-1-55	C7654	B27F84	SO
399-1-55	C7654	B27F85	SO
399-1-56	C7655	B27KL6	GW
399-1-56	C7655	B27KL7	GW
399-1-56	C7655	B27KL8	GW
399-1-56	C7655	B27KM0	GW
399-1-56	C7655	B27KM2	GW
399-1-56	C7655	B27K00	SO
399-1-56	C7655	B27K01	SO
399-1-56	C7655	B27K02	SO
399-1-56	C7655	B27K03	SO
399-1-56	C7655	B27K04	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-1-56	C7655	B27K05	SO
399-1-56	C7655	B27K08	SO
399-1-56	C7655	B27K09	SO
399-1-56	C7655	B27K32	SO
399-1-56	C7655	B27K33	SO
399-1-56	C7655	B27K34	SO
399-1-56	C7655	B27K35	SO
399-1-56	C7655	B27K36	SO
399-1-56	C7655	B27K37	SO
399-1-56	C7655	B27K40	SO
399-1-56	C7655	B27K41	SO
399-1-56	C7655	B27K48	SO
399-1-56	C7655	B27K51	SO
399-1-56	C7655	B27K52	SO
399-1-56	C7655	B27K53	SO
399-1-56	C7655	B27K54	SO
399-1-56	C7655	B27K61	SO
399-1-56	C7655	B27K65	SO
399-1-56	C7655	B27K66	SO
399-1-56	C7655	B27K69	SO
399-1-56	C7655	B27K75	SO
399-1-56	C7655	B27KN6	SO
399-1-56	C7655	B27KN7	SO
399-1-56	C7655	B27KN8	SO
399-1-56	C7655	B27KN9	SO
399-1-56	C7655	B27KP0	SO
399-1-56	C7655	B27KP1	SO
399-1-56	C7655	B27KP3	SO
399-1-56	C7655	B27KP4	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-1-57	C7656	B261F2	GW
399-1-57	C7656	B261F3	GW
399-1-57	C7656	B261F4	GW
399-1-57	C7656	B261F5	GW
399-1-57	C7656	B266K5	GW
399-1-57	C7656	B274K8	GW
399-1-57	C7656	B276V3	GW
399-1-57	C7656	B276V4	GW
399-1-57	C7656	B25DM5	SO
399-1-57	C7656	B25DM6	SO
399-1-57	C7656	B25DM7	SO
399-1-57	C7656	B25DM8	SO
399-1-57	C7656	B25DM9	SO
399-1-57	C7656	B25DN0	SO
399-1-57	C7656	B25DN1	SO
399-1-57	C7656	B25DN2	SO
399-1-57	C7656	B25DN3	SO
399-1-57	C7656	B25DN6	SO
399-1-57	C7656	B25DN7	SO
399-1-57	C7656	B25DN8	SO
399-1-57	C7656	B25DN9	SO
399-1-57	C7656	B25DP0	SO
399-1-57	C7656	B25DP1	SO
399-1-57	C7656	B25DP2	SO
399-1-57	C7656	B25DP3	SO
399-1-57	C7656	B25DP4	SO
399-1-57	C7656	B25DV6	SO
399-1-57	C7656	B25DV7	SO
399-1-57	C7656	B25DV8	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-1-57	C7656	B25DV9	SO
399-1-57	C7656	B25DW0	SO
399-1-57	C7656	B261D3	SO
399-1-57	C7656	B261D4	SO
399-1-57	C7656	B261D5	SO
399-1-57	C7656	B261D6	SO
399-1-57	C7656	B261D7	SO
399-1-57	C7656	B261D8	SO
399-1-57	C7656	B276T8	SO
399-1-57	C7656	B276T9	SO
399-1-58	C7657	B27JW9	GW
399-1-58	C7657	B27JX0	GW
399-1-58	C7657	B27JX4	GW
399-1-58	C7657	B27JM3	SO
399-1-58	C7657	B27JM4	SO
399-1-58	C7657	B27JM5	SO
399-1-58	C7657	B27JM7	SO
399-1-58	C7657	B27JM8	SO
399-1-58	C7657	B27JM9	SO
399-1-58	C7657	B27JN0	SO
399-1-58	C7657	B27JN2	SO
399-1-58	C7657	B27JN3	SO
399-1-58	C7657	B27JN4	SO
399-1-58	C7657	B27JN5	SO
399-1-58	C7657	B27JN6	SO
399-1-58	C7657	B27JN7	SO
399-1-58	C7657	B27JN8	SO
399-1-58	C7657	B27JP0	SO
399-1-58	C7657	B27JP1	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-1-58	C7657	B27JP2	SO
399-1-58	C7657	B27JP3	SO
399-1-58	C7657	B27JP5	SO
399-1-58	C7657	B27JP6	SO
399-1-58	C7657	B27JP7	SO
399-1-58	C7657	B27JP8	SO
399-1-58	C7657	B27JP9	SO
399-1-58	C7657	B27JR1	SO
399-1-58	C7657	B27JR2	SO
399-1-58	C7657	B27JR3	SO
399-1-58	C7657	B27JR4	SO
399-1-58	C7657	B27JR7	SO
399-1-58	C7657	B27JT2	SO
399-1-58	C7657	B27JT6	SO
399-1-58	C7657	B27JV0	SO
399-1-58	C7657	B27K77	SO
399-1-58	C7657	B27K78	SO
399-1-58	C7657	B27K79	SO
399-1-58	C7657	B27K80	SO
399-1-58	C7657	B27K81	SO
399-1-58	C7657	B27K82	SO
399-1-58	C7657	B27K83	SO
399-1-58	C7657	B27K84	SO
399-1-58	C7657	B27K86	SO
399-1-58	C7657	B27K87	SO
399-1-58	C7657	B27K88	SO
399-1-58	C7657	B27K89	SO
399-1-58	C7657	B27M29	SO
399-1-58	C7657	B27M30	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-1-58	C7657	B27M31	SO
399-1-58	C7657	B27M32	SO
399-1-59	C7659	B27R60	GW
399-1-59	C7659	B27R61	GW
399-1-59	C7659	B27R62	GW
399-1-59	C7659	B27R63	GW
399-1-59	C7659	B27JW2	SO
399-1-59	C7659	B27JW3	SO
399-1-59	C7659	B27JW5	SO
399-1-59	C7659	B27JW6	SO
399-1-59	C7659	B27JW7	SO
399-1-59	C7659	B27JW8	SO
399-1-59	C7659	B27K59	SO
399-1-59	C7659	B27K60	SO
399-1-59	C7659	B27K63	SO
399-1-59	C7659	B27K64	SO
399-1-59	C7659	B27K68	SO
399-1-59	C7659	B27K74	SO
399-1-59	C7659	B27PY2	SO
399-1-59	C7659	B27PY3	SO
399-1-59	C7659	B27PY4	SO
399-1-59	C7659	B27PY5	SO
399-1-59	C7659	B27R02	SO
399-1-59	C7659	B27R05	SO
399-1-59	C7659	B27R06	SO
399-1-59	C7659	B27R07	SO
399-1-59	C7659	B27R08	SO
399-1-59	C7659	B27R09	SO
399-1-59	C7659	B27R10	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-1-59	C7659	B27R11	SO
399-1-59	C7659	B27R12	SO
399-1-59	C7659	B27R13	SO
399-1-59	C7659	B27R14	SO
399-1-59	C7659	B27R15	SO
399-1-59	C7659	B27R16	SO
399-1-59	C7659	B27R17	SO
399-1-59	C7659	B27R18	SO
399-1-59	C7659	B27R19	SO
399-1-59	C7659	B27R20	SO
399-1-59	C7659	B27R21	SO
399-1-59	C7659	B27R22	SO
399-1-59	C7659	B27R23	SO
399-1-59	C7659	B27R24	SO
399-1-59	C7659	B27R25	SO
399-1-59	C7659	B27R39	SO
399-1-59	C7659	B27R40	SO
399-1-59	C7659	B27R41	SO
399-1-59	C7659	B27R42	SO
399-1-59	C7659	B27R43	SO
399-1-59	C7659	B27R44	SO
399-1-59	C7659	B27R45	SO
399-1-59	C7659	B27R46	SO
399-1-59	C7659	B27R47	SO
399-1-59	C7659	B27R48	SO
399-1-59	C7659	B27R49	SO
399-1-59	C7659	B27R50	SO
399-1-59	C7659	B27R51	SO
399-1-59	C7659	B27R52	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-1-59	C7659	B27R53	SO
399-1-59	C7659	B27R54	SO
399-1-59	C7659	B27R55	SO
399-1-59	C7659	B27R56	SO
399-1-59	C7659	B2B1K0	SO
399-1-59	C7659	B2B1K1	SO
399-1-59	C7659	B2B1L2	SO
399-1-60	C8026	B2CP22	GW
399-1-61	C8026	B296T0	GW
399-1-61	C8026	B296T1	GW
399-1-61	C8026	B296P5	SO
399-1-61	C8026	B296P6	SO
399-1-61	C8026	B296R4	SO
399-1-61	C8026	B296R5	SO
399-1-61	C8026	B296R6	SO
399-1-61	C8026	B296R7	SO
399-1-61	C8026	B2BBB2	SO
399-1-61	C8026	B2BBB3	SO
399-1-62	C8027	B2BBD6	GW
399-1-62	C8027	B2BBD7	GW
399-1-62	C8027	B2BBD2	SO
399-1-62	C8027	B2BBD3	SO
399-1-62	C8027	B2BBD4	SO
399-1-62	C8027	B2BBD5	SO
399-1-63	C8028	B2BBM0	GW
399-1-63	C8028	B2BBM1	GW
399-1-63	C8028	B2BBK9	SO
399-1-63	C8028	B2BBL0	SO
399-1-63	C8028	B2BBL7	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-1-63	C8028	B2BBL9	SO
399-1-64	C8029	B2BCW6	GW
399-1-64	C8029	B2BCW7	GW
399-1-64	C8029	B2BCV9	SO
399-1-64	C8029	B2BCW0	SO
399-1-64	C8029	B2BCW8	SO
399-1-64	C8029	B2BCW9	SO
399-1-64	C8029	B2BCX1	SO
399-2-32	C7660	B27PK9	GW
399-2-32	C7660	B27PL0	GW
399-2-32	C7660	B27PL1	GW
399-2-32	C7660	B27PL2	GW
399-2-32	C7660	B27JR9	SO
399-2-32	C7660	B27JT0	SO
399-2-32	C7660	B27JT5	SO
399-2-32	C7660	B27JT8	SO
399-2-32	C7660	B27JV3	SO
399-2-32	C7660	B27JV4	SO
399-2-32	C7660	B27JV7	SO
399-2-32	C7660	B27PB4	SO
399-2-32	C7660	B27PB5	SO
399-2-32	C7660	B27PB6	SO
399-2-32	C7660	B27PB7	SO
399-2-32	C7660	B27PB8	SO
399-2-32	C7660	B27PB9	SO
399-2-32	C7660	B27PC0	SO
399-2-32	C7660	B27PC1	SO
399-2-32	C7660	B27PC2	SO
399-2-32	C7660	B27PC5	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-2-32	C7660	B27PC7	SO
399-2-32	C7660	B27PC9	SO
399-2-32	C7660	B27PD0	SO
399-2-32	C7660	B27PD1	SO
399-2-32	C7660	B27PD2	SO
399-2-32	C7660	B27PD3	SO
399-2-32	C7660	B27PD7	SO
399-2-32	C7660	B27PH0	SO
399-2-32	C7660	B27PH1	SO
399-2-32	C7660	B27PH2	SO
399-2-32	C7660	B27PH3	SO
399-2-32	C7660	B27PH4	SO
399-2-32	C7660	B27PH5	SO
399-2-32	C7660	B27PH6	SO
399-2-32	C7660	B27PH7	SO
399-2-32	C7660	B27PH8	SO
399-2-32	C7660	B27PJ1	SO
399-2-32	C7660	B27PJ2	SO
399-2-32	C7660	B27PJ3	SO
399-2-32	C7660	B27PJ4	SO
399-2-32	C7660	B27PJ5	SO
399-2-32	C7660	B27PJ6	SO
399-2-32	C7660	B28PN0	SO
399-2-32	C7660	B28PN1	SO
399-2-32	C7660	B28PN2	SO
399-2-32	C7660	B28PN3	SO
399-2-32	C7660	B29NR7	SO
399-2-33	C7663	B2CP23	GW
399-3-33	C7663	B28360	GW

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-3-33	C7663	B28361	GW
399-3-33	C7663	B28362	GW
399-3-33	C7663	B28364	GW
399-3-33	C7663	B25F08	SO
399-3-33	C7663	B25F09	SO
399-3-33	C7663	B25F10	SO
399-3-33	C7663	B25F11	SO
399-3-33	C7663	B25F12	SO
399-3-33	C7663	B25F13	SO
399-3-33	C7663	B25F14	SO
399-3-33	C7663	B25F15	SO
399-3-33	C7663	B25F16	SO
399-3-33	C7663	B25F17	SO
399-3-33	C7663	B25F18	SO
399-3-33	C7663	B25F19	SO
399-3-33	C7663	B25F20	SO
399-3-33	C7663	B25F21	SO
399-3-33	C7663	B25F71	SO
399-3-33	C7663	B25F72	SO
399-3-33	C7663	B25F73	SO
399-3-33	C7663	B25F74	SO
399-3-33	C7663	B25F76	SO
399-3-33	C7663	B25F77	SO
399-3-33	C7663	B25F78	SO
399-3-33	C7663	B282Y1	SO
399-3-33	C7663	B282Y2	SO
399-3-33	C7663	B28303	SO
399-3-33	C7663	B28J86	SO
399-3-33	C7663	B28JB1	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-3-33	C7663	B28MJ2	SO
399-3-33	C7663	B28MJ5	SO
399-3-33	C7663	B28MJ6	SO
399-3-33	C7663	B28MJ9	SO
399-3-33	C7663	B28PY0	SO
399-3-34	C8030	B2CP25	GW
399-3-37	C8030	B2CP24	GW
399-3-38	C8030	B2BCT5	GW
399-3-38	C8030	B2BCT6	GW
399-3-38	C8030	B2BCR4	SO
399-3-38	C8030	B2BCR5	SO
399-3-38	C8030	B2BCR6	SO
399-3-38	C8030	B2BCT1	SO
399-3-38	C8030	B2BCT2	SO
399-3-38	C8030	B2BCT3	SO
399-4-15	C7662	B2B927	GW
399-4-15	C7662	B2B928	GW
399-4-15	C7662	B2B929	GW
399-4-15	C7662	B2B930	GW
399-4-15	C7662	B2B931	GW
399-4-15	C7662	B2B933	GW
399-4-15	C7662	B2B8N6	SO
399-4-15	C7662	B2B8N7	SO
399-4-15	C7662	B2B8N8	SO
399-4-15	C7662	B2B8N9	SO
399-4-15	C7662	B2B8P0	SO
399-4-15	C7662	B2B8P1	SO
399-4-15	C7662	B2B8P2	SO
399-4-15	C7662	B2B8P3	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-4-15	C7662	B2B8P5	SO
399-4-15	C7662	B2B8P6	SO
399-4-15	C7662	B2B8P7	SO
399-4-15	C7662	B2B8P8	SO
399-4-15	C7662	B2B8R5	SO
399-4-15	C7662	B2B8R6	SO
399-4-15	C7662	B2B8R7	SO
399-4-15	C7662	B2B8R8	SO
399-4-15	C7662	B2B8R9	SO
399-4-15	C7662	B2B8T0	SO
399-4-15	C7662	B2B8T1	SO
399-4-15	C7662	B2B8T2	SO
399-4-15	C7662	B2B8T5	SO
399-4-15	C7662	B2B8T6	SO
399-4-15	C7662	B2B8X3	SO
399-4-15	C7662	B2B8X4	SO
399-4-15	C7662	B2B8X5	SO
399-4-15	C7662	B2B8X6	SO
399-4-15	C7662	B2B8X7	SO
399-4-15	C7662	B2B8X8	SO
399-4-15	C7662	B2B8X9	SO
399-4-15	C7662	B2B8Y0	SO
399-4-15	C7662	B2B8Y1	SO
399-4-15	C7662	B2B8Y2	SO
399-4-15	C7662	B2B8Y3	SO
399-4-15	C7662	B2B904	SO
399-4-15	C7662	B2B905	SO
399-4-15	C7662	B2B906	SO
399-4-15	C7662	B2B907	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-4-15	C7662	B2B908	SO
399-4-15	C7662	B2B911	SO
399-4-15	C7662	B2B912	SO
399-4-15	C7662	B2B913	SO
399-4-15	C7662	B2B914	SO
399-4-15	C7662	B2B916	SO
399-4-15	C7662	B2B917	SO
399-4-15	C7662	B2B918	SO
399-4-15	C7662	B2B919	SO
399-4-15	C7662	B2B920	SO
399-4-15	C7662	B2B921	SO
399-4-15	C7662	B2B922	SO
399-4-15	C7662	B2B923	SO
399-4-15	C7662	B2B925	SO
399-4-15	C7662	B2B926	SO
399-4-15	C7662	B2B935	SO
399-4-15	C7662	B2BBN7	SO
399-4-15	C7662	B2BBN9	SO
399-4-15	C7662	B2BBP0	SO
399-4-15	C7662	B2BBP2	SO
399-6-3	C7658	B29FJ4	GW
399-6-3	C7658	B29FJ5	GW
399-6-3	C7658	B29FJ6	GW
399-6-3	C7658	B29FJ8	GW
399-6-3	C7658	B29FD8	SO
399-6-3	C7658	B29FD9	SO
399-6-3	C7658	B29FF0	SO
399-6-3	C7658	B29FF1	SO
399-6-3	C7658	B29FF2	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-6-3	C7658	B29FF3	SO
399-6-3	C7658	B29FJ0	SO
399-6-3	C7658	B29FJ2	SO
399-6-3	C7658	B29FJ3	SO
399-6-3	C7658	B29FT3	SO
399-6-3	C7658	B29FT4	SO
399-6-3	C7658	B29FT5	SO
399-6-3	C7658	B29FT6	SO
399-6-3	C7658	B29FT7	SO
399-6-3	C7658	B29FT8	SO
399-6-3	C7658	B29FT9	SO
399-6-3	C7658	B29FV0	SO
399-6-3	C7658	B29FV2	SO
399-6-3	C7658	B29FV3	SO
399-6-3	C7658	B29FV4	SO
399-6-3	C7658	B29FV5	SO
399-6-3	C7658	B29FV7	SO
399-6-3	C7658	B29FX7	SO
399-6-3	C7658	B29FX8	SO
399-6-3	C7658	B29FX9	SO
399-6-3	C7658	B29FY0	SO
399-6-3	C7658	B29FY1	SO
399-6-3	C7658	B29FY2	SO
399-6-3	C7658	B29FY3	SO
399-6-3	C7658	B29FY4	SO
399-6-3	C7658	B29FY6	SO
399-6-3	C7658	B29FY7	SO
399-6-3	C7658	B29H01	SO
399-6-3	C7658	B29H04	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-6-3	C7658	B29H05	SO
399-6-3	C7658	B29H06	SO
399-6-3	C7658	B29H07	SO
399-6-3	C7658	B29H08	SO
399-6-3	C7658	B29H09	SO
399-6-3	C7658	B29H10	SO
399-6-3	C7658	B29H11	SO
399-6-3	C7658	B29H13	SO
399-6-3	C7658	B29H14	SO
399-6-3	C7658	B29H15	SO
399-6-3	C7658	B29H16	SO
399-6-3	C7658	B29H18	SO
399-6-3	C7658	B29H22	SO
399-6-3	C7658	B29H23	SO
399-6-3	C7658	B29H24	SO
399-6-3	C7658	B29H25	SO
399-6-3	C7658	B29H26	SO
399-6-3	C7658	B29H27	SO
399-6-3	C7658	B29M51	SO
399-6-3	C7658	B29M52	SO
399-6-4	C7661	B29DX1	SO
399-6-4	C7661	B29DX2	SO
399-6-4	C7661	B29DX3	SO
399-6-4	C7661	B29DX4	SO
399-6-4	C7661	B29DX5	SO
399-6-4	C7661	B29DX6	SO
399-6-4	C7661	B29DX7	SO
399-6-4	C7661	B29DX8	SO
399-6-4	C7661	B29F37	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-6-4	C7661	B29F38	SO
399-6-4	C7661	B29F40	SO
399-6-4	C7661	B29F41	SO
399-6-4	C7661	B29F42	SO
399-6-4	C7661	B29F43	SO
399-6-4	C7661	B29F44	SO
399-6-4	C7661	B29F52	SO
399-6-4	C7661	B29F53	SO
399-6-4	C7661	B29F55	SO
399-6-4	C7661	B29F56	SO
399-6-4	C7661	B29F57	SO
399-6-4	C7661	B29F58	SO
399-6-4	C7661	B29F59	SO
399-6-4	C7661	B29F67	SO
399-6-4	C7661	B29F68	SO
399-6-4	C7661	B29F69	SO
399-6-4	C7661	B29F70	SO
399-6-5	C8245	B29DT2	GW
399-6-5	C8245	B29DT3	GW
399-6-5	C8245	B29DT4	GW
399-6-5	C8245	B29DT5	GW
399-6-5	C8245	B29DT6	GW
399-6-5	C8245	B29DP6	SO
399-6-5	C8245	B29DP7	SO
399-6-5	C8245	B29DP8	SO
399-6-5	C8245	B29DP9	SO
399-6-5	C8245	B29DR0	SO
399-6-5	C8245	B29DR1	SO
399-6-5	C8245	B29DR2	SO

Table D-2. Groundwater and Soil Samples Collected during RI Borehole and Well Drilling

Well ID	Well Name	Sample Number	Media
399-6-5	C8245	B29DR3	SO
399-6-5	C8245	B29DR4	SO
399-6-5	C8245	B29DR5	SO
399-6-5	C8245	B29DR6	SO
399-6-5	C8245	B29DR7	SO
399-6-5	C8245	B29DR9	SO
399-6-5	C8245	B29DT0	SO
399-6-5	C8245	B29DT1	SO
399-6-5	C8245	B29DY0	SO
399-6-5	C8245	B29DY1	SO
399-6-5	C8245	B29DY2	SO
399-6-5	C8245	B29DY4	SO
399-6-5	C8245	B29DY5	SO
399-6-5	C8245	B29F45	SO
399-6-5	C8245	B29F46	SO
399-6-5	C8245	B29F48	SO
399-6-5	C8245	B29F49	SO
399-6-5	C8245	B29F60	SO
399-6-5	C8245	B29F61	SO
399-6-5	C8245	B29F63	SO
399-6-5	C8245	B29F64	SO
399-6-5	C8245	B29F71	SO
399-6-5	C8245	B29F72	SO
399-6-5	C8245	B29F73	SO
399-6-5	C8245	B29M01	SO
399-6-5	C8245	B29M03	SO

Table D-3. Wells for Spatial/Temporal Analysis

Well Name	Well Name	Well Name
399-1-10A	399-4-1	699-13-2D
399-1-12	399-4-12	699-13-3A
399-1-17A	399-4-14	699-15-15B
399-1-21A	399-4-9	699-20-E5A
399-1-6	499-S0-7	699-S18-E2B
399-2-1	499-S0-8	699-S19-11
399-2-2	499-S1-8J	699-S28-E0
399-3-12	699-1-18	699-S3-E12
399-3-20	699-12-4D	699-S6-E4A
399-3-6	699-13-1A	699-S8-19
399-3-9	699-13-1E	

Table D-4. 300 Area Sample IDs for Spatial/Temporal Analysis

Well Name	Sample Date	Sample Number
399-1-10A	6/4/2010	B25J93
399-1-10A	6/4/2010	B25M84
399-1-10A	6/4/2010	B25M85
399-1-10A	6/4/2010	B25M87
399-1-10A	6/4/2010	B25M92
399-1-10A	6/4/2010	B25NW1
399-1-10A	6/4/2010	B25NW2
399-1-10A	8/9/2010	B26KK5
399-1-10A	8/9/2010	B26KR8
399-1-10A	8/9/2010	B26KT0
399-1-10A	8/9/2010	B26M61
399-1-10A	8/9/2010	B26M62
399-1-10A	8/9/2010	B26P93
399-1-12	6/6/2010	B25M88

Table D-4. 300 Area Sample IDs for Spatial/Temporal Analysis

Well Name	Sample Date	Sample Number
399-1-12	6/6/2010	B25M89
399-1-12	6/6/2010	B25M91
399-1-12	6/6/2010	B25M93
399-1-12	6/6/2010	B25NX0
399-1-12	6/6/2010	B25NX1
399-1-12	8/9/2010	B26M26
399-1-12	8/9/2010	B26M27
399-1-12	8/9/2010	B26M29
399-1-12	8/9/2010	B26PY6
399-1-17A	6/4/2010	B25LP8
399-1-17A	6/4/2010	B25LP9
399-1-17A	6/4/2010	B25LR1
399-1-17A	6/4/2010	B25M94
399-1-17A	6/4/2010	B25NY2
399-1-17A	6/4/2010	B25NY3
399-1-17A	8/9/2010	B26KL0
399-1-17A	8/9/2010	B26KT8
399-1-17A	8/9/2010	B26M30
399-1-17A	8/9/2010	B26M31
399-1-17A	8/9/2010	B26M32
399-1-17A	8/9/2010	B26M33
399-1-17A	8/9/2010	B26M34
399-1-17A	8/9/2010	B26M35
399-1-17A	8/9/2010	B26PY7
399-1-21A	6/4/2010	B25LR2
399-1-21A	6/4/2010	B25LR3
399-1-21A	6/4/2010	B25LR5
399-1-21A	6/4/2010	B25M95
399-1-21A	6/4/2010	B25P04

Table D-4. 300 Area Sample IDs for Spatial/Temporal Analysis

Well Name	Sample Date	Sample Number
399-1-21A	6/4/2010	B25P05
399-1-21A	8/5/2010	B26KL4
399-1-21A	8/5/2010	B26M37
399-1-21A	8/5/2010	B26M38
399-1-21A	8/5/2010	B26M40
399-1-21A	8/5/2010	B26P96
399-1-6	6/4/2010	B25LR6
399-1-6	6/4/2010	B25LR7
399-1-6	6/4/2010	B25LR9
399-1-6	6/4/2010	B25P13
399-1-6	6/4/2010	B25P14
399-1-6	6/4/2010	B25T53
399-1-6	8/5/2010	B26M41
399-1-6	8/5/2010	B26M42
399-1-6	8/5/2010	B26M44
399-1-6	8/5/2010	B26PY9
399-2-1	6/4/2010	B25LT0
399-2-1	6/4/2010	B25LT1
399-2-1	6/4/2010	B25LT3
399-2-1	6/4/2010	B25TJ6
399-2-1	6/4/2010	B25TJ7
399-2-1	6/4/2010	B25TJ8
399-2-1	8/3/2010	B26M45
399-2-1	8/3/2010	B26M46
399-2-1	8/3/2010	B26M48
399-2-1	8/3/2010	B26R00
399-2-2	6/4/2010	B25LT4
399-2-2	6/4/2010	B25LT5
399-2-2	6/4/2010	B25LT6

Table D-4. 300 Area Sample IDs for Spatial/Temporal Analysis

Well Name	Sample Date	Sample Number
399-2-2	6/4/2010	B25LT7
399-2-2	6/4/2010	B25LT8
399-2-2	6/4/2010	B25LT9
399-2-2	6/4/2010	B25P22
399-2-2	6/4/2010	B25P23
399-2-2	6/4/2010	B25P24
399-2-2	6/4/2010	B25P25
399-2-2	6/4/2010	B25PJ6
399-2-2	6/4/2010	B25T98
399-2-2	8/3/2010	B26M49
399-2-2	8/3/2010	B26M50
399-2-2	8/3/2010	B26M52
399-2-2	8/3/2010	B26R01
399-3-12	6/23/2010	B25LV5
399-3-12	6/23/2010	B25LV6
399-3-12	6/23/2010	B25LV8
399-3-12	6/23/2010	B25P41
399-3-12	6/23/2010	B25P42
399-3-12	6/23/2010	B25T56
399-3-12	8/4/2010	B26M53
399-3-12	8/4/2010	B26M54
399-3-12	8/4/2010	B26M56
399-3-12	8/4/2010	B26R02
399-3-20	6/6/2010	B25LV9
399-3-20	6/6/2010	B25LW0
399-3-20	6/6/2010	B25LW1
399-3-20	6/6/2010	B25P53
399-3-20	6/6/2010	B25P54
399-3-20	6/6/2010	B25TB4

Table D-4. 300 Area Sample IDs for Spatial/Temporal Analysis

Well Name	Sample Date	Sample Number
399-3-20	8/3/2010	B26M57
399-3-20	8/3/2010	B26M58
399-3-20	8/3/2010	B26M60
399-3-20	8/3/2010	B26R03
399-3-6	6/6/2010	B25LW6
399-3-6	6/6/2010	B25LW7
399-3-6	6/6/2010	B25LW9
399-3-6	6/6/2010	B25P65
399-3-6	6/6/2010	B25T60
399-3-6	6/6/2010	B25TK0
399-3-6	8/4/2010	B26M64
399-3-6	8/4/2010	B26M65
399-3-6	8/4/2010	B26M67
399-3-6	8/4/2010	B26R04
399-3-9	6/6/2010	B25LX0
399-3-9	6/6/2010	B25LX1
399-3-9	6/6/2010	B25LX3
399-3-9	6/6/2010	B25P66
399-3-9	6/6/2010	B25P67
399-3-9	6/6/2010	B25T61
399-3-9	8/4/2010	B26M68
399-3-9	8/4/2010	B26M69
399-3-9	8/4/2010	B26M71
399-3-9	8/4/2010	B26R05
399-4-1	6/9/2010	B25LX4
399-4-1	6/9/2010	B25LX5
399-4-1	6/9/2010	B25LX7
399-4-1	6/9/2010	B25P69
399-4-1	6/9/2010	B25P70

Table D-4. 300 Area Sample IDs for Spatial/Temporal Analysis

Well Name	Sample Date	Sample Number
399-4-1	6/9/2010	B25TB6
399-4-1	8/4/2010	B26M72
399-4-1	8/4/2010	B26M73
399-4-1	8/4/2010	B26M75
399-4-1	8/4/2010	B26R06
399-4-12	6/6/2010	B25LX8
399-4-12	6/6/2010	B25LX9
399-4-12	6/6/2010	B25LY1
399-4-12	6/6/2010	B25P78
399-4-12	6/6/2010	B25P79
399-4-12	6/6/2010	B25T65
399-4-12	8/3/2010	B26M76
399-4-12	8/3/2010	B26M77
399-4-12	8/3/2010	B26M79
399-4-12	8/3/2010	B26R07
399-4-14	6/9/2010	B25LY2
399-4-14	6/9/2010	B25LY3
399-4-14	6/9/2010	B25LY5
399-4-14	6/9/2010	B25P81
399-4-14	6/9/2010	B25P82
399-4-14	6/9/2010	B25TB7
399-4-14	8/4/2010	B26KL7
399-4-14	8/4/2010	B26KL8
399-4-14	8/4/2010	B26KM0
399-4-14	8/4/2010	B26M80
399-4-14	8/4/2010	B26M81
399-4-14	8/4/2010	B26P98
399-4-9	6/4/2010	B25LY6
399-4-9	6/4/2010	B25LY7

Table D-4. 300 Area Sample IDs for Spatial/Temporal Analysis

Well Name	Sample Date	Sample Number
399-4-9	6/4/2010	B25LY9
399-4-9	6/4/2010	B25P87
399-4-9	6/4/2010	B25P88
399-4-9	6/4/2010	B25TB8
399-4-9	8/4/2010	B26M83
399-4-9	8/4/2010	B26M84
399-4-9	8/4/2010	B26M86
399-4-9	8/4/2010	B26R08
499-S0-7	7/7/2010	B25M00
499-S0-7	7/7/2010	B25M01
499-S0-7	7/7/2010	B25M03
499-S0-7	7/7/2010	B25M04
499-S0-7	7/7/2010	B25PR6
499-S0-7	7/7/2010	B25PR7
499-S0-7	7/7/2010	B25TB9
499-S0-7	8/11/2010	B26M87
499-S0-7	8/11/2010	B26M88
499-S0-7	8/11/2010	B26M90
499-S0-7	8/11/2010	B26M91
499-S0-7	8/11/2010	B26R09
499-S0-8	7/7/2010	B25M05
499-S0-8	7/7/2010	B25M06
499-S0-8	7/7/2010	B25M08
499-S0-8	7/7/2010	B25M09
499-S0-8	7/7/2010	B25PT0
499-S0-8	7/7/2010	B25PT1
499-S0-8	7/7/2010	B25TC0
499-S0-8	8/11/2010	B26M92
499-S0-8	8/11/2010	B26M93

Table D-4. 300 Area Sample IDs for Spatial/Temporal Analysis

Well Name	Sample Date	Sample Number
499-S0-8	8/11/2010	B26M95
499-S0-8	8/11/2010	B26M96
499-S0-8	8/11/2010	B26R10
499-S1-8J	7/7/2010	B25M10
499-S1-8J	7/7/2010	B25M11
499-S1-8J	7/7/2010	B25M13
499-S1-8J	7/7/2010	B25M14
499-S1-8J	7/7/2010	B25PT4
499-S1-8J	7/7/2010	B25PT5
499-S1-8J	7/7/2010	B25TC1
499-S1-8J	8/11/2010	B26M97
499-S1-8J	8/11/2010	B26M98
499-S1-8J	8/11/2010	B26MB0
499-S1-8J	8/11/2010	B26MB1
499-S1-8J	8/11/2010	B26R11
699-1-18	6/10/2010	B25M15
699-1-18	6/10/2010	B25M16
699-1-18	6/10/2010	B25M18
699-1-18	6/10/2010	B25M19
699-1-18	6/10/2010	B25M96
699-1-18	8/2/2010	B26MB2
699-1-18	8/2/2010	B26MB3
699-1-18	8/2/2010	B26MB5
699-1-18	8/2/2010	B26MB6
699-1-18	8/2/2010	B26R12
699-12-4D	6/10/2010	B25M20
699-12-4D	6/10/2010	B25M21
699-12-4D	6/10/2010	B25M23
699-12-4D	6/10/2010	B25PT9

Table D-4. 300 Area Sample IDs for Spatial/Temporal Analysis

Well Name	Sample Date	Sample Number
699-12-4D	6/10/2010	B25PV0
699-12-4D	6/10/2010	B262R9
699-12-4D	9/2/2010	B26MB7
699-12-4D	9/2/2010	B26MB8
699-12-4D	9/2/2010	B26MC0
699-12-4D	9/2/2010	B26MC1
699-12-4D	9/2/2010	B26R13
699-13-1A	6/23/2010	B25M24
699-13-1A	6/23/2010	B25M25
699-13-1A	6/23/2010	B25M27
699-13-1A	6/23/2010	B25M28
699-13-1A	6/23/2010	B25PT3
699-13-1A	6/23/2010	B25PT7
699-13-1A	6/23/2010	B262R8
699-13-1A	9/19/2010	B26MC2
699-13-1A	9/19/2010	B26MC3
699-13-1A	9/19/2010	B26MC5
699-13-1A	9/19/2010	B26MC6
699-13-1A	9/19/2010	B26R14
699-13-1E	6/10/2010	B25M29
699-13-1E	6/10/2010	B25M30
699-13-1E	6/10/2010	B25M32
699-13-1E	6/10/2010	B25M33
699-13-1E	6/10/2010	B25NT9
699-13-1E	6/10/2010	B25NV0
699-13-1E	6/10/2010	B25TC2
699-13-1E	8/12/2010	B26MC7
699-13-1E	8/12/2010	B26MC8
699-13-1E	8/12/2010	B26MD0

Table D-4. 300 Area Sample IDs for Spatial/Temporal Analysis

Well Name	Sample Date	Sample Number
699-13-1E	8/12/2010	B26MD1
699-13-1E	8/12/2010	B26R15
699-13-2D	6/10/2010	B25M34
699-13-2D	6/10/2010	B25M35
699-13-2D	6/10/2010	B25M37
699-13-2D	6/10/2010	B25M38
699-13-2D	6/10/2010	B25NV2
699-13-2D	6/10/2010	B25NV3
699-13-2D	6/10/2010	B25TC3
699-13-2D	8/12/2010	B26KM2
699-13-2D	8/12/2010	B26MD2
699-13-2D	8/12/2010	B26MD3
699-13-2D	8/12/2010	B26MD5
699-13-2D	8/12/2010	B26MD6
699-13-2D	8/12/2010	B26R16
699-13-3A	6/10/2010	B25M39
699-13-3A	6/10/2010	B25M40
699-13-3A	6/10/2010	B25M42
699-13-3A	6/10/2010	B25M43
699-13-3A	6/10/2010	B25NV5
699-13-3A	6/10/2010	B25NV6
699-13-3A	6/10/2010	B25TC4
699-13-3A	8/12/2010	B26KM4
699-13-3A	8/12/2010	B26MD7
699-13-3A	8/12/2010	B26MD8
699-13-3A	8/12/2010	B26MF0
699-13-3A	8/12/2010	B26MF1
699-13-3A	8/12/2010	B26R17
699-15-15B	6/10/2010	B25M44

Table D-4. 300 Area Sample IDs for Spatial/Temporal Analysis

Well Name	Sample Date	Sample Number
699-15-15B	6/10/2010	B25M45
699-15-15B	6/10/2010	B25M47
699-15-15B	6/10/2010	B25M48
699-15-15B	6/10/2010	B25NF0
699-15-15B	8/4/2010	B26MF2
699-15-15B	8/4/2010	B26MF3
699-15-15B	8/4/2010	B26MF5
699-15-15B	8/4/2010	B26MF6
699-15-15B	8/4/2010	B26R18
699-20-E5A	4/27/2010	B24N22
699-20-E5A	4/27/2010	B24NN9
699-20-E5A	4/27/2010	B25019
699-20-E5A	4/27/2010	B25020
699-20-E5A	4/27/2010	B25021
699-20-E5A	4/27/2010	B25022
699-20-E5A	4/27/2010	B25027
699-20-E5A	4/27/2010	B25028
699-20-E5A	4/27/2010	B25029
699-20-E5A	4/27/2010	B25030
699-20-E5A	6/10/2010	B25FJ7
699-20-E5A	6/10/2010	B25FJ8
699-20-E5A	6/10/2010	B25M49
699-20-E5A	6/10/2010	B25M50
699-20-E5A	6/10/2010	B25M52
699-20-E5A	6/10/2010	B25M53
699-20-E5A	6/10/2010	B25M97
699-20-E5A	6/10/2010	B25NF5
699-20-E5A	6/10/2010	B25NF6
699-20-E5A	6/10/2010	B25NF7

Table D-4. 300 Area Sample IDs for Spatial/Temporal Analysis

Well Name	Sample Date	Sample Number
699-20-E5A	6/10/2010	B25NF8
699-20-E5A	9/1/2010	B26M14
699-20-E5A	9/1/2010	B26M15
699-20-E5A	9/1/2010	B26M16
699-20-E5A	9/1/2010	B26M18
699-20-E5A	9/1/2010	B26MF8
699-20-E5A	9/1/2010	B26MF9
699-20-E5A	9/1/2010	B26NF1
699-20-E5A	9/1/2010	B26NF5
699-20-E5A	9/1/2010	B26NF6
699-S18-E2B	8/29/2010	B25M54
699-S18-E2B	8/29/2010	B25M55
699-S18-E2B	8/26/2010	B25M57
699-S18-E2B	8/26/2010	B25M58
699-S18-E2B	8/29/2010	B25M98
699-S18-E2B	9/19/2010	B26MH0
699-S18-E2B	9/19/2010	B26MH1
699-S18-E2B	9/19/2010	B26MH3
699-S18-E2B	9/19/2010	B26MH4
699-S18-E2B	9/19/2010	B26R19
699-S19-11	6/23/2010	B25M59
699-S19-11	6/23/2010	B25M60
699-S19-11	6/23/2010	B25M62
699-S19-11	6/23/2010	B25M63
699-S19-11	6/23/2010	B25M99
699-S19-11	8/2/2010	B26MH5
699-S19-11	8/2/2010	B26MH6
699-S19-11	8/2/2010	B26MH8
699-S19-11	8/2/2010	B26MH9

Table D-4. 300 Area Sample IDs for Spatial/Temporal Analysis

Well Name	Sample Date	Sample Number
699-S19-11	8/2/2010	B26R20
699-S28-E0	6/10/2010	B25M64
699-S28-E0	6/10/2010	B25M65
699-S28-E0	6/10/2010	B25M67
699-S28-E0	6/10/2010	B25M68
699-S28-E0	6/10/2010	B25MB0
699-S28-E0	8/2/2010	B26MJ0
699-S28-E0	8/2/2010	B26MJ1
699-S28-E0	8/2/2010	B26MJ3
699-S28-E0	8/2/2010	B26MJ4
699-S28-E0	8/2/2010	B26R21
699-S3-E12	6/10/2010	B25M69
699-S3-E12	6/10/2010	B25M70
699-S3-E12	6/10/2010	B25M72
699-S3-E12	6/10/2010	B25M73
699-S3-E12	6/10/2010	B25TK6
699-S3-E12	6/10/2010	B25TK7
699-S3-E12	6/10/2010	B25TK8
699-S3-E12	6/10/2010	B25TK9
699-S3-E12	8/2/2010	B26MJ5
699-S3-E12	8/2/2010	B26MJ6
699-S3-E12	8/2/2010	B26MJ8
699-S3-E12	8/2/2010	B26MJ9
699-S3-E12	8/2/2010	B26R22
699-S6-E4A	6/14/2010	B25M74
699-S6-E4A	6/14/2010	B25M75
699-S6-E4A	6/14/2010	B25M82
699-S6-E4A	6/14/2010	B25M83
699-S6-E4A	6/14/2010	B25MB1

Table D-4. 300 Area Sample IDs for Spatial/Temporal Analysis

Well Name	Sample Date	Sample Number
699-S6-E4A	6/14/2010	B25PB5
699-S6-E4A	6/14/2010	B25PB6
699-S6-E4A	8/2/2010	B26KM5
699-S6-E4A	8/2/2010	B26MK0
699-S6-E4A	8/2/2010	B26MK1
699-S6-E4A	8/2/2010	B26MK2
699-S6-E4A	8/2/2010	B26MK4
699-S6-E4A	8/2/2010	B26P99
699-S8-19	6/10/2010	B25M77
699-S8-19	6/10/2010	B25M78
699-S8-19	6/10/2010	B25M79
699-S8-19	6/10/2010	B25M80
699-S8-19	6/10/2010	B25PV6
699-S8-19	6/10/2010	B25TK4
699-S8-19	8/2/2010	B26MK9
699-S8-19	8/2/2010	B26ML0
699-S8-19	8/2/2010	B26ML2
699-S8-19	8/2/2010	B26ML3
699-S8-19	8/2/2010	B26R23

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Attachment D1

Data Quality Assessment for 300-FF-5 Operable Unit Remedial Investigation Data

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Terms

ARAR	applicable or relevant and appropriate requirement
AQA	Analytical Quality Associates, Inc.
CAS	Chemical Abstracts Service
CCC	criterion continuous concentration
COC	contaminant of concern
COPCs	contaminants of potential concern
CRDL	contract required detection limit
DQA	data quality assessment
DOE	U.S. Department of Energy
DUP	field duplicate samples
EB	equipment rinsate
EPA	U.S. Environmental Protection Agency
FTB	full trip blank
FXR	field transfer blank
GEA	gamma energy analysis
GC/MS	gas chromatograph/mass spectrometer
HEIS	Hanford Environmental Information System
IC	ion chromatography
ICP	inductively coupled plasma
IFRC	Integrated Field Research Center
KPA	kinetic phosphorescence analysis
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LSC	liquid scintillation counter
MCL	maximum contaminant level
MDA	minimum detectable activity
MDL	method detection limit
MS	mass spectrometry
MS	matrix spike

MSD	matrix spike duplicate
N/A	not applicable
NTU	nephelometric turbidity unit
NV	no value
OU	Operable Unit
QA/QC	quality assurance/quality control
QC	quality control
QL	quantitation limit
RAO	remedial action objective
RDR	Request for Data Review
RESRAD	RESidual RADioactivity (dose model)
REDOX	Reduction Oxidation (Plant or process)
RI	remedial investigation
RL	Reporting Limit
ROD	Record of Decision
RPDs	relative percent differences
RI/FS	Remedial Investigation/Feasibility Study
SAP	Sampling and Analysis Plan
SDG	sample delivery group
SHAW	SHAW Laboratory
SVOA	semivolatile organic analysis
SVOCs	semi-volatile organic compounds
TARL	Test America, Richland
TASL	Test America, St. Louis
UKPA	total uranium by kinetic phosphorescence analysis
VOA	volatile organic analysis
VOC	volatile organic compound
Wetchem	a group of analytical methods which don't use instrumentation but are associated with "wet" chemical reactions
WSCF	Waste Sampling and Characterization Facility

D1 Introduction

This data quality assessment (DQA) report evaluates laboratory data for aquifer sediment and groundwater samples collected as part of the Remedial Investigation (RI) for the 300-FF-5 Operable Unit (OU). The purpose of this DQA is to determine whether these data are the right type and of sufficient quality and quantity to support remedial action decisions. The information contained in this report follows guidelines for DQAs established by the Soil and Groundwater Remediation Project. These guidelines are based on the U.S. Environmental Protection Agency (EPA) guide *Data Quality Assessment: A Reviewer's Guide* (EPA/240/B-06/002).

The RI for the 300-FF-5 OU included drilling and sampling 16 characterization boreholes in the 300 Area Industrial Complex and completing those boreholes as groundwater monitoring wells. During drilling, aquifer sediment and groundwater samples were collected for laboratory analysis. Figure 1-1 shows the locations of the 16 characterization boreholes. In addition, groundwater samples were collected from 32 existing groundwater wells for laboratory analysis to support a spatial and temporal evaluation of groundwater contamination. Figure 1-2 shows the locations of the 32 existing wells. Sample collection and analysis were performed in accordance with *300 Area Remedial Investigation/Feasibility Study Sampling and Analysis Plan for the 300-FF-1, 300-FF-2 and 300-FF-5 Operable Units* (DOE/RL-2009-45), hereinafter called the 300 Area SAP. Details regarding site and project background and history are provided in *300 Area Remedial Investigation/Feasibility Study Work Plan for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units* (DOE/RL-2009-30), hereinafter called the 300 Area RI/FS Work Plan.

D1.1 Laboratory Information

The samples collected were analyzed at the following laboratories:

- Waste Sampling and Characterization Facility (WSCF) Analytical Laboratory performed chemical and radiological analyses on selected soil and groundwater samples. WSCF is located on the Hanford Site and is operated by the Mission Support Alliance for the U.S. Department of Energy, Richland Operations Office.
- Test America, Richland (TARL), located in Richland, Washington, performed chemical and radionuclide analyses on selected soil and groundwater samples.
- Test America, St. Louis (TASL), located in St. Louis, Missouri, performed chemical analyses on selected soil and groundwater samples.
- Lionville Laboratory, located in Exton, Pennsylvania, performed chemical analyses on selected soil and groundwater samples.
- SHAW Laboratory (SHAW), located in Knoxville, Tennessee, performed physical properties testing on selected soil samples.

Sections 7, 8, and 9 discuss the analytical data provided by these laboratories.

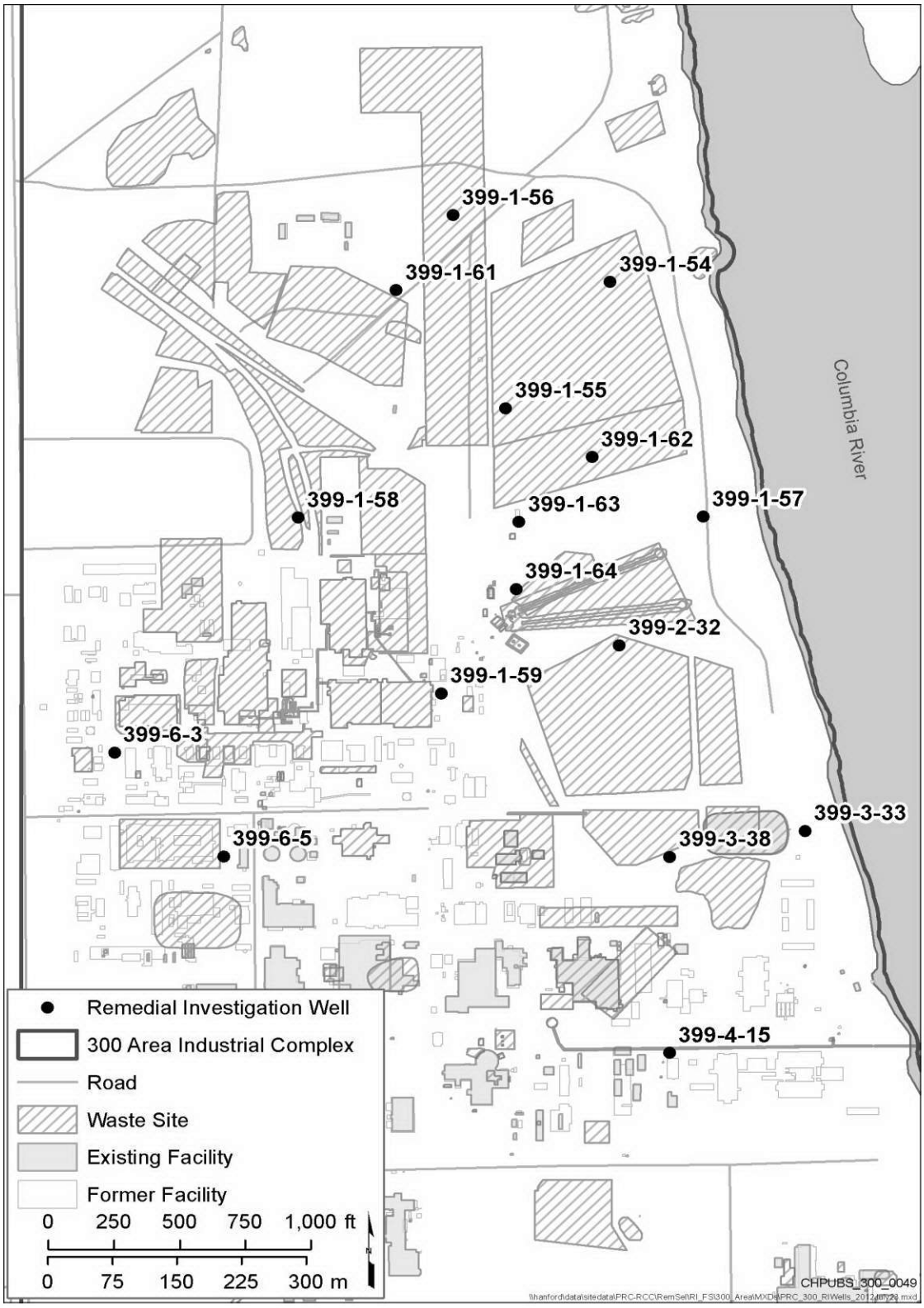

Figure1-1. Locations of 16 Characterization Boreholes Sampled for the 300-FF-5 OU Remedial Investigation

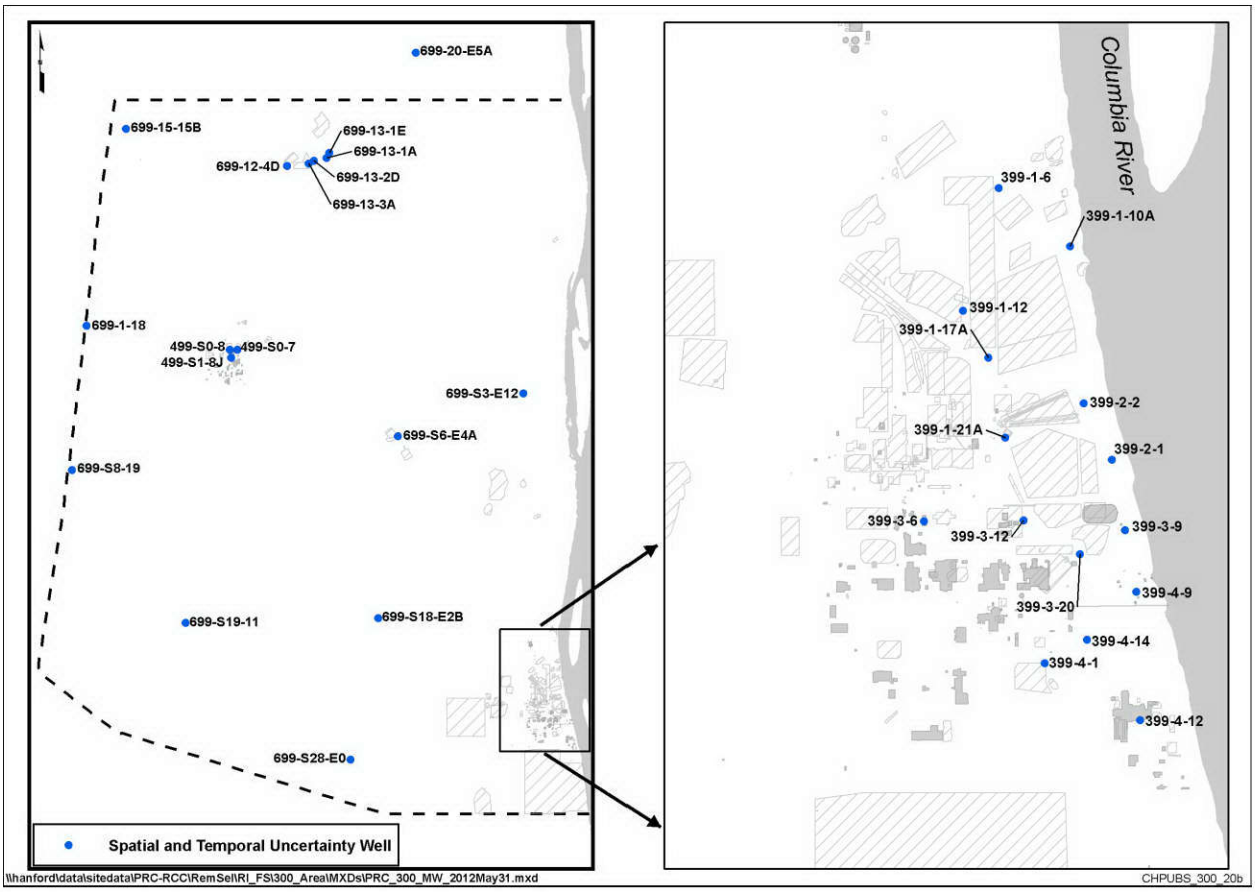

Figure 1-2. Locations of 32 Existing Wells Sampled for the 300-FF-5 OU Remedial Investigation

D1.2 Analytical Methods

Samples were analyzed using methods listed in Table 1-1. Both multi-component and single-component method-based analyses were used. Multi-component method-based analyses are those analyses typically based upon EPA methods, as applicable, which yield concentration data for multiple analytes in a single analysis. The analytes may include both target analytes and non-target analytes. Single-component method-based analyses are those analyses typically based upon EPA methods, as applicable, which yield concentration data for a single target analyte in a single analysis. Sample results were reported in the Hanford Environmental Information System (HEIS) database. In addition, tentatively identified volatile organic compounds (VOCs) were reported for *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final Update IV-B* (SW-846), Method 8260.

Table 1-1. Analytical Methods

Parameter	Analytical Method
ICP Metals	EPA Method 6010
ICP/MS Metals	EPA Method 200.8 or 6020
Mercury	EPA Method 200.8, 7470 (water), or 7471 (soil)

Table 1-1. Analytical Methods

Parameter	Analytical Method
Uranium	ICP-MS, KPA
Anions	EPA Method 300.0
Volatile Organic Compounds (VOCs)	EPA Method 8260
Semivolatile Organic Compounds (SVOCs)	EPA Method 8270
Total Carbon	Carbon Dioxide Coulometer
Total Inorganic Carbon	Carbon Dioxide Coulometer
Strontium-89/90	Gas-Flow Proportional Counting
Tritium	LSC – Tritium
Uranium – 233/234	Isotopic - Uranium
Uranium – 238	Isotopic - Uranium

For EPA Method 300.0, see EPA/600/R-93/100 *Methods for the Determination of Inorganic Substances in Environmental Samples*. For EPA Method 200.8, see EPA-600/R-94/111, *Methods for the Determination of Metals in Environmental Samples, Supplement I*. For the four-digit EPA methods, see SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final Update IV-B*.

ICP = inductively coupled plasma
LSC = liquid scintillation counter
MS = mass spectrometry
KPA = kinetic phosphorescence analysis

D2 Purpose

The purpose of the remedial investigation was to collect aquifer sediment and groundwater samples at the 300-FF-5 OU to determine the nature and extent of contamination, to fill data gaps to support development of a conceptual site model, to support development of risk assessment models, and to support selection of remedial alternatives. The samples were collected and analyzed in accordance with the 300 Area SAP (DOE/RL-2009-45) to fill the data needs outlined in the 300 Area RI/FS Work Plan (DOE/RL-2009-30).

The DQA process assesses the quality of the data collected to determine whether the data are the right type and of sufficient quality and quantity for regulatory use (i.e., remedial decision making). This DQA completes the EPA data quality life cycle (planning, implementation, and assessment).

D3 Scope

The DQA process involves the scientific evaluation of data to determine whether the data are of the right type, quality, and quantity to support their intended use. The DQA process is not intended to be a definitive analysis of a project or problem. Rather, it provides an initial assessment of the reasonableness of the data that have been generated, based solely on the quality control (QC) information associated with the data, not upon the technical interpretations of the data values. This DQA focuses on the chemical and

radiological characterization data collected by sampling saturated soil and groundwater at 300-FF-5 OU as required by the 300 Area SAP (DOE/RL-2009-45). The data are evaluated to determine whether they meet the analytical criteria outlined in the SAP and are adequate to support decision making. Evaluation of geophysical logging data is not part of this DQA scope. The data quality assessment of physical properties data is also not part of the scope of this report.

This DQA was performed in accordance with guidelines for DQAs established by the Soil and Groundwater Remediation Project. These guidelines are based upon *Data Quality Assessment, A Reviewer's Guide* (EPA/240/B-06/002). The DQA methodology includes data verification, data validation, and data usability evaluations.

D3.1 Data Verification

Data verification is the process of evaluating the completeness, correctness, and conformance/compliance of a specific data set against the method, procedural, or contractual requirements. It includes confirmation that the specified sampling and analytical requirements have been completed (i.e., verification that the number, type, and location of all samples identified in the SAP have been collected and that all required measurements and analyses were performed). This evaluation is documented in the completeness section (Section 5.2), which evaluates the sampling design versus field implementation. In addition, verification is performed for field QC and laboratory QC samples and is documented in the field QC and laboratory QC sections (Sections 8 and 9, respectively).

D3.2 Data Validation

Data validation is an analyte- and sample- specific process that extends the evaluation of data beyond method, procedural, or contractual compliance (i.e., data verification) to determine the analytical quality of a specific data set, typically data in single analytical batches. Data validation is an independent assessment to ensure that the reliability of data is known by the user. Analytical data validation provides a level of assurance, based on technical evaluation, that an analyte is either present or absent. Validation might include verification of required deliverables (e.g., the minimum detection limits); verification of instrument calibrations; evaluation of analytical results based on method blanks, recovery of various internal standards, correctness of uncertainty calculations, the identification and quantification of analytes, and the effect of quality deficiencies on the analytical sample data. Third party validation was performed on a percentage of all project data and is described in Section 7.3.

D3.3 Data Usability

The data usability assessment is a determination of the adequacy of the data to support a particular environmental decision and is based upon the verification and validation results. The assessment relates to the adequacy of data to support a specific and defined data need. The usability step involves assessing whether the samples collected and the resulting analytical data meet project quality objectives. This evaluation is summarized in the Data Usability section (Section 10).

D4 Project Objectives

The data needs as described in the 300 Area RI/FS Work Plan (DOE/RL-2009-30) that involve samples of groundwater and saturated sediment collected during RI drilling are shown in Table 4-1. The individual data needs are identified by grouping (e.g., contaminant source, distribution, fate and transport) and by geographic area (e.g., 300 Area Industrial Complex). Laboratory analytical results for these samples have been evaluated as part of this DQA. Table 4-1 presents brief summaries for the scope of work and

justification (i.e., data gap being filled) for the individual data needs as developed during the work planning process.

Table 4-1. Summary of Data Needs for 300 Area Groundwater and Saturated Sediment Sampling

Data Need[a,b]	Scope of Work	Justification (Data Gap)
Data Need No. 3 (Source-300 Area IC) Sediment and water samples from the subsurface zone affected by Columbia River water; determination of the contaminant uranium inventory and laboratory tests to reveal the mobility characteristics of that uranium.	Drill two boreholes near the Columbia River where groundwater interacts with river water. Collect sediment and water samples to determine contaminant content and contaminant mobility characteristics at various depths in the vadose zone and aquifer.	Contaminant uranium could potentially sequester on sediment near the Columbia River because of river-induced geochemical condition changes. The magnitude of this phenomenon and its potential to act as a continuing source for resupplying the groundwater plume has not been determined.
Data Need No. 8 (Source-300 Area IC) Analyses of vadose zone sediment samples from borehole locations away from the footprints of principal liquid waste disposal sites will be used to refine estimates for the distribution of contaminant uranium.	Drill five boreholes in the western and southwestern portions of the plume. Collect sediment and water samples to determine contaminant content and contaminant mobility characteristics at various depths in the vadose zone and aquifer. Data from boreholes 6 and 7 will also contribute to resolving this data need, as will information from the five temporary transect wells (a) to (e) from Data Need 2.	Data to describe the lateral distribution of uranium in the deeper portion of the vadose zone away from remediated waste sites are very limited. The information available is based primarily on an understanding of historical conditions during the fuel fabrication years, and not on direct observation from characterization boreholes.
Data Need No. 10 (Distribution-300 Area IC) Fill coverage gaps in the groundwater monitoring network for the uranium plume by completing monitoring wells at each of the 11 characterization borehole sites.	Complete each of the 11 characterization boreholes as a groundwater monitoring well. Unless unexpected conditions are encountered during characterization, well screens will be positioned to monitor the uppermost hydrologic unit (i.e., saturated Hanford formation sediment). New wells include two in the North Process Pond, one in the South Process Pond, one in 300 Area Process Trenches, five in the western and southwestern portions of the uranium plume, and two near the Columbia River. Conduct quarterly sampling of each new monitoring well for the first year, with a reduction in frequency for subsequent years, if warranted.	Monitoring well coverage of the hydrologic unit presumed to contain the bulk of uranium contamination is uneven, with principal weaknesses in coverage at the footprints of former liquid waste disposal sites and near the perimeter of the plume, especially the western and southwestern portions.

Table 4-1. Summary of Data Needs for 300 Area Groundwater and Saturated Sediment Sampling

Data Need[a,b]	Scope of Work	Justification (Data Gap)
Data Need No. 11 (Distribution-300 Area IC) Additional field observations of water quality in groundwater from the lower portion of the unconfined aquifer near Well 399-1-16B, particularly upgradient from the well and within the flow path from potential sources.	Collect groundwater samples for volatile organic compound (VOC) analysis during characterization borehole drilling at locations 8 and 9 (North Process Pond), location 10 (300 Area Process Trenches), and location 6 (a near-river site east of the former sanitary leach trenches) from depths that reach a comparable hydrologic unit in the unconfined aquifer as at Well 399-1-16B.	The extent of VOC contamination to the north and northwest of Well 399-1-16B is not clearly defined by the current monitoring well network.
Data Need No. 17 (Fate and Transport-300 Area IC) Update inventory box model and investigate how the inventory might vary under the influence of seasonal groundwater conditions.	Collect groundwater samples from the water table during periods of high water table conditions, along with additional samples from discrete depths below the water table.	Current inventory estimates of contaminant uranium in the vadose zone and aquifer are based on limited observational data and include numerous assumptions and inferences. The estimates can be refined by incorporating new information from sampling at remedial action sites, research activities at the Integrated Field Research Center (IFRC), and characterization associated with treatability testing sites.
Data Need No. 20 (Fate and Transport-300 Area IC) Additional geochemical and microbiological data for groundwater samples, including oxygen levels, organic carbon, and nutrients from the contaminated interval at Well 399-1-16B.	Continue to collect and analyze groundwater samples from the deeper portion of the unconfined aquifer near Well 399-1-16B (and any newly constructed wells that have open intervals in the hydrologic unit that is continuous with Well 399-1-16B), according to the objectives described in *Operation and Maintenance Plan for the 300-FF-5 Operable Unit* (DOE/RL-95-73) for characterizing VOC contamination and trends.	The cause of the persistence of cis-1,2-dichloroethene contamination in the lower portion of the unconfined aquifer at Well 399-1-16B is uncertain.

Table 4-1. Summary of Data Needs for 300 Area Groundwater and Saturated Sediment Sampling

Data Need[a,b]	Scope of Work	Justification (Data Gap)
Data Need No. 33 (Distribution-600 Area) Groundwater samples from a subset of wells selected to provide representative samples of aquifer conditions throughout the 300 Area; laboratory analysis of the samples to include contaminants of potential concern (COPCs) as identified in Section 4.5.2 of the Work Plan; and multiple rounds of sampling to characterize the temporal variability in aquifer conditions.	Collect groundwater samples from a subset of 300 Decision Area groundwater monitoring wells to (1) spatially represent current conditions, (2) collect samples from those wells during at least three rounds of sampling that encompass seasonal variability in water table and Columbia River conditions, and (3) analyze those samples for constituents deemed to be of potential concern for human and ecological receptors.	Existing groundwater datasets and the strategies currently in place to monitor groundwater conditions do not meet the remedial investigation (RI) needs for determining spatial and temporal risk uncertainty for potential human and ecological receptors.

a. Data needs are from DOE/RL-2009-30, *300 Area Decision Unit Remedial Investigation/Feasibility Study Work Plan for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units* (Table 3-4).

b. Batch leach analyses, physical properties results, and multiple uranium extractions results were not evaluated as part of this Data Quality Assessment (DQA).

D5 Completeness

D5.1 Sampling Design

Groundwater and saturated sediment sampling conducted under the 300 Area RI/FS Work Plan (DOE/RL-2009-30) and associated 300 Area SAP (DOE/RL-2009-45) were performed in support of three principal groups of activities: (1) full characterization of vadose zone and unconfined aquifer contaminant conditions at eleven borehole locations chosen to be representative of various subsurface environments, (2) abbreviated characterization of the lower portion of the vadose zone and uppermost portion of the unconfined aquifer at five locations that form transects at increasing distances from the principal liquid waste disposal facilities, and (3) spatial and temporal groundwater sampling at established monitoring wells to conduct a risk assessment. Table 5-1 summarizes the sampling and analysis design adopted for the 300 Area SAP (DOE/RL-2009-45) for each of the three activities groupings.

D5.2 Implementation of the Sample Design

Two borehole summary reports were prepared that document the field activities conducted as part of the characterization of the vadose zone and unconfined aquifer for the 16 new RI wells within the 300 Area Industrial Complex (*Borehole Summary Report for the Installation of Eleven Wells to Support RI/FS in the 300-FF-5 Operable Unit* [SGW-50054]; *Borehole Summary Report For The Installation Of Five Wells In The 300-FF-5 Operable Unit To Support RI/FS In FY 2011* [SGW-50087]).

Saturated sediment and groundwater samples were collected for analysis of the COPCs identified in Tables 1-3 and 1-4 of the 300 Area SAP (DOE/RL-2009-45). The scope of the activities performed included the following:

- Remedial investigation well drilling, sediment and groundwater sampling, and well completion and development for 16 new groundwater wells
- Low, transition, and high river stage sampling of 32 existing groundwater monitoring wells

Table 5-2 is a summary of the saturated sediment and groundwater sampling performed for the 300 Area RI/FS. In general, the sampling design was implemented as described in the 300 Area SAP (DOE/RL-2009-45). Minor exceptions occurred based on actual conditions encountered during drilling. Table 5-3 is a summary of the groundwater sampling performed for the spatial and temporary uncertainty monitoring.

Table 5-1. Summary of 300 Area RI/FS Sampling and Analysis Design

Planned Characterization and Analytical Methodologies	Key Features of Sampling and Analysis as Presented in the 300 Area RI/FS Work Plan (DOE/RL-2009-30), Table 3-5, and Sampling and Analysis Plan (DOE/RL-2009-45), Table 3-2
Full Characterization Boreholes: Eleven Locations	
Geologic Archive Sediment Samples	During drilling, take grab samples representing major formations and where significant changes in lithology occur, at intervals specified in the Sampling and Analysis Plan (SAP).
Sediment Sampling: Vadose Zone, Periodically Rewetted Zone, and Unconfined Aquifer	During drilling, take split spoon (i.e., core) samples at approximate 3 m (10 ft) intervals starting below either the bottom of the waste site, maximum depth of remedial action, or historical high water table elevation; at 1 m (3 ft) intervals after a depth of 9 m (30 ft) below ground surface; continuous sampling within 3 m (10 ft) of the water table; and 1 m (3 ft) intervals from the top of the water table through the saturated Hanford formation. At each location, at least two samples are from the saturated Hanford formation. For samples from above the water table, analyses include all constituents listed as contaminants of potential concern (COPCs) in the Work Plan*, and batch leach tests to reveal exchange rates between solid and dissolved forms of metals. For samples from below the water table, perform leach tests involving sequential extractions of uranium. Physical properties bulk density, grain size distribution, and soil moisture content will be determined for samples collected by split spoon (i.e., coring method).
Groundwater Sampling	During drilling, samples to be collected from the top, middle, and bottom of the unconfined aquifer and as necessary at geology changes (in particular, supplemental samples will be collected from water-yielding fine-grain intervals that will be targeted). Samples will be filtered as required. Laboratory analysis of groundwater includes major anions and cations (metals), radiological indicators, uranium, and other general water quality parameters.

Table 5-1. Summary of 300 Area RI/FS Sampling and Analysis Design

Planned Characterization and Analytical Methodologies	Key Features of Sampling and Analysis as Presented in the 300 Area RI/FS Work Plan (DOE/RL-2009-30), Table 3-5, and Sampling and Analysis Plan (DOE/RL-2009-45), Table 3-2
Abbreviated Characterization Transect Boreholes: Five Locations	
Geologic Archive Sediment Samples	During drilling, take grab samples representing major formations and where significant changes in lithology occur, at intervals specified in the SAP.
Sediment Sampling: Vadose Zone and Periodically Rewetted Zone	Collect sediment samples every 0.8 m (2.5 ft) starting at 3 m (10 ft) above the estimate for the water table, with at least one sample from the zone always saturated; that is, lowest water table elevation. Laboratory analysis of sediment includes sequential leaching methods to extract uranium.
Groundwater Sampling	Collect one sample when saturated conditions are encountered. Laboratory analysis of groundwater includes major anions and cations (metals), radiological indicators, uranium, and other general water quality parameters.
Groundwater Data for Spatial and Temporal Risk Assessment: Thirty-Three Wells	
Groundwater Sampling	Three sampling events to capture aquifer conditions during Columbia River seasonal stages representing “high,” “transition,” and “low” conditions. Laboratory analyses to cover contaminants of potential concern listed in Tables 1-4 and 1-5 of DOE/RL-2009-45.

Sources: DOE/RL-2009-30, *300 Area Decision Unit Remedial Investigation/Feasibility Study Work Plan for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units*.

DOE/RL-2009-45, *300 Area Remedial Investigation/Feasibility Study Sampling and Analysis Plan for the 300-FF-1, 300-FF-2 and 300-FF-5 Operable Units*.

* DOE/RL-2009-30, Tables 4-3 and 4-4.

Table 5-2. Sample Design Implementation and Completion Evaluation for 300 Area Remedial Investigation Wells

Well Name[a]	Work Plan No.	Aquifer Sediment Split-Spoon Samples			Groundwater Samples		
		Number of Intervals Sampled	Number Estimated in Sampling and Analysis Plan[b]	Percent of Estimated Number Completed	Number of Intervals Sampled	Number Estimated in Sampling and Analysis Plan[b]	Percent of Estimated Number Completed
399-1-57	6	31	31	100%	3	5[c]	100%
399-1-55	9	3	7	43%	4	5[c]	100%
399-1-58	1	3	3	100%	2	5[c]	60%
399-1-56	10	4[e]	5	90%	4	5[c]	100%
399-1-54	8	7[d,e]	9	78%	2	5[c]	60%
399-2-32	11	7[d,e]	9	78%	1	5[c]	60%
399-3-33	7	3	5	60%	3	5[c]	60%
399-1-59	3	7	8	88%	1	5[c]	60%
399-6-3	2	4	5	90%	2	5[c]	60%
399-6-5	4	5	5	100%	3	5[c]	80%
399-4-15	5	5	5	100%	4	5[c]	100%
399-1-61	A	4	4	100%	1	1	100%
399-1-62	B	4	4	100%	1	1	100%
399-1-63	C	4	4	100%	1	1	100%
399-1-64	D	4	4	100%	1	1	100%
399-3-38	E	3	4	75%	1	1	100%

a. Remedial investigation wells are listed in the order drilled.

b. Estimates for the numbers of samples at each location are presented in DOE/RL-2009-45, *300 Area Remedial Investigation/Feasibility Study Sampling and Analysis Plan for the 300-FF-1, 300-FF-2 and 300-FF-5 Operable Units* (Table 3-2), as modified by TPA-CN-352, *Change Notice for Modifying DOE/RL-2009-45, Rev. 0: 300 Area Remedial Investigation/Feasibility Study Sampling and Analysis Plan for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units*.

c. In accordance with Table 3-2 in DOE/RL-2009-45, groundwater samples from the 11 full characterization remedial investigation wells were to be collected from the top, middle, and bottom of the unconfined aquifer and, as necessary, at geology changes. In particular, supplemental samples from water-yielding fine grained units were to be targeted. As a result, the minimum required number of groundwater samples for each of these wells was 3. In Table 3-2 of DOE/RL-2009-45, the estimated number of samples for each of these wells was 5 based on the potential for additional samples at geology changes. Samples were collected from the top, middle, and bottom of the unconfined aquifer in all 11 full characterization remedial investigation wells, with the exception of the sample from the top of the aquifer in well 399-3-33.

d. One additional saturated sediment split-spoon sample was attempted but no sediment was recovered in the sampler.

e. Samples of Ringold fine-grained sediment and groundwater were not collected because the geologic unit was not present.

f. Unable to collect groundwater sample from Ringold fine-grained sediment because of low yield.

Table 5-3. Sample Design Implementation and Completion Evaluation for 300 Area Spatial and Temporal Uncertainty Wells

Location[a]	Samples Required[b]	Sampling Completed	Percent Complete
399-1-10A	Three sampling events to represent seasonal river stage conditions: • High - June • Transition - July/August • Low - September/October	04-Jun-10, 09-Aug-10, 10-Nov-10	100%
399-1-12		06-Jun-10, 09-Aug-10, 14-Dec-10	100%
399-1-17A		04-Jun-10, 09-Aug-10, 10-Nov-10	100%
399-1-21A		04-Jun-10, 05-Aug-10, 11-Nov-10	100%
399-1-6		04-Jun-10, 05-Aug-10, 10-Nov-10	100%
399-2-1		04-Jun-10, 03-Aug-10, 10-Nov-10	100%
399-2-2		04-Jun-10, 03-Aug-10, 10-Nov-10	100%
399-3-6		06-Jun-10, 04-Aug-10, 10-Nov-10	100%
399-3-9		06-Jun-10, 04-Aug-10, 11-Nov-10	100%
399-3-12		23-Jun-10, 04-Aug-10, 14-Nov-10	100%
399-3-20		06-Jun-10, 03-Aug-10, 14-Nov-10	100%
399-4-1		09-Jun-10, 04-Aug-10, 11-Nov-10	100%
399-4-9		04-Jun-10, 04-Aug-10, 11-Nov-10	100%
399-4-12		06-Jun-10, 03-Aug-10, 15-Nov-10	100%
399-4-14		09-Jun-10, 04-Aug-10, 15-Nov-10	100%
499-S0-7		07-Jul-10, 11-Aug-10, 11-Nov-10	100%
499-S0-8		07-Jul-10, 11-Aug-10, 11-Nov-10	100%
499-S1-8J		07-Jul-10, 11-Aug-10, 11-Nov-10	100%
699-1-18		10-Jun-10, 02-Aug-10, 30-Nov-10	100%
699-12-4D		10-Jun-10, 02-Sep-10, 20-Dec-10	100%
699-13-1A		23-Jun-10, 19-Sep-10, 06-Dec-10	100%
699-13-1E		10-Jun-10, 12-Aug-10, 06-Dec-10	100%
699-13-2D		10-Jun-10, 12-Aug-10, 06-Dec-10	100%
699-13-3A		10-Jun-10, 12-Aug-10, 06-Dec-10	100%
699-15-15B		10-Jun-10, 04-Aug-10, 09-Dec-10	100%
699-20-E5A		10-Jun-10, 01-Sep-10, 05-Dec-10	100%
699-S18-E2B		29-Aug-10, 19-Sep-10, 19-Dec-10	100%
699-S19-11		23-Jun-10, 02-Aug-10, 14-Dec-10	100%
699-S28-E0		10-Jun-10, 02-Aug-10, 14-Dec-10	100%
699-S3-E12		10-Jun-10, 02-Aug-10, 07-Dec-10	100%
699-S6-E4A		14-Jun-10, 02-Aug-10, 19-Dec-10	100%
699-S8-19		10-Jun-10, 02-Aug-10, 09-Dec-10	100%

a. 699-S6-E4A (DOE/RL-2009-45, *300 Area Remedial Investigation/Feasibility Study Sampling and Analysis Plan for the 300-FF-1, 300-FF-2 and 300-FF-5 Operable Units*, Tables 3-3 and 3-4).

b. In accordance with TPA-CN-374, *Tri-Party Agreement Change Notice Form: DOE/RL-2009-45, 300 Area Remedial Investigation/Feasibility Study Sampling and Analysis Plan for the 300-FF-1, 300-FF-2 and 300-FF-5 Operable Units, Rev. 0*, well 399-3-11 was not sampled because it was decommissioned.

6 Data Requirements

6.1 Analytical Requirements

Table 6-1 lists the analytical performance requirements, as specified in the 300 Area SAP (DOE/RL-2009-45), for laboratory analyses of groundwater samples collected from existing wells for the 300-FF-5 OU remedial investigation. Table 6-2 includes the analytical performance requirements for laboratory analysis of aquifer sediment samples collected during drilling of new boreholes for the 300-FF-5 OU remedial investigation. Table 6-3 lists the analytical performance requirements for laboratory analyses of groundwater samples collected during drilling of new boreholes for the 300-FF-5 OU remedial investigation.

6.2 Laboratory Quality Assurance and Quality Control Requirements

The quality assurance/quality control (QA/QC) requirements govern nearly all aspects of analytical laboratory operation, including instrument procurement, maintenance, calibration and operation. Laboratory requirements for internal QC checks are performed as appropriate for the analytical method at a rate of one per sample per sample delivery group (SDG) or 1 in 20 (5 percent), whichever is more frequent. Laboratory internal QC checks include the following:

- **Laboratory Contamination.** Each analytical batch contains a laboratory (method) blank (material of composition similar to that of the samples with known/minimal contamination of the analytes of interest) carried through the complete analytical process. The method blank is used to evaluate false positive results in samples caused by contamination during handling at the laboratory.

- **Analytical Accuracy.** For most analyses, a known quantity of representative analytes of interest (matrix spike [MS]) is added to a separate aliquot of a sample from the analytical batch. The known amount added is compared to the actual measured amount to calculate the percent recovery. The recovery percentage of the added MS is used to evaluate analytical accuracy. For analyses not amenable to MS techniques (such as gamma energy analysis [GEA]) or where analytical recovery is evaluated from recovery of the tracers or carriers, the accuracy of the laboratory preparation and analysis is evaluated via QC reference samples (such as laboratory control spike). In addition to the MS recovery, surrogate compounds are used to evaluate accuracy in the volatile organic analysis. Surrogate compounds with instrumental responses that are typical of the other analytes are added into the blanks, samples, and MSs, and the recovery is evaluated.

- **Analytical Precision.** Separate aliquots removed from the sample containers (duplicate samples) are analyzed for each analytical batch for radionuclides and metals. The duplicate sample results are compared to the original sample results, which are evaluated as relative percent differences (RPDs) and are used to assess analytical precision. Alternately, a matrix spike duplicate (MSD) may be used for assessing precision of metals and organic parameters. For a MSD, a separate aliquot is removed from the same sample container and spike in the same manner as the MS. The results, not recoveries, from the MS/MSD are used to calculate a RPD and to assess precision.

- **Laboratory Control Samples or QC Reference Samples (Analytical Accuracy).** A laboratory control sample (LCS) is prepared from an independent standard at a concentration other than that used for calibration but within the calibration range. The LCS is taken through all the preparation and analysis steps used in the method. The LCS or QC reference sample measures the accuracy of the analytical process. Depending on how it is introduced into the analysis, the LCS is sometimes referred to as a blank spike sample.

Laboratories are also subject to periodic and random audits of laboratory performance, systems, and overall program. Audits check that the laboratories are performing to laboratory contract requirements. No audits were performed with respect to the data analyses performed as part of this project.

6.3 Qualification Flags

During the generation of environmental analytical data, any of several qualification flags may be assigned to an individual result. The HEIS database carries qualification flags applied by three sources: the laboratory, the third party data validator, or a data user. The tables of data within this report show all of these applied qualification flags. Potential flags and their meaning are provided in Table 6-4.

6.4 Preliminary Cleanup Goals and Action Levels

Action levels for the groundwater COPCs for spatial and temporal uncertainty monitoring are provided in Table 6-1. Preliminary cleanup goals for aquifer sediment target analytes are provided in Table 6-2.

Table 6-1. Analytical Performance Requirements for 300 and 600 Area Subregion Spatial and Temporal Uncertainty Monitoring Well Water Samples

CAS	Analyte	Analytical Method[a]	QL	Precision Requirement (%)	Accuracy Requirement (%)	Action Level	Action Level Basis
Performance Requirements for Field Measurements							
—	Oxidation reduction potential	REDOX PROBE	N/A	[b]	[b]	N/A	N/A
—	pH measurement	PROBE	0.5 pH unit	[b]	[b]	N/A	N/A
—	Specific conductance	PROBE	1 µS/cm	[b]	[b]	N/A	N/A
—	Temperature	PROBE	—	[b]	[b]	N/A	N/A
—	Dissolved oxygen	PROBE	—	[b]	[b]	N/A	N/A
—	Turbidity	PROBE	0.1 NTU	[b]	[b]	N/A	N/A
Performance Requirements for Laboratory Measurements (radiological)							
15046-84-1	Iodine-129	Iodine-129 – low level	1 pCi/L[c]	≤30[e]	70-130[d]	1 pCi/L	40 CFR 141.66
10098-97-2	Strontium-90	Strontium-90	2 pCi/L	≤30[d]	70-130[d]	8 pCi/L	40 CFR 141.66
10028-17-8	Tritium	LSC – Tritium	400 pCi/L	≤30[d]	70-130[d]	20,000 pCi/L	40 CFR 141.66
—	Uranium-233/234	Isotopic – Uranium	1 pCi/L	≤30[e]	70-130[e]	15 pCi/L	Federal MCL
15117-96-1	Uranium-235	Isotopic – Uranium	1 pCi/L	≤30[e]	70-130[e]	15 pCi/L	Federal MCL
7440-61-1	Uranium-238	Isotopic – Uranium	1 pCi/L	≤30[e]	70-130[e]	15 pCi/L	Federal MCL
Performance Requirements for Laboratory Measurements (nonradiological)							
7440-36-0	Antimony	Trace – ICP (6010) or ICP/MS (6020 or 200.8)	5 µg/L	≤20[e]	80-120[e]	5.60 µg/L	Human Health for the Consumption of Water + Organism
7440-38-2	Arsenic	Trace – ICP (6010) or ICP/MS (6020 or 200.8)	4 µg/L[c,f]	≤20[e]	80-120[e]	0.018 µg/L	Human Health for the Consumption of Water + Organism
7440-43-9	Cadmium	Trace – ICP (6010) or ICP/MS (6020 or 200.8)	2 µg/L[c,f]	≤20[e]	80-120[e]	0.25 µg/L	Freshwater CCC
7440-47-3	Chromium	EPA 6010 (ICP metals)	10 µg/L	≤20[e]	80-120[e]	74 µg/L	Freshwater CCC
7440-48-4	Cobalt	EPA 6010 (ICP metals)	4 µg/L	≤20[e]	80-120[e]	4.8 µg/L	WAC 173-340-720(4)
7440-50-8	Copper	Trace – ICP (6010)	8 µg/L	≤20[e]	80-120[e]	9 µg/L	Freshwater CCC
7439-92-1	Lead	Trace – ICP (6010) or ICP/MS (6020 or 200.8)	2 µg/L[f]	≤20[e]	80-120[e]	2.5 µg/L	Freshwater CCC
7439-96-5	Manganese	EPA 6010 (ICP metals)	5 µg/L	≤20[e]	80-120[e]	50 µg/L	40 CFR 143.3
7439-97-6	Mercury	EPA 7470 or 200.8 (Mercury)	0.5 µg/L[f]	≤20[e]	80-120[e]	0.05 µg/L	WAC 173-201A
7440-02-0	Nickel	EPA 6010 (ICP metals)	40 µg/L	≤20[e]	80-120[e]	52 µg/L	Freshwater CCC
7782-49-2	Selenium	Trace – ICP (6010) or ICP/MS (6020 or 200.8)	4 µg/L	≤20[e]	80-120[e]	5 µg/L	Freshwater CCC

Table 6-1. Analytical Performance Requirements for 300 and 600 Area Subregion Spatial and Temporal Uncertainty Monitoring Well Water Samples

CAS	Analyte	Analytical Method[a]	QL	Precision Requirement (%)	Accuracy Requirement (%)	Action Level	Action Level Basis
7440-22-4	Silver	EPA 6010 (ICP metals)	10 µg/L[f]	≤20[e]	80-120[e]	5 µg/L	WAC 173-201A
7440-28-0	Thallium	Trace – ICP (6010) or ICP/MS (6020 or 200.8)	2 µg/L[c,f]	≤20[e]	80-120[e]	0.24 µg/L	Human Health for the Consumption of Water + Organism
7440-61-1	Uranium	Total uranium (chemical)	1 µg/L	≤20[e]	80-120[e]	30 µg/L	40 CFR 141.66
7440-66-6	Zinc	EPA 6010 (ICP metals)	10 µg/L	≤20[e]	80-120[e]	120 µg/L	Freshwater CCC
540-59-0	1,2-Dichloroethene (total)	EPA 8260 (volatile organics)	10 µg/L	≤20[g]	80-120[g]	72 µg/L	WAC 173-340-720(4)
56-23-5	Carbon tetrachloride	EPA 8260 (volatile organics)	2 µg/L[c]	≤20[g]	80-120[g]	0.23 µg/L	Human Health for the Consumption of Water + Organism
67-66-3	Chloroform	EPA 8260 (volatile organics)	5 µg/L	≤20[g]	80-120[g]	5.7 µg/L	Human Health for the Consumption of Water + Organism
156-59-2	cis-1,2-Dichloroethene	EPA 8260 (volatile organics)	5 µg/L	≤20[g]	80-120[g]	70 µg/L	40 CFR 141.66
127-18-4	Tetrachloroethene	EPA 8260 (volatile organics)	5 µg/L[c]	≤20[g]	80-120[g]	0.081 µg/L	WAC 173-340-720(4)
79-01-6	Trichloroethene	EPA 8260 (volatile organics)	2 µg/L[c]	≤20[g]	80-120[g]	0.49 µg/L	WAC 173-340-720(4)
126-73-8	Tributyl Phosphate	EPA 8270 (semivolatile organics)	100 µg/L[c]	≤20[g]	80-120[g]	16.2 µg/L	WAC 173-340-720(4)
75-01-4	Vinyl chloride	EPA 8260 (volatile organics)	5 µg/L[c]	≤20[g]	80-120[g]	0.029 µg/L	Human Health for the Consumption of Water + Organism
57-12-5	Cyanide	EPA 9010 or 9012 (total cyanide)	5 µg/L	≤20[g]	80-120[g]	5.2 µg/L	Freshwater CCC
16984-48-8	Fluoride	EPA 300.0 (anions by IC)	500 µg/L	≤20[e]	80-120[e]	960 µg/L	WAC 173-340-720(4)
14797-55-8	Nitrate (as Nitrogen)	EPA 300.0 (anions by IC)	250 µg/L	≤20[e]	80-120[e]	10,000 µg/L	40 CFR 141.66
14797-65-0	Nitrite (as Nitrogen)	EPA 300.0 (anions by IC)	250 µg/L	≤20[e]	80-120[e]	1,000 µg/L	40 CFR 141.66
14808-79-8	Sulfate	EPA 300.0 (anions by IC)	500 µg/L	≤20[e]	80-120[e]	250,000 µg/L	40 CFR 143.3
—	Alkalinity	[h]	[h]	[h]	[h]		

Table 6-1. Analytical Performance Requirements for 300 and 600 Area Subregion Spatial and Temporal Uncertainty Monitoring Well Water Samples

CAS	Analyte	Analytical Method[a]	QL	Precision Requirement (%)	Accuracy Requirement (%)	Action Level	Action Level Basis

Sources:

40 CFR 141.66, "National Primary Drinking Water Regulations," "Maximum Contaminant Levels for Radionuclides."

40 CFR 143.3, "National Secondary Drinking Water Regulations," "Secondary Maximum Contaminant Levels."

WAC 173-201A, "Water Quality Standards for Surface Waters of the State of Washington."

WAC 173-340-720(4), "Model Toxics Control Act—Cleanup," "Groundwater Cleanup Standards," "Method B Cleanup Levels for Potable Groundwater."

a. Equivalent methods may be substituted. For EPA Method 300.0, see EPA/600/R-93/100, *Methods for the Determination of Inorganic Substances in Environmental Samples*. For EPA Method 200.8, see EPA-600/R-94/111, *Methods for the Determination of Metals in Environmental Samples, Supplement I*. For the four-digit EPA methods, see SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final Update IV-B*. Tentatively identified compounds will be reported for Method 8260.

b. Field measurements have no specific accuracy quality control requirement except to perform checks to verify manufacturer's expected performance.

c. Calculated cleanup goals are below established analytical methodology capabilities. The analytical detection limits will be used for working levels, and will be periodically reviewed to establish if lower detection limit capabilities have become available.

d. Accuracy criteria shown are for associated batch laboratory control sample percent recoveries. Additional accuracy criteria include analysis–specific evaluations performed for matrix spike, tracer, and/or carrier recoveries, as appropriate to the method. Precision criteria shown are for batch laboratory replicate matrix spike analyses or replicate sample analyses.

e. Accuracy criteria specified are for calculated percent recoveries for associated analytical batch matrix spike samples. Additional accuracy evaluation based on statistical control limits for analytical batch laboratory control samples is also preformed. The precision criteria shown are for batch laboratory replicated matrix spike or replicate sample relative percent difference.

f. To meet or approach calculated action levels, laboratories must use axial-based ("trace") ICP analytical methods. The laboratory also may substitute graphite furnace or ICP/MS methods if estimated quantitation limits are met.

g. The accuracy criteria shown are the minimum for associated catch laboratory control sample percent recoveries. Laboratories must meet statistically based control limits, if more stringent. Additional accuracy criteria include analyte-specific evaluations performed for matrix spike and surrogate recoveries, as appropriate to the method. The precision criteria shown are for laboratory replicate matrix spike analysis relative differences. Tentatively identified compounds will be reported for SG-846 methods 8260 and 8270.

h. Rounds, 2006, "Alkalinity and Acid Neutralizing Capacity (Version 3.0)."

CAS = Chemical Abstracts Service
CCC = criterion continuous concentration
IC = ion chromatography
ICP = inductively coupled plasma
LSC = liquid scintillation counter
MCL = maximum contaminant level
MS = mass spectrometry
N/A = not applicable
NTU = nephelometric turbidity unit
QL = quantitation limit
REDOX = Reduction Oxidation (Plant or process)

Table 6-2. Analytical Performance Requirements for Aquifer Sediment Samples

CAS	Analyte	QL	Preliminary Cleanup Goals[1]				Analytical Method[2]	Precision Requirement (%)	Accuracy Requirement (%)
			Direct Exposure (residential)	Direct Exposure (industrial)	Groundwater Protection	River Protection			
Performance Requirements for Laboratory Measurements (radiological)									
—	Uranium-233/234	1 pCi/g	167 pCi/g	27.2 pCi/g	127.4 pCi/g	17.9 pCi/g	Isotopic – Uranium	≤30[6]	70-130[6]
15117-96-1	Uranium-235	0.5 pCi/g	16 pCi/g	2.7 pCi/g	13.2 pCi/g	1.8 pCi/g			
—	Uranium-238	1 pCi/g	167 pCi/g	26.2 pCi/g	127.4 pCi/g	17.3 pCi/g			
Performance Requirements for Laboratory Measurements (non-radiological)									
7440-36-0	Antimony	6 mg/kg[d4]	1,400 mg/kg	32 mg/kg	5 mg/kg	5 mg/kg	EPA 6010 or 6020	≤30[3]	70-130[3]
7440-38-2	Arsenic	10 mg/kg	58 mg/kg	20 mg/kg	20 mg/kg	20 mg/kg			
7440-39-3	Barium	2 mg/kg	4,900 mg/kg	1,600 mg/kg	200 mg/kg	400 mg/kg			
7440-41-7	Beryllium	0.5 mg/kg	104 mg/kg	10.4 mg/kg	1.51 mg/kg	1.51 mg/kg			
7440-43-9	Cadmium	0.5 mg/kg	139 mg/kg	13.9 mg/kg	0.81 mg/kg	0.81 mg/kg			
7440-47-3	Chromium (total)	1 mg/kg	5,250,000 mg/kg	120,000 mg/kg	18.5 mg/kg	18.5 mg/kg			
7440-48-4	Cobalt	14 mg/kg	-	-	-	-			
7440-50-8	Copper	1 mg/kg	130,000 mg/kg	2,960 mg/kg	59.2 mg/kg	22.0 mg/kg			
7439-92-1	Lead	5 mg/kg	1,000 mg/kg	353 mg/kg	10.2 mg/kg	10.2 mg/kg			
7439-96-5	Manganese	5 mg/kg	165,000 mg/kg	3,760mg/kg	512 mg/kg	512 mg/kg			
7440-02-0	Nickel	4 mg/kg	70000 mg/kg	1,600 mg/kg	19.1 mg/kg	27.4 mg/kg			
7782-49-2	Selenium	10 mg/kg	17,500 mg/kg	400 mg/kg	5 mg/kg	1 mg/kg			
7440-22-2	Silver	1 mg/kg[4]	17,500 mg/kg	400 mg/kg	8 mg/kg	0.73 mg/kg			
7440-28-0	Thallium	5 mg/kg	245 mg/kg	NV mg/kg	1.59 mg/kg	4.46 mg/kg			
7440-66-6	Zinc	1 mg/kg	1,050,000 mg/kg	48,000 mg/kg	480 mg/kg	67.8 mg/kg			
7439-97-6	Mercury	0.2 mg/kg	1,050 mg/kg	24 mg/kg	0.33 mg/kg	0.33 mg/kg	EPA 7471 (mercury cold vapor)	≤30[3]	70-130[3]
7440-61-1	Uranium (total)	1 mg/kg	505 mg/kg	81 mg/kg	53 mg/kg	106 mg/kg	UKPA or via Isotopic	≤30[3]	70-130[3]
16887-00-6	Chloride	2 mg/kg	NV	NV	25,000 mg/kg	N/A	EPA 300.0 (anions by IC)	≤30[3]	70-130[3]
16984-48-8	Fluoride	5 mg/kg	210,000 mg/kg	4,800 mg/kg	96 mg/kg	400 mg/kg			
147-97-55-8	Nitrate (as Nitrogen)	2.5 mg/kg	5,600,000 mg/kg	8,000 mg/kg	1,000 mg/kg	2,000 mg/kg			
147-97-65-0	Nitrite (as Nitrogen)	2.5 mg/kg	350,000 mg/kg	8,000 mg/kg	100 mg/kg	200 mg/kg			
56-23-5	Carbon tetrachloride	0.005 mg/kg	1,010 mg/kg	7.69 mg/kg	0.0337 mg/kg	0.05 mg/kg	EPA 8260 (volatile organics)	≤30[5]	70-130[5]
67-66-3	Chloroform	0.005 mg/kg	-	-	-	-			
540-59-2	1,2-Dichloroethene (total)	0.005 mg/kg	-	-	-	-			
156-59-2	cis-1,2-dichloroethene[6]	0.005 mg/kg	35,000 mg/kg	NV	0.350 mg/kg	NV			
127-18-4	Tetrachloroethene[6]	0.005 mg/kg	35,000 mg/kg	NV	0.008 mg/kg	0.008 mg/kg			
79-01-6	Trichloroethene[6]	0.005 mg/kg[7]	1,470 mg/kg	NV	0.003 mg/kg	0.090 mg/kg			
75-01-4	Vinyl chloride[6]	0.005 mg/kg[7]	87.5 mg/kg	NV	0.00018 mg/kg	0.0252 mg/kg			
—	Total carbon	200 mg/kg	N/A	N/A	N/A	N/A	Carbon dioxide coulometer	N/A	N/A

Table 6-2. Analytical Performance Requirements for Aquifer Sediment Samples

CAS	Analyte	QL	Preliminary Cleanup Goals[1]				Analytical Method[2]	Precision Requirement (%)	Accuracy Requirement (%)
			Direct Exposure (residential)	Direct Exposure (industrial)	Groundwater Protection	River Protection			
—	Inorganic carbon	200 mg/kg	N/A	N/A	N/A	N/A	Carbon dioxide coulometer	N/A	N/A
—	Calcium carbonate equivalent	N/A	N/A	N/A	N/A	N/A	Calculation	N/A	N/A
Performance Requirements for Physical Properties									
—	Grain-size (sieve) analysis	N/A	N/A	N/A	N/A	N/A	Field procedure or ASTM D422-63	N/A	N/A
—	Sediment moisture content	N/A	N/A	N/A	N/A	N/A	ASTM D2216-05	N/A	N/A
—	Bulk density	N/A	N/A	N/A	N/A	N/A	ASTM D2937-04	N/A	N/A

Notes:

ASTM D422-63(2007), *Standard Test Method for Particle-Size Analysis of Soils*.

ASTM D2216-05, *Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass*.

ASTM D2937-04, *Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method*.

1. Unless otherwise noted, Preliminary Cleanup Goals are established in DOE/RL-2001-47, *Remedial Design Report/Remedial Action Work Plan for the 300 Area*.

2. Equivalent methods may be substituted. For EPA Method 300.0, see EPA/600/R-93/100, *Methods for the Determination of Inorganic Substances in Environmental Samples*. For the four-digit EPA methods, see SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final Update IV-B*.

3. The accuracy criteria shown are for associated batch laboratory control sample percent recoveries. Additional accuracy criteria include analysis-specific evaluations preformed for matrix spike, tracer, and/or carrier recoveries, as appropriate to the method. The precision criteria shown are for batch laboratory replicate sample relative percent differences.

4. To meet or approach calculated cleanup goals, laboratories must use axial-based ("trace") ICP analytical methods. The laboratory also may substitute graphite furnace or ICP/MS methods if QLs are met.

5. The accuracy criteria shown are the minimum for associated batch laboratory control sample percent recoveries. Laboratories must meet statistically based control, if more stringent. Additional accuracy criteria include analyte-specific evaluations preformed for matrix spike and surrogate recoveries, as appropriate to the method. The precision criteria shown are for batch laboratory replicate matrix spike analysis relative percent differences. Tentatively identified compounds will be reported for Methods 8260 and 8270.

6. Preliminary cleanup goal values from WCH-333, *Identification of 300-Area Contaminants of Potential Concern for Soil*.

7. Calculated cleanup goals are below established analytical methodology capabilities. The analytical detection limits will be used for working levels, and will be periodically reviewed to establish if lower detection limit capabilities have become available.

$CaCO_3$	=	calcium carbonate	N/A	=	not applicable
CAS	=	Chemical Abstracts Service	NV	=	no value
IC	=	ion chromatography	QL	=	quantitation limit
ICP	=	inductively coupled plasma	RESRAD	=	RESidual RADioactivity (dose model)
MS	=	mass spectrometry	UKPA	=	total uranium by kinetic phosphorescence analysis

Table 6-3. Analytical Performance Requirements for Groundwater Water Samples from New Wells

CAS	Analyte	Analytical Method[1]	QL	Precision Requirement (%)	Accuracy Requirement (%)
Performance Requirements for Field Measurements					
—	Oxidation reduction potential	REDOX PROBE	N/A	[2]	[2]
—	pH measurement	PROBE	0.5 pH unit	[2]	[2]
—	Specific conductance	PROBE	1 µS/cm	[2]	[2]
—	Temperature	PROBE	—	[2]	[2]
—	Dissolved oxygen	PROBE	—	[2]	[2]
—	Turbidity	PROBE	0.1 NTU	[2]	[2]
—	Water level in the well at time of sampling	Tape	N/A	N/A	N/A
Performance Requirements for Laboratory Measurements (nonradiological)					
7440-38-2	Arsenic	EPA 6010 or 6020	4 µg/L[3]	≤20[4]	80-120[4]
7440-39-3	Barium	EPA 6010 or 6020	20 µg/L	≤20[4]	80-120[4]
7440-41-7	Beryllium	EPA 6010 or 6020	2 µg/L[3]	≤20[4]	80-120[4]
7440-43-9	Cadmium	EPA 6010 or 6020	2 µg/L[3]	≤20[4]	80-120[4]
7440-47-3	Chromium	EPA 6010 or 6020	10 µg/L	≤20[4]	80-120[4]
7440-50-8	Copper	EPA 6010 or 6020	8 µg/L	≤20[4]	80-120[4]
7439-89-6	Iron	EPA 6010 or 6020	50 µg/L	≤20[4]	80-120[4]
7439-92-1	Lead	EPA 6010 or 6020	2 µg/L[3]	≤20[4]	80-120[4]
7439-95-4	Magnesium	EPA 6010 or 6020	750 µg/L	≤20[4]	80-120[4]
7439-96-5	Manganese	EPA 6010 or 6020	5 µg/L	≤20[4]	80-120[4]
7439-97-6	Mercury	EPA 7470 or 200.8 (Mercury)	0.5 µg/L	≤20[4]	80-120[4]
7440-09-7	Potassium	EPA 6010 or 6020	4,000 µg/L	≤20[4]	80-120[4]
7440-22-4	Silver	EPA 6010 or 6020	10 µg/L	≤20[4]	80-120[4]
7440-66-6	Zinc	EPA 6010 or 6020	10 µg/L	≤20[4]	80-120[4]
7440-61-1	Uranium	Total uranium (chemical)	1 µg/L	≤20[4]	80-120[4]
56-23-5	Carbon tetrachloride	EPA 8260 (volatile organics)	2 µg/L	≤20[5]	80-120[5]
156-59-2	cis-1,2-Dichloroethene	EPA 8260 (volatile organics)	5 µg/L	≤20[5]	80-120[5]
127-18-4	Tetrachloroethene	EPA 8260 (volatile organics)	5 µg/L	≤20[5]	80-120[5]

Table 6-3. Analytical Performance Requirements for Groundwater Water Samples from New Wells

CAS	Analyte	Analytical Method[1]	QL	Precision Requirement (%)	Accuracy Requirement (%)
79-01-6	Trichloroethene	EPA 8260 (volatile organics)	2 µg/L	≤20[5]	80-120[5]
75-01-4	Vinyl Chloride	EPA 8260 (volatile organics)	5 µg/L	≤20[5]	80-120[5]
16887-00-6	Chloride	EPA 300.0 (anions by IC)	200 µg/L	≤20[4]	80-120[4]
24959-67-9	Bromide	EPA 300.0 (anions by IC)	250 µg/L	≤20[4]	80-120[4]
16984-48-8	Fluoride	EPA 300.0 (anions by IC)	500 µg/L	≤20[4]	80-120[4]
14797-55-8	Nitrate (as Nitrogen)	EPA 300.0 (anions by IC)	250 µg/L	≤20[4]	80-120[4]
14797-65-0	Nitrite (as Nitrogen)	EPA 300.0 (anions by IC)	250 µg/L	≤20[4]	80-120[4]
14265-44-2	Phosphate	EPA 300.0 (anions by IC)	500 µg/L	≤20[4]	80-120[4]
14808-79-8	Sulfate	EPA 300.0 (anions by IC)	500 µg/L	≤20[4]	80-120[4]
—	Alkalinity	[6]	[6]	[6]	[6]
—	Microbiological activity	[7]	[7]	[7]	[7]

[1] Equivalent methods may be substituted. For EPA Method 300.0, see EPA/600/R-93/100, *Methods for the Determination of Inorganic Substances in Environmental Samples*. For the four-digit EPA methods, see SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; Final Update IV-B*. Tentatively identified compounds will be reported for Method 8260.

[2] Field measurements have no specific QC requirement except to perform checks to verify manufacturer's expected performance.

[3] To meet QL goals, laboratories must use axial-based ("trace") ICP analytical methods. The laboratory also may substitute graphite furnace or ICP/MS methods if QLs are met.

[4] Accuracy criteria specified are for calculated recent recoveries for associated analytical batch matrix spike samples. Additional accuracy evaluation based on statistical control limits for analytical batch laboratory control samples is also performed. The precision criteria shown are for batch laboratory replicated matrix spike or replicate sample relative percent difference.

[5] Accuracy criteria shown are the minimum for associated batch laboratory control sample percent recoveries. Laboratories must meet statistically based control limits, if more stringent. Additional accuracy criteria include analyte-specific evaluations performed for matrix spike and surrogate recoveries, as appropriate to the method. The precision criteria shown are for batch laboratory replicate matrix spike analysis relative percent differences. Tentatively indentified compounds will be reported for SW-846 Methods 8260 and 8270.

[6] Rounds, 2006, "Alkalinity and Acid Neutralizing Capacity (Version 3.0)."

[7] The purpose of determining microbial activity will be to identify the microbes in the aquifer responsible for degradation of trichloroethene or tetrachloroethene to dichloroethene. Details of the tests, including QL, precision and accuracy, will be discussed with the laboratory personnel before analysis.

CAS = Chemical Abstracts Service
QL = quantitation limit
IC = ion chromatography
N/A = not applicable
REDOX = reduction oxidation (plant or process)
NTU = nephelometric turbidity unit

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Table 6-4. Qualification Flags

Flag	Definition
Laboratory-Applied Flags	
B	(Inorganics and Wetchem[a]) – The analyte was detected at a value less than the contract required detection limit (CRDL) but greater than or equal to the method detection limit (MDL). The data should be considered usable for decision making purposes. (Organics) – The analyte was detected in both the associated QC blank and in the sample. (Radionuclides) – The associated QC sample blank has a result >= 2X the minimum detectable activity (MDA) and, after corrections, result is >= MDA for this sample.
C	(Inorganics and Wetchem) – The analyte was detected in both the sample and the associated QC blank, and the sample concentration was less than or equal to five times the blank concentration. The data should be considered unusable for decision making purposes.
D	(Inorganics and Wetchem) – The analyte was detected in both the sample and the associated QC blank, and the sample concentration was less than or equal to five times the blank concentration. The data should be considered unusable for decision making purposes.
E	(Inorganics) – Reported value is estimated because of interference. See any comments that may be in the laboratory report case narrative. (Organics) – Concentration exceeds the calibration range of the gas chromatograph/mass spectrometer (GC/MS).
N	(All) – The spike sample recovery is outside control limits. The data should be considered usable for decision making purposes.
J	(Organics) – Indicates the constituent was analyzed for and detected. The associated value is estimated because of a QC deficiency identified during data validation. The data should be considered usable for decision making purposes.
U	(All) – The constituent was analyzed for and was not detected. The data should be considered usable for decision making purposes.
UJ	UJ – The constituent was analyzed for and was not detected. Because of a QC deficiency identified during data validation, the value reported may not accurately reflect the method detection limit (MDL). The data should be considered usable for decision making purposes.
UR	(All) – Indicates the constituent was analyzed for and not detected; however, because of an identified QC deficiency, the data should be considered unusable for decision making purposes.
R	(All) – Indicates the constituent was analyzed for and detected; however, because of an identified QC deficiency, the data should be considered unusable for decision making purposes.
X	(All) – The result-specific translation of this qualifier code is provided in the data report and/or case narrative.
Third Party-Validation Applied Flags	
U	The constituent was analyzed for, but was not detected. The data should be considered usable for decision making purposes.
UJ	The constituent was analyzed for and was not detected. Because of a quality control deficiency identified during data validation, the value reported may not accurately reflect the Reporting Limit (RL). The data should be considered usable for decision making purposes.
J	Indicates the constituent was analyzed for and detected. The associated value is estimated because of a quality control deficiency identified during data validation. The data should be

Table 6-4. Qualification Flags

Flag	Definition
	considered usable for decision-making purposes.
J+	Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected positive bias because of a quality control deficiency identified during data validation. The data should be considered usable for decision making purposes.
J-	Indicates the constituent was analyzed for and detected. The associated value is estimated with a suspected negative bias because of a quality control deficiency identified during data validation. The data should be considered usable for decision making purposes
N	The analysis indicates the presence of an analyte that has been tentatively identified.
NJ	The analysis indicates the presence of an analyte that has been tentatively identified and the associated numerical value represents its approximate concentration.
NJ+	The analysis indicates the presence of an analyte that has been tentatively identified. The associated value is estimated with a suspected positive bias because of a quality control deficiency identified during data validation.
NJ-	The analysis indicates the presence of an analyte that has been tentatively identified. The associated value is estimated with a suspected negative bias because of a quality control deficiency identified during data validation.
UR	Indicates the constituent was analyzed for and not detected; however, because of an identified quality control deficiency the data should be considered unusable for decision making purposes.
R	Indicates the constituent was analyzed for and detected; however, because of an identified quality control deficiency the data should be considered unusable for decision making purposes.
Data User-Applied Flags	
A	Indicates an issue with the chain of custody that could affect data usability.
F	Result is undergoing further review. (This Review Qualifier is assigned when a Request for Data Review (RDR) is first processed.)
G	Result has been reviewed and determined to be correct, or the result has been corrected with laboratory confirmation or other supporting information.
H	Laboratory holding time was exceeded before the sample was analyzed.
P	Potential problem. Collection/analysis circumstances make the result questionable.
Q	Associated QC sample is out of limits.
R	Do not use. Further review indicates the result is not valid. (This Review Qualifier is used only when there is documented evidence that the result is not valid. Generally, results that are "R" qualified will be excluded from statistical evaluations, maps, and other interpretations.)
Y	Result is suspect. Review had insufficient evidence to show result valid or invalid.
Z	Miscellaneous circumstance exists. Additional information may be found in the Result Comment field (in the HEIS Result table) for this record and/or in the Sample Comment field in the HEIS Sample table.
a. Wetchem is a group of analytical methods which don't use instrumentation but are associated with "wet" chemical reactions.	

7 Results

The 300 Area RI/FS samples were packaged and sent to five laboratories for analysis: WSCF, Lionville, TARL, TASL, and SHAW. Material collected from designated sample intervals was analyzed using specified analytical methods. Sample material designated for a particular analysis by the selected laboratory is tracked by a unique HEIS database number.

Saturated sediment and groundwater samples were submitted to WSCF for chemical and radiochemical analyses, TARL for select chemical and radiochemical analyses, TASL for select chemical analyses, Lionville for select chemical analyses, and SHAW for physical property determinations. Physical properties sample results will not be evaluated in this DQA report.

Analytical requests for chemical and radiochemical services to be completed by the laboratories are documented on the chain-of-custody forms. Analytical results provided by the laboratories are tracked and documented by SDGs in data packages. This section includes an overall evaluation of the data against identified regulatory preliminary cleanup goals or action levels and the validation results for a representative number of SDGs.

7.1 Data Exceeding Preliminary Cleanup Goals or Action Levels

Preliminary cleanup goals for aquifer sediment target analytes and action levels for the groundwater COPCs for spatial and temporal uncertainty monitoring were established in the 300 Area SAP (DOE/RL-2009-45). Table 6-1 presents the analytical performance requirements and action levels for groundwater COPCs for spatial and temporal uncertainty monitoring. Table 6-2 presents the analytical performance requirements and preliminary cleanup goals for aquifer sediment target analytes. Table 7-1 summarizes the results of the comparison of reported results against these regulatory levels.

Table 7-1. Analytical Results Exceeding Preliminary Cleanup Goals or Action Levels

Spatial and Temporal Groundwater Monitoring Samples	
Tritium (20,000 pCi/L, 40 CFR 141.66)	Samples from wells 699-13-1E (all three rounds), well 699-13-2D (all three rounds) well 699-13-3A (all three rounds, including the field duplicate) and well 699-20-E5A (all three rounds)
Uranium-233/234 (15 pCi/L, federal MCL)	Samples from wells 399-1-17A (all three rounds, including the split), 399-1-21A (sample collected on 08/05/10), 399-2-1 (all three rounds), 399-2-2 (all three rounds, including the field duplicate), 399-3-12 (sample collected on 06/23/10), 399-3-20 (sample collected on 08/03/10), 399-3-6 (samples collected on 08/04/10 and 11/10/10), 399-3-9 (all three rounds), 399-4-14 (sample collected on 08/04/10) and 399-4-9 (all three rounds)
Uranium-238 (15 pCi/L, federal MCL)	Samples from wells 399-1-17A (all three rounds, including the split), and 399-2-1 (all three rounds), 399-2-2 (all three rounds, including the field duplicate), 399-3-12 (sample collected on 06/23/10), 399-3-20 (sample collected on 08/03/10), 399-3-6 (sample collected on 08/04/10), 399-3-9 (all three rounds), 399-4-14 (sample collected on 08/04/10), and 399-4-9 (all three rounds)
Arsenic (0.018 µg/L, Human Health for the Consumption of Water + Organism)	All samples collected
Copper (9 µg/L, Freshwater CCC)	Samples collected from wells 399-3-12 (samples collected on 08/03/2010 and 11/14/2010) and 499-S1-8J (sample collected on 07/07/10)

Table 7-1. Analytical Results Exceeding Preliminary Cleanup Goals or Action Levels

Spatial and Temporal Groundwater Monitoring Samples	
Lead (2.5 µg/L, Freshwater CCC)	Samples collected from well 399-4-12 (sample collected on 08/03/10)
Manganese (50 µg/L, 40 CFR 143.3)	Samples collected from wells 699-S18-E2B (samples collected on 09/19/10 and 09/19/10) and 499-S0-7 (sample collected on 07/07/10)
Mercury (0.05 µg/L WAC 173-201A)	All samples collected
Selenium (5 µg/L, Freshwater CCC)	Samples collected from wells 399-1-17A (sample collected on 08/09/10), 699-12-4D (sample and split collected on 12/20/10), 699-15-15B (all three rounds), 699-20-E5A (samples collected on 09/01/10), and 699-S6-E4A (samples collected on 12/19/10)
Silver (5 µg/L, WAC 173-201A)	All samples collected. Note ICP-MS data all below action level.
Thallium (0.24 µg/L, Human Health for the Consumption of Water + Organism)	Samples collected from wells 399-1-17A (samples collected on 08/09/10) and 399-3-12 (sample collected on 11/14/10)
Uranium (30 µg/L, 40 CFR 141.66)	Samples collected from wells 399-1-10A (samples collected on 06/04/10 and 11/10/10), 399-1-17A (all three rounds), 399-1-21A (sample collected on 08/05/10), 399-2-1 (all three rounds), 399-2-2 (all three rounds, including the field duplicate), 399-3-12 (samples collected on 06/23/10 and 08/04/10), 399-3-20 (all three rounds), 399-3-6 (all three rounds), 399-3-9 (all three rounds), 399-4-14 (all three rounds) and 399-4-9 (all three rounds)
Zinc (120 µg/L, Freshwater CCC)	Samples collected from wells 399-3-20 (all three rounds) and 399-1-17A (sample collected on 08/09/10)
Carbon Tetrachloride (0.23 µg/L, Human Health for the Consumption of Water + Organism)	Samples collected from wells 399-1-12 (sample collected on 12/14/10), 399-1-17A (split collected on 08/09/10), 399-3-6 (sample collected on 11/10/10), 399-4-1 (sample collected on 11/11/10) and 399-4-9 (sample collected on 11/11/10)
Chloroform (5.7 µg/L, Human Health for the Consumption of Water + Organism)	Sample from well 699-13-1A (sample collected on 09/19/10)
Tetrachloroethene (0.081 µg/L, WAC 173-340-720(4))	All samples collected, both detect and nondetect values exceeded action level
Trichloroethene (0.49 µg/L, WAC 173-340-720(4))	Samples collected from 399-1-12 (nondetect exceeding action level, sample collected on 12/14/10), 399-1-17A (split sample, nondetect exceeding action level, sample collected on 08/09/10), 399-1-21A (all three rounds), 399-2-1 (samples collected on 8/3/10 and 11/10/10), 399-2-2 (all three rounds, including duplicate), 399-3-12 (samples collected on 08/04/10 and 11/14/10), 399-3-20 (all three rounds), 399-3-6 (all three rounds), 399-3-9 (samples collected on 08/04/10 and 11/11/10), 399-4-1 (all three rounds), 399-4-12 (all three rounds), 399-4-14 (all three rounds), 399-4-9 (all three rounds) and 699-13-3A (samples collected on 12/06/10)
Vinyl chloride (0.029 µg/L, Human Health for the Consumption of Water + Organism)	All nondetects exceeded action level
Nitrate (as Nitrogen) (10,000 µg/L, 40 CFR 141.66)	Samples collected from 399-4-12 (sample collected on 11/15/10), 699-13-1E (all three rounds), 699-13-2D (all three rounds), 699-13-3A (all three rounds, including duplicate)
Aquifer Sediment Samples	
Arsenic (20 mg/kg)	One sample from 399-4-15 (02/01/11)

Table 7-1. Analytical Results Exceeding Preliminary Cleanup Goals or Action Levels

Spatial and Temporal Groundwater Monitoring Samples	
Barium (200 mg/kg)	Samples from wells 399-1-55 (sample collected on 08/26/10), 399-1-57 (sample collected on 08/18/10), 399-1-59 (sample collected on 12/15/10), 399-2-32 (samples collected on 11/05/10 and 11/09/10) and 399-3-33 (sample collected on 12/03/10)
Beryllium (1.51 mg/kg)	One sample from 399-1-55 (sample collected on 08/24/10)
Cadmium (0.81 mg/kg)	One sample from 399-1-55 (sample collected on 08/24/10)
Chromium (18.5 mg/kg)	Samples from wells 399-1-55 (samples collected on 08/24/10 and 08/26/26), 399-1-57 (sample collected on 08/18/10), 399-1-59 (samples collected on 12/15/10), 399-2-32 (sample collected on 11/05/10) and 399-3-33 (sample collected on 12/03/10)
Copper (22.0 mg/kg)	One sample from well 399-2-32 (sample collected on 11/09/10)
Lead (5 mg/kg)	Samples from wells 399-1-58 (sample collected on 08/31/10), 399-2-32 (sample collected on 11/05/10) and 399-6-3 (sample collected on 12/27/10)
Manganese (512 mg/kg)	Samples from wells 399-1-55 (sample collected on 08/24/10), 399-1-57 (sample collected on 08/10/10), and 399-6-3 (sample collected on 02/03/11)
Nickel (19.1 mg/kg)	One sample from well 399-1-55 (sample collected on 08/24/10)
Selenium (1 mg/kg)	Samples from wells 399-1-54 (sample collected on 11/10/10), 399-1-55 (samples collected on 08/24/10 and 08/26/10), 399-1-56 (sample collected on 09/17/10), 399-1-57 (samples collected on 08/11/10, 08/12/10, and 08/18/10), 399-1-58 (sample collected on 08/31/10), 399-1-59 (samples collected on 12/13/10 and 12/15/10), 399-2-32 (samples collected on 11/04/10, 11/05/10, and 11/09/10), 399-3-33 (sample collected on 12-03/10), 399-4-15 (samples collected on 01/28/11 and 02/01/11), 399-6-3 (sample collected on 12/27/10), and 399-6-5 (samples collected on 01/06/11 and 01/10/11)
Silver (0.73 mg/kg)	One sample from well 399-1-55 (sample collected on 08/24/10)
Zinc (67.8 mg/kg)	One sample from well 399-2-32 (sample collected on 11/09/10)

Sources:

40 CFR 141.66, "National Primary Drinking Water Regulations," "Maximum Contaminant Levels for Radionuclides."

40 CFR 143.3, "National Secondary Drinking Water Regulations," "Secondary Maximum Contaminant Levels."

WAC 173-201A, "Water Quality Standards for Surface Waters of the State of Washington."

WAC 173-340-720(4), "Model Toxics Control Act—Cleanup," "Groundwater Cleanup Standards," "Method B Cleanup Levels for Potable Groundwater."

7.2 Nondetect Data Exceeding Quantitation Limits

The majority of laboratory detection limits met the QLs defined in the 300 Area SAP (DOE/RL-2009-45) with the following exceptions:

For the Spatial and Temporal Groundwater Monitoring Samples data set, the laboratories were not able to meet the QLs listed in the 300 Area SAP (DOE/RL-2009-45) for carbon tetrachloride (one nondetect above QL), chromium by method 6010 (all nondetects, note: 200.8 data all met required QL), manganese (two nondetects above QL), selenium (2 nondetects exceeded the QL), strontium-90 (Sr-90) (one

nondetect above QL) and trichloroethene (one nondetect above QL). However, in each of these cases the nondetects were below the associated action levels for the analyte.

For the Aquifer Sediment Samples data set, the laboratories were not able to meet the QLs listed in the SAP for chloride (all samples), fluoride (six nondetects above QL), nitrate (six nondetects above QL) and nitrite (six nondetects above QL).

For the Groundwater Water Samples from New Wells data set, all detection limits met the QLs defined in the 300 Area SAP (DOE/RL-2009-45).

7.3 Data Validation

Data validation was performed by Analytical Quality Associates, Inc. (AQA) of Albuquerque, New Mexico, as documented in the following data validation reports:

- *Data Validation Report for CH2M HILL Plateau Remediation Company VSR11-016 Project CERC11, SPEC10, CERC10 SURV10 Chemical & Radiochemical Validation – Level C* (AQA, 2011a).
- *Data Validation Report for CH2M HILL Plateau Remediation Company VSR11-017 Project 300 Area RI/FS, Chemical & Radiochemical Validation – Level C* (AQA, 2011b).
- *Data Validation Report for CH2M HILL Plateau Remediation Company VSR11-037 Project 300 Area RI/FS, Chemical & Radiochemical Validation – Level C* (AQA, 2011c).

All data flags assigned resulting from data validation were entered into HEIS.

7.3.1 Validation Summary

The 300 Area SAP (DOE/RL-2009-45) specifies that at least 5 percent (by matrix and analyte group) of all chemical and radiochemical data must undergo Level C data validation. Validation of selected laboratory data was performed by AQA. Table 7-2 summarizes the samples and laboratory methods that were independently validated for the 300 RI/FS. As shown in the table, the 5 percent SAP requirement was satisfied.

7.3.1.1 Major Deficiencies

A major deficiency results in the qualification of sample data as unusable for decision making purposes. No major deficiencies were found for organics, general chemistry, and radiochemistry.

A major deficiency was found for metals resulting in the qualification of one mercury sample (B25M25) as an unusable nondetect because of an analytical hold time violation. This is discussed further in Chapter 10, Data Usability Conclusions.

Table 7-2. 300 Area RI/FS Validated Samples

Analyte Category	Total Number of Samples Validated	Total Number of Samples Analyzed	Percent Validated
Spatial and Temporal Groundwater Monitoring Samples VSR11-016			
VOA (8260B)	13	111	12
SVOA (8270C)	13	59	22
ICP-MS Metals (200.8)	34	268	13
ICP-AES Metals (6010)	19	224	8
Ion Chromatography (300.0)	34	115	30
Alkalinity (2320)	10	111	9
Cyanide (4500E or 335.2)	9	52	17
Iodine 129	12	59	20
Strontium-89/90	16	110	15
Tritium	15	110	14
Isotopic Uranium	10	54	19
Groundwater Water Samples from New Wells VSR11-017			
VOA (8260B)	7	73	10
ICP-MS Metals (200.8)	7	64	11
ICP-AES Metals (6010)	7	60	12
Ion Chromatography (300.0)	7	60	12
Alkalinity (2320)	7	60	12
Aquifer Sediment Samples VSR11-017 and VSR11-037			
VOA (8260B)	4	32	12
ICP-MS Metals (200.8)	4	33	12
Ion Chromatography (300.0)	4	33	12
Total Inorganic Carbon, Total Carbon (9060)	4	29	14
Isotopic Uranium	4	35	11

7.3.1.2 Minor Deficiencies

A minor deficiency results in qualification of sample data as nondetect or estimate however the data should be considered usable for decision making purposes.

No minor deficiencies were found for radiochemistry.

A variety of minor deficiencies were identified for organics, metals, and general chemistry. These deficiencies led to results being qualified as estimates or as nondetects as summarized in Table 7-3. In total, 929 analytical data points were subject to third party validation, resulting in the application of 28 validation flags, which comprises 3 percent of the data set reviewed.

7.3.2 Qualification Flags Applied to the Data Set

Tables 7-3 through 7-5 list the qualification flags applied to the data set as a result of the data validation process.

Table 7-3. Summary of Data Validation Qualification Flags for 300 Area RI/FS Spatial and Temporal Groundwater Monitoring Sample Results

Method/Analyte(s)	Qualifier[1]	Affected Samples (Well)	Reason
VSR11-016			
Inorganics			
Mercury	UR	B25M25 (699-13-1A)	Analyzed outside of hold time
Selenium	6.0U[2]	B26M14 and B26M15 (699-20-E5A)	Laboratory blank contamination
Thallium	UJ	B25M24, B25M25 (699-13-1A), B25M59, B25M60 (699-S19-11) and B25PR7 (499-S0-7)	Low MS/MSD recoveries
Thallium	J-	B25PR6 (499-S0-7), B25PT1 (499-S0-8) and B25PT5 (499-S1-8J)	Low MS/MSD recoveries
Thallium	UJ	B286K2, B286K3 (699-S8-19), B286D2 and B286D3 (699-15-15B)	Low MS/MSD recoveries and low LCS recovery
Wet Chemistry (EPA 300.0 – Anions)			
Chloride	J	B25M92 (399-1-10A), B25M94 (399-1-17A) and B25M95 (399-1-21A)	Low MSD recovery
Chloride	J	B26NF1 (699-20-E5A)	High MSD recovery and poor MS/MSD precision
Radiochemistry			
None	None	NA	NA
Organics (SW-846 8260 – Volatile Organic Compounds)			
Carbon tetrachloride	UJ	B286B6 (699-13-1A), B28D45 (FTB), B286C6 (699-13-2D), B286C1 (699-13-1E) and B286D6 (699-15-15B)	Low surrogate recovery
Carbon tetrachloride	J	B286D1 (699-13-13A)	Low surrogate recovery

Table 7-3. Summary of Data Validation Qualification Flags for 300 Area RI/FS Spatial and Temporal Groundwater Monitoring Sample Results

Method/Analyte(s)	Qualifier[1]	Affected Samples (Well)	Reason
Trichloroethene	1.0U[2]	B286D1 and B28D23 (699-13-13A)	Laboratory blank contamination

[1]Qualifiers are defined in Section 6.3.
[2]Original laboratory-reported value in HEIS was changed to match the numerical value shown here.
LCS = laboratory control sample
LCSD = laboratory control sample duplicate
MS = matrix spike
MSD = matrix spike duplicate
NA = not applicable

Table 7-4. Summary of Data Validation Qualification Flags for 300 Area RI/FS Groundwater Samples from New Wells

Method/Analyte(s)	Qualifier*	Affected Samples (Well)	Reason
VSR11-017			
Inorganics			
Iron	J-	B27DK9, B27DL2 (399-1-55)	Low MS/MSD recoveries
Wet Chemistry (EPA 300.0 – Anions)			
None	None	NA	NA
Radiochemistry			
None	None	NA	NA
Organics (SW-846 8260 – Volatile Organic Compounds)			
cis-1,3-dichloropropene	UJ	B266K5, B261F3 (399-1-57), B27DK9, B27DL2 (399-1-55), B28360, B28361 (399-3-33) and B27KM2 (399-1-56)	Analyte not represented by MS/MSD and LCS data
Trichloroethene Carbon tetrachloride Tetrachloroethene	UJ	B27DK9 and B27DL2 (399-1-55)	Low LCS and MSD recoveries
1,2-dichloroethene (total) cis-1,3-dichloropropene	J	B266K5 and B261F3 (399-1-57)	Low MSD recovery
Chloroform Vinyl chloride	UJ	B266K5 and B261F3 (399-1-57)	Low MSD recovery

*Qualifiers are defined in Section 6.3.
LCS = laboratory control sample
LCSD = laboratory control sample duplicate
MS = matrix spike
MSD = matrix spike duplicate
NA = not applicable

Table 7-5. Summary of Data Validation Qualification Flags for 300 Area RI/FS Aquifer Sediment Samples

Method/Analyte(s)	Qualifier*	Affected Samples (Well)	Reason
VSR11-016			
Inorganics			
Barium	J-	B28PY0 (399-3-33)	Low MS/MSD recoveries and poor MS/MSD precision
Manganese	J-	B27DL5, B27DL7 (399-1-55) and B28PN2 (399-2-32)	Low MS/MSD recoveries
Wet Chemistry (EPA 300.0 – Anions)			
None	None	NA	NA
Radiochemistry			
None	None	NA	NA
VSR11-017			
Organics (SW-846 8260 – Volatile Organic Compounds)			
cis-1,3-dichloropropene	UJ	B27F84, B27F85 (399-1-55), B28PN1 (399-2-32) and B28MJ5 (399-3-33)	Analyte not represented by MS/MSD and LCS data
VSR11-037			
General Chemistry (EPA 9060 – Total Carbon and Total Inorganic Carbon)			
Total Carbon	J	B27JR9, B27JT0 (399-2-32), B282Y0, B282X9 (399-1-54) and B28PN0 (399-2-32)	Lack of LCS data
Total inorganic carbon	J	B27JR9, B27JT0 (399-2-32), B282Y0, (399-1-54) and B28PN0 (399-2-32)	Lack of LCS data and poor lab duplicate precision
Total inorganic carbon	UJ	B282X9 (399-1-54)	Lack of LCS data and poor lab duplicate precision

*Qualifiers are defined in Section 6.3.

LCS = laboratory control sample

LCSD = laboratory control sample duplicate

MS = matrix spike

MSD = matrix spike duplicate

NA = not applicable

7.3.3 Holding Times and Preservation

Holding times are defined as the period of time from sample collection to sample analysis or extraction, and the period of time from sample extraction to sample analysis. Holding times are calculated from the date of sample collection as recorded on the chain-of-custody form to determine the validity of the results.

7.3.3.1 Inorganics

The holding time requirements for metals are as follows:

- The holding time requirements for inductively coupled plasma (ICP) and ICP/MS metals are analysis within 180 days of sample collection for both soil and water samples.
- Mercury requires analysis within 28 days of sample collection for both soil and water samples. Preservation of soil samples for mercury analysis requires chilling to 4±2°C. Preservation of water samples for metals analysis, including mercury, is acidification with nitric acid (HNO_3) to pH<2 and chilling to 4±2°C.

All samples were properly preserved and analyzed within the prescribed holding times with the following exception: one water sample, B25M25, was analyzed for mercury 21 days past the 28-day holding time limit. The mercury value for this sample was less than detectable and received a review qualifier of UR.

7.3.3.2 General Chemistry

The holding time requirements for general chemistry parameters are as follows:

- All anions except nitrate, nitrite, and phosphate – analysis within 28 days of sample collection
- Nitrate, nitrite, and phosphate – analysis within 48 hours of collection for water samples and extraction within 28 days of collection and analysis within 48 hours of extraction for soil samples
- Alkalinity – analysis within 14 days of sample collection
- Cyanide - analysis within 14 days of sample collection for both soil and water samples
- Total carbon and total inorganic carbon – 28 days for both soil and water matrices

Sample preservation for anions and alkalinity requires chilling the groundwater and soil samples to 4±2°C. Cyanide requires preservation of water samples with sodium hydroxide (NaOH) to pH >12 and chilling to 4±2°C. Total carbon and total inorganic carbon requires preservation with sulfuric acid (H_2SO_4) to pH <2 (water matrix only) and chilling to 4±2°C (both soil and water). All samples were properly preserved and analyzed within the prescribed holding times with the following exceptions:

Three soil samples for total carbon and total inorganic carbon (samples B261D6, B261D7, and B27JR9) were analyzed outside of holding time. All samples were run within 3 days of the 28-day holding time and values are not expected to be significantly affected.

7.3.3.3 Radionuclides

The maximum holding time for radiochemical analysis is 180 days for both soil and water samples. Sample preservation for water samples requires acid preservation with nitric acid to pH less than 2. There are no specific preservation requirements for radiochemical soil analysis.

All samples were properly preserved and analyzed within the prescribed holding times.

7.3.3.4 Organics

The holding times and preservation requirements for VOCs and semi-volatile organic compounds (SVOCs) are as follows:

- VOCs (water) – acidify with hydrochloric acid (HCl) or sulfuric acid (H_2SO_4) to pH<2, cool to 4±2°C, and analyze within 14 days of collection; if samples are not acidified, but cooled to 4±2°C, analyze within 7 days of collection.
- VOCs (soil) – Low level - freeze samples and analyze within 14 days. High level - preserve samples in methanol, cool to 4±2°C, and analyze within 14 days of collection. If samples (low or high level) are not frozen or preserved, but cooled to 4±2°C, analyze within 48 hours of collection.
- SVOCs (water and soil) - cool to 4±2°C, and extract within 14 days of collection. Analysis within 40 days from extraction.

All groundwater and soil samples were properly preserved and analyzed within the prescribed holding time.

8 Field Quality Control

8.1 Field Quality Control Sampling Requirements

The 300 Area SAP (DOE/RL-2009-45) required collection of full trip blank (FTB) samples, field transfer blank (FXR) samples, equipment rinsate (EB) samples, field duplicate samples (DUP), and split samples. Table 8-1 summarizes the required frequency for each field QC sample type.

Table 8-1. Project Quality Control Checks

QC Sample Type	Purpose	Frequency
Field Quality Control		
Full trip blank	Assess contamination from containers or transportation	One per 20 samples per media sampled.
Field transfer blank	Assess contamination from sampling site	One per day when volatile organic compounds are sampled for groundwater monitoring activities. A minimum of one field transfer blank will be collected at each borehole *per media sampled* where the sample will undergo volatile organic analysis.
Equipment rinsate blank	Verify adequacy of sampling equipment decontamination	If disposable equipment is used or equipment is dedicated to a particular well, then an equipment rinsate blank is not required. Otherwise, 1 per 20 samples per media sampled.
Field duplicate	Estimate precision, including sampling and analytical variability	One per batch, 20 samples maximum, for groundwater monitoring activities. A minimum of one field duplicate will be collected at each borehole *per media sampled*.

Table 8-1. Project Quality Control Checks

QC Sample Type	Purpose	Frequency
Split sample	Estimate precision, including sampling, analytical, and inter-laboratory variability	At a minimum, one per analytical method, per media, for analyses performed where detection limit and precision and accuracy criteria have been defined in the Performance Requirements Tables.

8.1.1 Field Blank Requirements

Full trip blank (FTB) samples are samples prepared by the sampling team before traveling to the sampling site. The preserved bottle set is identical to the set collected in the field, but it is filled with reagent water or silica sand, as appropriate to the primary sample media. The bottles are sealed and transported, unopened, to the field in the same storage container used for samples collected the same day. Full trip blanks are typically analyzed for the same constituents as the samples from the associated sampling event. However, the analytical list for full trip blanks on soil may be limited to volatile organic analysis, semivolatile organic analysis, and total petroleum hydrocarbons, depending on resolution/determination of the target analyte list. Full trip blanks are not required on aquifer sediments being analyzed for metals, mercury, and hexavalent chromium.

FXR samples are preserved volatile organic analysis sample containers filled at the sample collection site with reagent water or silica sand (as appropriate to the primary sample media) transported to the field. The samples are prepared during the sampling to evaluate potential contamination caused by field conditions. After collection, field transfer blank bottles are sealed and placed in the same storage container with the samples from the associated sampling event. The field transfer blank samples are analyzed for VOCs only, and are batched with samples for which volatile organic analysis is being requested.

Equipment rinsate blank (EB) samples are collected for sampling devices reused to assess the adequacy of the decontamination process. Equipment rinsate blanks will consist of silica sand or reagent water poured over the decontaminated sampling equipment and placed in containers, as identified on the project sampling authorization form. If disposable (i.e., single-use) equipment is used, equipment blanks are not be required.

Field blank (i.e., full trip blank, field transfer blank, and equipment rinsate blank), results exceeding two times the MDL are identified as suspected contamination. However, for common laboratory contaminants such as acetone, methylene chloride, 2-butanone, toluene, and phthalate esters, the limit is five times the MDL. For radiological data, blank results are flagged if they are greater than two times the total MDA.

8.1.2 Field Duplicate Requirements

Field duplicate samples are used to evaluate sample consistency and the precision of field sampling methods. Field duplicates are independent samples that are collected as close as possible to the same point in space and time. They are two separate samples taken from the same source, stored in separate containers, and analyzed independently.

The duplicate should be collected generally from an area expected to have some contamination so valid comparisons between the samples can be made (e.g., at least some of the constituents will be above the detection limit). When sampling is performed from a split spoon, VOC samples and VOC duplicate

samples are collected directly from the sampler. The remaining soil/aquifer sediment is then composited in a stainless steel mixing bowl. The soil/aquifer sediment sample and duplicate sample are collected from this composited material.

Evaluation of the results can provide an indication of intra-laboratory variability. Large relative percent differences (RPDs) can be an indication of laboratory performance problems and should be investigated. Only those field duplicates with at least one result greater than five times the MDL or MDA are evaluated.

8.1.3 Split Sample Requirements

A field split sample is a representative sample from a sampling event sent to a third party laboratory (i.e., reference laboratory). Evaluation of the results can provide an indication of inter-laboratory variability. Large RPDs can be an indication of laboratory performance problems and should be investigated. Only those results at least one result greater than five times the MDL or MDA at one or both laboratories are evaluated.

8.2 Field Quality Control Results

Field trip blank samples are analyzed to determine if positive results may be attributed to contaminants introduced as a result of the transfer of samples from the field to the laboratory. Any analyte measured above the laboratory detection limits is evaluated for potential impacts to associated sample results.

A total of 43 FTB samples were taken in association with the Spatial and Temporal Uncertainty Monitoring Well Water Samples and the Water Samples from New Wells. Of the 606 analytical results associated with the FTB samples, 14 results (2 percent) were observed above laboratory MDLs. These analytes were arsenic (1 sample), copper (3 samples), fluoride (1 sample), nitrogen in nitrate (1 sample), selenium (1 sample), sulfate (1 sample), tritium (2 samples), uranium (1 sample), uranium-233/234 (2 samples), uranium-235 (1 sample), and uranium 238 (1 sample). With the exception of the detects for sulfate and nitrogen in nitrate, all positive FTB results were either B flagged by the laboratory as estimates (metals) or near lab detection limits (radiochemical results). Of the detected analytes, only arsenic was detected at a value above the action limit and none of the detected values are significant enough to impact usability of associated sample values. Two FTB samples were taken in association with the aquifer sediment samples. Of the 14 analytical results associated with the FTB samples, there were no positive results reported.

In addition to full trip blanks, FXR samples were collected specifically for VOA samples. In total, 391 FXR samples were taken in association with the Spatial and Temporal Uncertainty Monitoring Well Water Samples and the Water Samples from New Wells. Of the 2,303 results reported, 25 results (1 percent) were observed above laboratory MDLs. Of the 25 positive values, 18 were flagged as estimates. The majority of the detectable values (20) were carbon tetrachloride. All of the carbon tetrachloride values reported exceeded the action limits listed in Table 6-1; however, none of the results were associated with a detected value in a related sample event.

A total of 25 FXR samples were taken in association with the Aquifer sediment samples. Of the 173 analytical results associated with the FXR samples, there were no positive results reported.

EB samples were taken with the Spatial and Temporal Uncertainty Monitoring Well Water Samples and the Aquifer Sediment Samples.

A total of 9 EB samples were taken in association with the Spatial and Temporal Uncertainty Monitoring Well Water Samples. Of the 88 analytical results associated with the EB samples, 13 results (14 percent)

were observed above laboratory MDLs. These analytes were cadmium (1 sample), chloroform (1 sample), copper (2 samples), lead (2 samples), manganese (1 sample), nickel (1 sample), nitrogen in nitrate (1 sample), thallium (1 sample), uranium-233/234 (1 sample), and zinc (2 samples). Of the detected analytes, only thallium was detected at a value above the action limit and the associated sample was measured at a value below that observed in the EB. Of the remaining data points, none of the detected values are significant enough to impact usability of associated sample data.

A total of 3 EB samples were taken in association with the Aquifer Sediment Samples. Of the 34 analytical results associated with the EB samples, 10 results (29 percent) were observed above laboratory MDLs. All of the positive results originated from one sample event. The analytes that exceeded the criteria were barium, copper, lead, manganese, selenium, total carbon, uranium, uranium-233/234, uranium-235, and uranium-238. None of the analytes were detected at a value above the lowest cleanup goal and, with the exception of selenium, none of the detected values are significant enough to impact usability of associated sample values. The selenium result was also associated with laboratory blank contamination and the EB result and all associated sample results were flagged C by the laboratory. Field duplicate samples were required to be collected at a frequency of not less than 1 per 20 field samples for spatial and temporal uncertainty monitoring well water samples and water samples from new wells. Field duplicate samples were obtained from the same sample interval using the same equipment and sampling technique as their corresponding primary field sample. The field duplicate sample was analyzed for the same COPCs at the same laboratory that analyzed the primary field samples. Duplicate pair results were evaluated if at least one of the two results was greater than 5 times the MDL or minimum detectable concentration (MDC). Of the 1,017 data sets evaluated, 3 exceeded the RPD criteria: iron (1 sample set), and manganese (2 sample sets).

9 Laboratory Quality Control

In addition to the evaluation performed on field quality control data (as described in Section 8), a broad review of the laboratory QC results was also conducted. Laboratory QC results were stored electronically in HEIS for the data and were evaluated using various database queries against the acceptance criteria. Table 9-1 provides a summary of the laboratory QC acceptance criteria used.

Table 9-1. Laboratory QC Acceptance Criteria

QC Element	Acceptance Criteria
Laboratory Duplicate Samples	Laboratory duplicate samples with at least one result greater than 5 times the MDL or MDC must have an RPD less than or equal to 20% for water and 30% for solid matrixes to be considered acceptable.
Laboratory Blank Samples	Laboratory blank limit is 2 times the MDL, IDL, or MDC. However, for common laboratory contaminants acetone, methylene chloride, 2-butanone, toluene, and phthalate esters, the QC limit are 5 times the MDL or MDC.
LCSs	LCS percent recovery must be between the upper and lower control limits listed in the 300 Area SAP (DOE/RL-2009-45) and are listed in Tables 6-1 through 6-3.

Table 9-1. Laboratory QC Acceptance Criteria

QC Element	Acceptance Criteria
Matrix Spikes/Matrix Spike Duplicates (where applicable)	Laboratory spikes where the sample result is less than or equal to 4 times the spiking concentration are evaluated by comparing the percent recovery with the upper and lower control limits provided by the laboratory. In addition, where the sample result is less than or equal to 4 times the spiking concentration, the MS/MSD RPD must have an RPD less than or equal to 20% for water and 30% for soil matrices. Spike values not applicable when sample result is > 4 times the spiking concentration.
Surrogates (where applicable)	Surrogate percent recovery within laboratory established statistical control limits.

Source: DOE/RL-2009-45, *300 Area Remedial Investigation/Feasibility Study Sampling and Analysis Plan for the 300-FF-1, 300-FF-2 and 300-FF-5 Operable Units*.

IDL = instrument detection limit

LCS = laboratory control limit

MDC = minimum detectable concentration

MDL = method detection limit

MS = matrix spike

MSD = matrix spike duplicate

RPD = relative percent difference

9.1 Laboratory Contamination

Hanford Site laboratory contracts require that laboratory method blanks be analyzed with each batch of up to 20 samples. A total of 4,822 laboratory blank results were reported for these blanks. Greater than 99 percent of the results satisfied evaluation criteria. Nonconformances were limited to 21 results (0.43 percent), which were mainly attributed to copper (5 results), uranium 238 (5 results), trichloroethene (4 results), and lead (2 results). The remainder with one result each were arsenic, selenium, thorium, total carbon, and total uranium (by ICP-MS). All blank values which exceeded evaluation criteria (Table 9-1) were observed at concentrations below the laboratory quantitation limits, and the laboratory-applied C flags to the associated sample data were appropriate. Associated sample data for the selenium and trichloroethene were also qualified as nondetected at the laboratory quantitation limit during third party validation (as summarized in Table 10-1).

9.2 Laboratory Precision

Laboratory precision is determined by the difference between duplicate sample pair results or between MS/MSD sample results. Normally, spike duplicates are used for metals and anions while duplicate sample pairs are analyzed for organic analyses.

A total of 3,429 duplicate and or MS/MSD pairs were evaluated. Greater than 99 percent of the results satisfied evaluation criteria. A total of 18 sample pairs exceeded the RPD limits. Of these observed failures, 9 occurred in soil matrixes where sample homogeneity is more problematic. The majority (7) of RPD exceedances in soil were associated with total inorganic carbon; one with total carbon and one with manganese. Of the remaining 9 that exceeded criteria, 5 were associated with uranium-235, 2 with ion chromatography, 1 with total uranium, and 1 with carbon tetrachloride. No data user or third party

validation flags were applied to these data points; however, in some instances an X flag was applied to the data by the laboratory to note the RPD exceedances.

9.3 Accuracy

Three types of QC are used to assess accuracy. The LCS is used to assess the performance of the laboratory with respect to the method and the accuracy of the laboratory preparation and analysis processes. The MS samples are used to assess the accuracy of the published method on the sample matrix and evaluate matrix effects that may bias the data. Laboratory surrogate recoveries are used to assess overall method performance for organic methods.

9.3.1 Laboratory Control Samples

A total of 4,332 LCS results were reported. Greater than 99 percent of the results satisfied evaluation criteria with 57 LCS values reported outside the analytical performance requirements. Of the 57 values outside performance requirements, 26 were related to volatile organic analysis (VOA) and 18 of those were specifically trichloroethene in water samples. All 18 of the trichloroethene LCS results were below the 80 percent analytical performance requirement acceptance criteria; they were all within laboratory statistical performance limits. Also, 21 values were related to antimony in soil which, while falling above the 130 percent analytical performance requirement, was within the laboratory statistical control levels established for the method.

9.3.2 Matrix Spike Recovery

Matrix spike recovery is also used as a measure of analytical accuracy. There were a total of 2,555 matrix spike sample results reported. Of those, only 51 results (2 percent) did not satisfy the analytical performance requirements. Of those 51 results, 22 were related to metals analysis. Thallium had the highest number of values exceeding criteria at 10 and manganese next highest at 6. The remaining values that exceeded criteria were related to VOA analysis, trichloroethene having the largest number that exceeded at 13 (6.5 percent of all trichloroethene spikes); however, while below the 80 percent analytical performance requirement acceptance criteria, they were all within laboratory statistical performance limits.

9.3.3 Surrogate Recovery

Surrogates were analyzed in relation to methods 8260 VOA and 8270 SVOA. A total of 2052 VOA surrogate results were evaluated. Greater than 99 percent of the results were satisfactory, with only 8 values reported outside the laboratory statistical control limits. Failures were on samples B25M09 (Toluene-d8 – potential low bias for results associated with this surrogate), B25LT6 (4-fluorobromobenzene), B29KY5 (Toluene-d8), B29KW3 (1,2-dichloroethane-d4), B29KY5 (4-fluorobromobenzene, 1,2-dichloroethane-d4), and a batch QC sample (Toluene-d8). With the exception noted for sample B25M09 above, evaluation of the associated samples indicated no sample values were impacted or qualified as a result of these surrogate results.

A total of 919 SVOA surrogate results were evaluated. Greater than 96 percent of the results were satisfactory, with a total of 32 values reported outside the laboratory statistical control limits. None of the surrogates were directly related to the one COPC SVOA (tributyl phosphate), however, and are not expected to have a negative effect on reported results.

9.4 Review of Laboratory QC Information

Laboratory data package case narratives were reviewed to identify potential QC issues that would affect the usability of these data. Overall, no issues were identified that would have led to the rejection of any reported results. Some minor data quality issues were identified in the case narratives.

10 Data Usability Conclusions

The assessment noted some deficiencies in the data. These deficiencies are summarized in the following subsections.

10.1 Data Verification Considerations

Based on the review performed in this DQA, all required samples and field QC were collected in accordance with the 300 Area SAP (DOE/RL-2009-45). In addition, the analytical data sets are complete, and analyses were performed according to the contractually required analytical methodology.

10.2 Data Validation Considerations

A minimum of 5 percent of the data collected were subjected to a rigorous third party validation. Most of the observed QC deficiencies were minor and were not considered by the validators to limit the utility of the data for decision making. Values for those constituents listed as "J" or "UJ" flagged should be considered estimated but usable. The main validation observations are provided in Table 10-1.

Table 10-1. Validation Observations

Deficiency	Qualification	Analyte	Sample(s)
Low MS and/or MSD recovery	Results are estimates	Thallium	B25M24, B25M25, B25M59, B25M60, B25PR7, B25PR6, B25PT1, B25PT5, B286K2, B286K3, B286D3
		Iron	B27DK9, B27DL2
		Barium	B28PY0
		Manganese	B27DL5, B27DL7, B28PN2
		Chloride	B25M92, B25M94, B25M95
		Trichloroethene	B27DK9, B27DL2
		Carbon tetrachloride	B27DK9, B27DL2
		Tetrachloroethene	B27DK9, B27DL2
		1,2-dichloroethene	B266K5, B261F3

Table 10-1. Validation Observations

Deficiency	Qualification	Analyte	Sample(s)
		cis-1,3-dichloropropene	B266K5, B261F3
		Chloroform	B266K5, B261F3
		Vinyl chloride	B266K5, B261F3
Laboratory blank contamination	Nondetect	Selenium	B26M14, B26M15
		Trichloroethene	B286D1, B28D23
Low surrogate recoveries	Results are estimates	Carbon tetrachloride	B286B6, B28D45, B286C6, B286C1, B286D6, B286D1
Lack of LCS data and/or poor duplicate precision	Results are estimates	Total carbon	All results
		Total inorganic carbon	All results
Lack of analyte representation in the MS/MSD and LCS	Results are estimates	cis-1,3-dichloropropene	B266K5, B261F3, B27DK9, B27DL2, B28361, B27KM2, B27F84, B27F85, B28PN1, B28MJ5

One of the QC deficiencies was considered by the validator to limit the utility of the data for decision making and was flagged "UR" (sample B25M25 well 699-13-1A) based on a missed holding time (result was determined outside 2X the 28-day holding time). This result was initially reported as a nondetect but should be considered to have a low bias and unusable for the purposes of this study.

10.2 Conclusions

Based on the results of this DQA, the sample set is complete and there is a low overall degree of suspect (flagged) data points. Given the high degree of acceptable data, the analytical results (general chemistry, inorganic, organic, and radiochemical) are considered useable for their intended purposes as indicated in Section 2.0. Samples were collected and analyzed as specified in the 300 Area SAP (DOE/RL-2009-45). Sample results accurately indicate the presence or absence of target analyte contamination at sample locations. Laboratory and matrix accuracy and precision are in control overall and no systematic or general discrepancies were displayed. Sample results are believed to be representative of site conditions at the time of collection. Results obtained are comparable to industry standards in that collection and analytical techniques followed approved, documented procedures (except as noted in this report and reflected in qualified data points). All results are reported in industry standard units. Although some blank contamination occurred (most frequently associated with metals and isotopic uranium), the concentrations were generally low-level and were consistent with normal laboratory and field procedures.

Detection limits, precision, accuracy, and data completeness were evaluated to determine whether any analytical data should be rejected as a result of QA/QC deficiencies. The conclusions of this DQA are that, with the exception of one mercury result (sample B25M25, well 699-13-1A) that was qualified as rejected, the data that have been collected are of the right type, quality, and quantity for direct regulatory use (for example, remedial assessment).

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Appendix E
Nature and Extent Supporting Information

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E1. Uranium Concentration Trend Charts E-1

E2. Residual Contamination beneath 300-FF-2 Interim Closed Out Waste Sites E-1

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Table

Table E-1. Analytes Detected Above Background in Soil Samples Used for Waste Site Reclassification in 300 Area E-23

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E1 Uranium Concentration Trend Charts

The following uranium concentration trend charts for 300 Area Industrial Complex groundwater were prepared using the Data Viewer and Evaluator (DaVE) software interface with the Hanford Environmental Information System (HEIS). The wells included monitor groundwater in the upper portion of the unconfined aquifer, where essentially all uranium contamination resides. The time period for sample collection dates is January 1, 1992 through August 31, 2011. Analytical results with a "Y" review qualifier (i.e., result is not considered representative of aquifer conditions) are shown with an "X" symbol. The trend charts were updated with a query run on May 2, 2012.

E2 Residual Contamination beneath 300-FF-2 Interim Closed Out Waste Sites

Waste sites in the 300 Area NPL Site source OUs that have been reclassified to "closed out," "interim closed out," or "no action" were evaluated to document the occurrence of analyte results greater than Hanford Site or Washington State background concentrations in soil data used for site reclassification. Radionuclide background concentrations are obtained from *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12). Anthropogenic radionuclide background concentrations were only considered for overburden or other surficial soil sample results. Nonradionuclide background concentrations are obtained from *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes* (DOE/RL-92-24); in the case where no soil background concentration is available in DOE/RL-92-24, Washington State background concentrations from *Natural Background Soil Metals Concentrations in Washington State* (Ecology Publication 94-115) are used. Some metals (e.g., hexavalent chromium, strontium, and tin) do not have an established soil background concentration. Any detection of these metals in the reclassification soil data is noted in Table E-1.

E3 References

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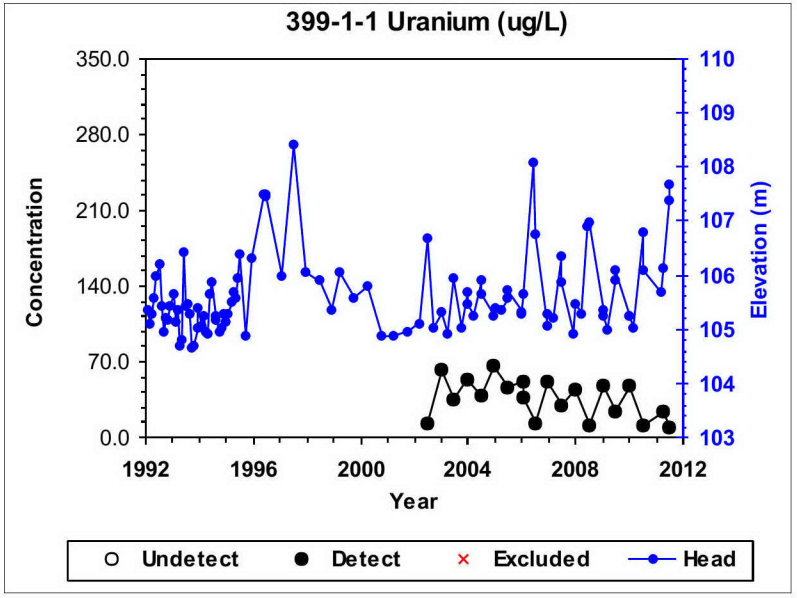
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Concentration
Elevation (m)
Year
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280.0
210.0
140.0
70.0
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108
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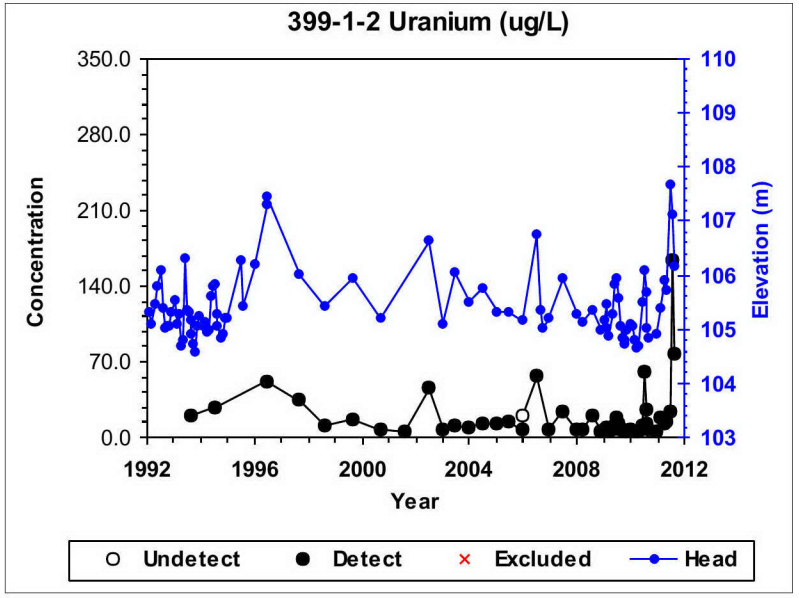
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head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Concentration
Elevation (m)
Year
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70.0
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105
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1992
1996
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2004
2008
2012
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Detect
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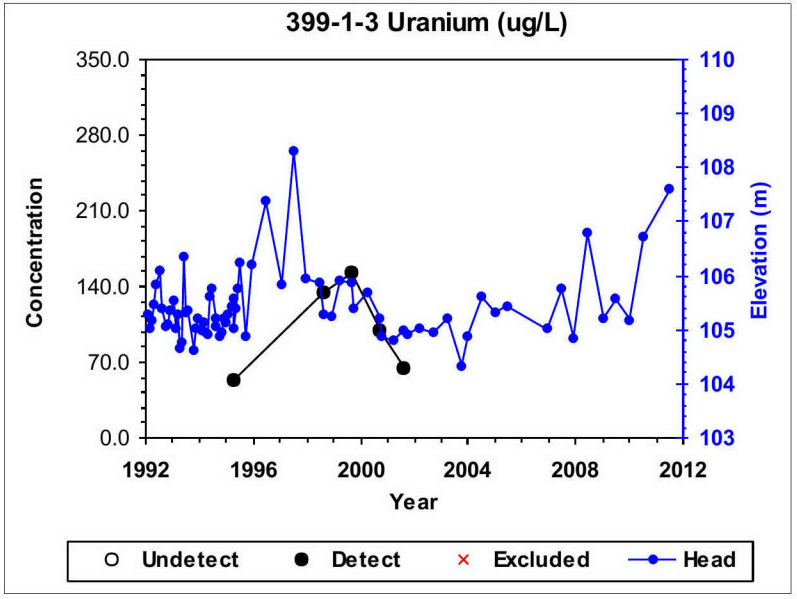
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Concentration
Elevation (m)
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70.0
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1992
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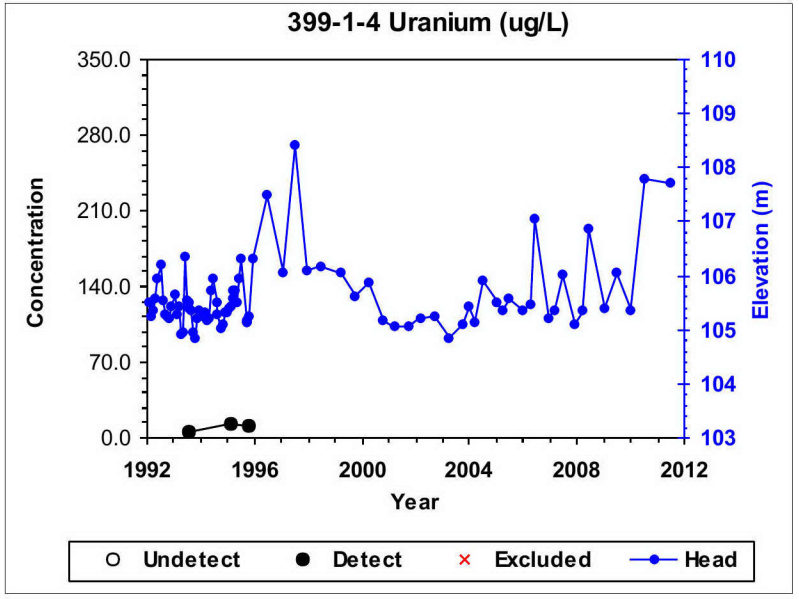
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Elevation (m)
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Detect
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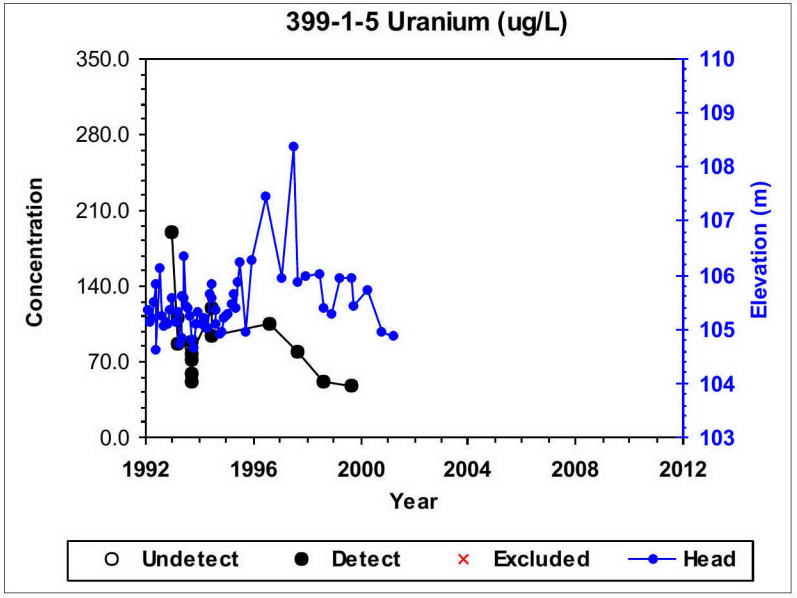
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210.0
140.0
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1992
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Undetect
Detect
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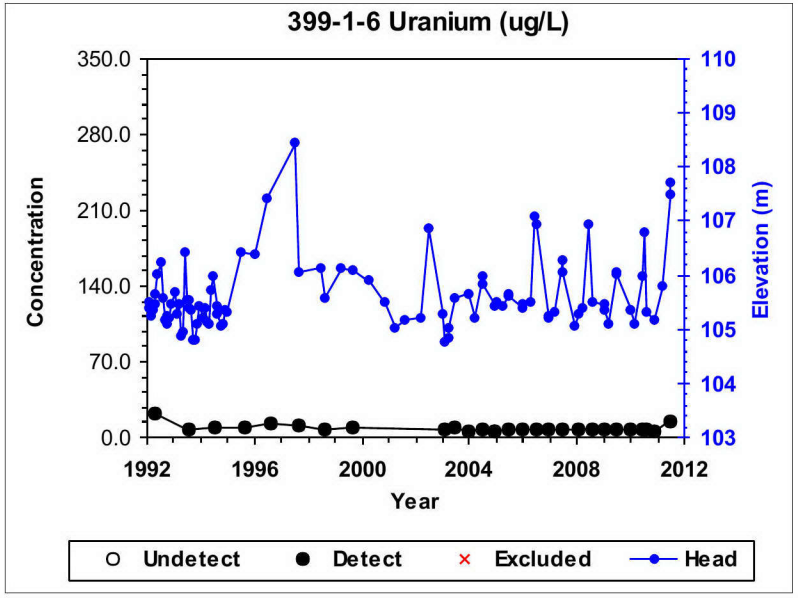
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Concentration
Elevation (m)
Year
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210.0
140.0
70.0
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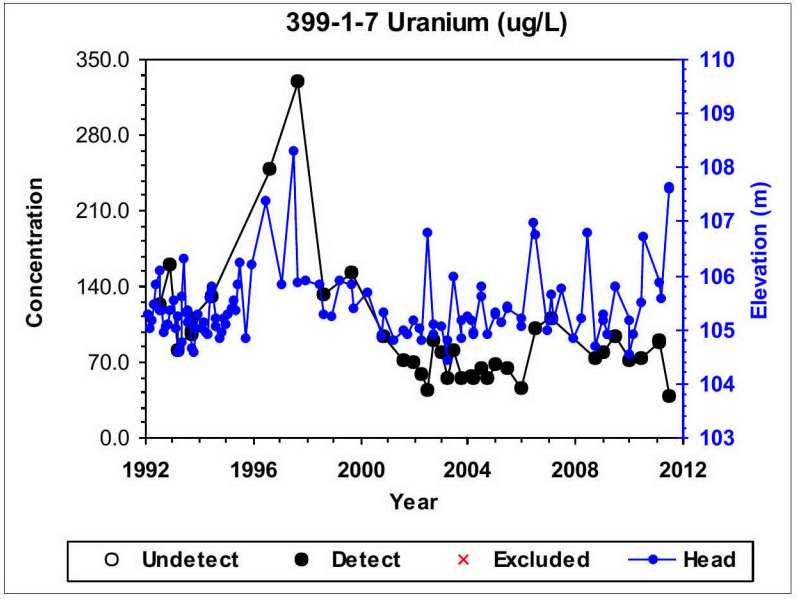
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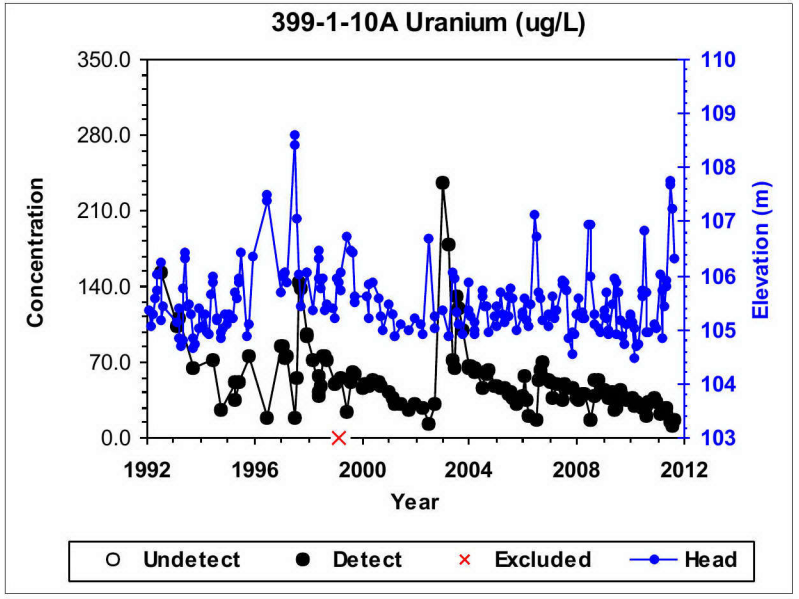
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2012
Undetect
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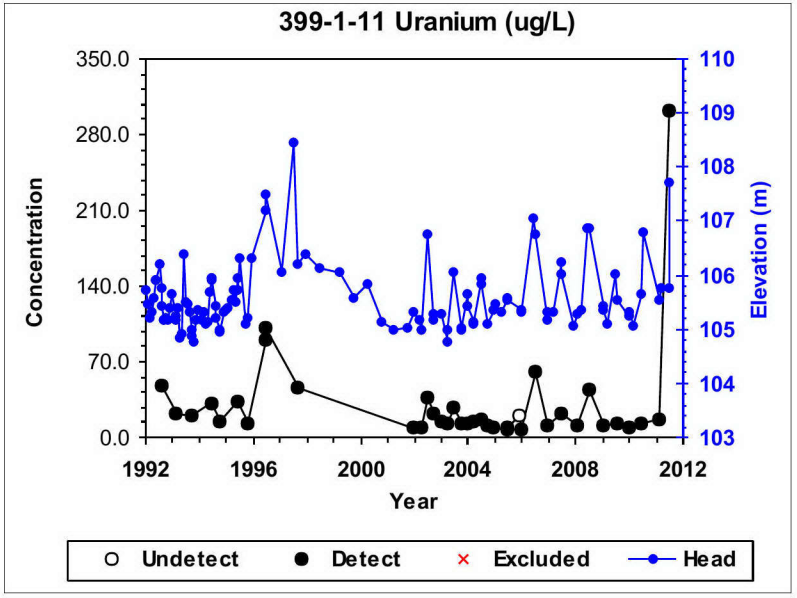
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Year
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Detect
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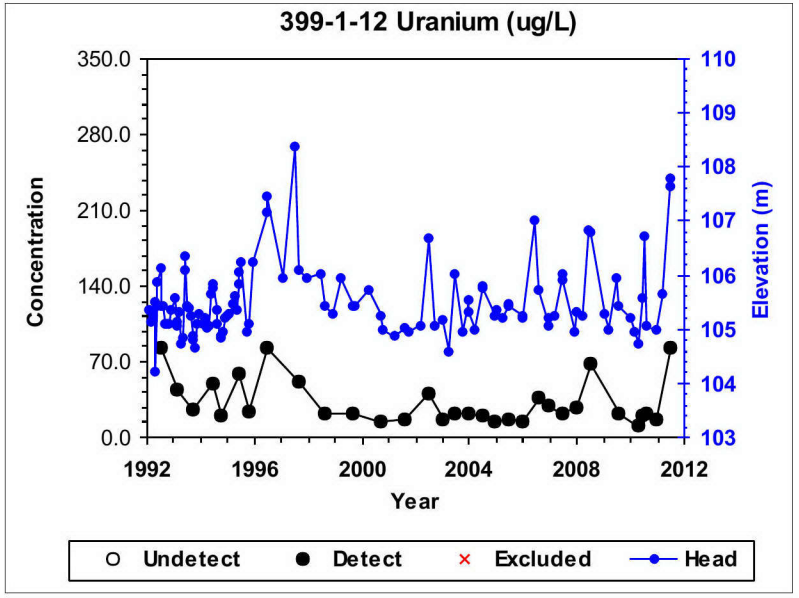
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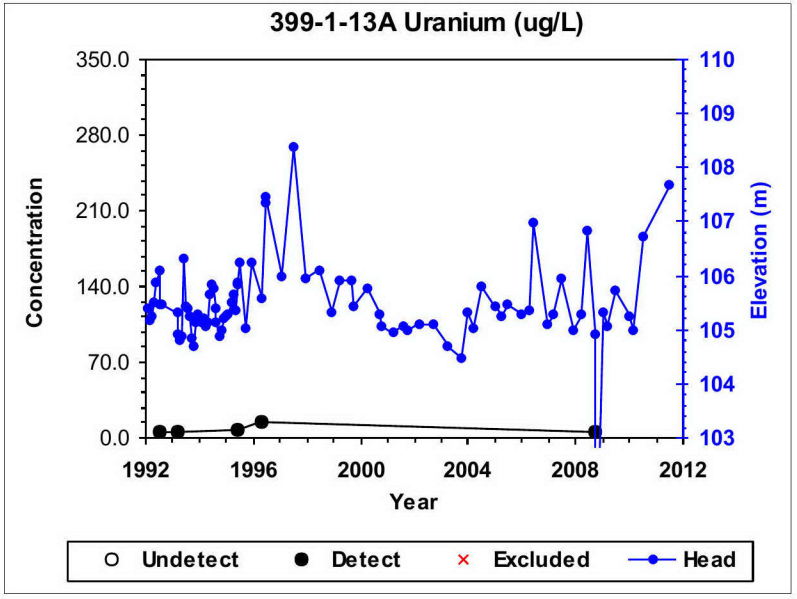
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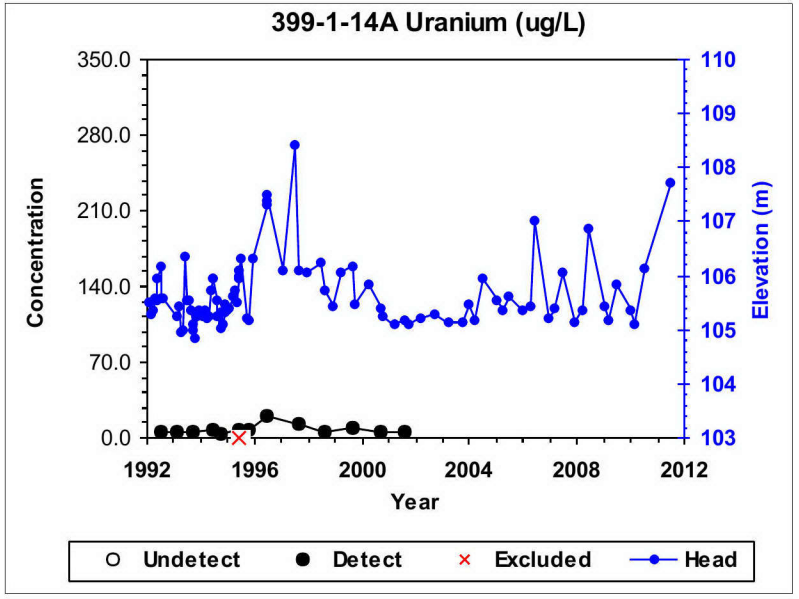
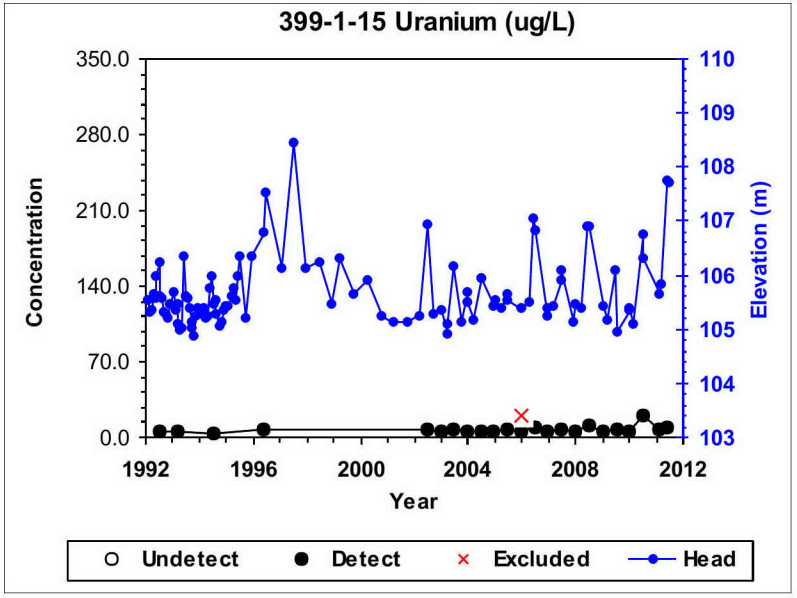
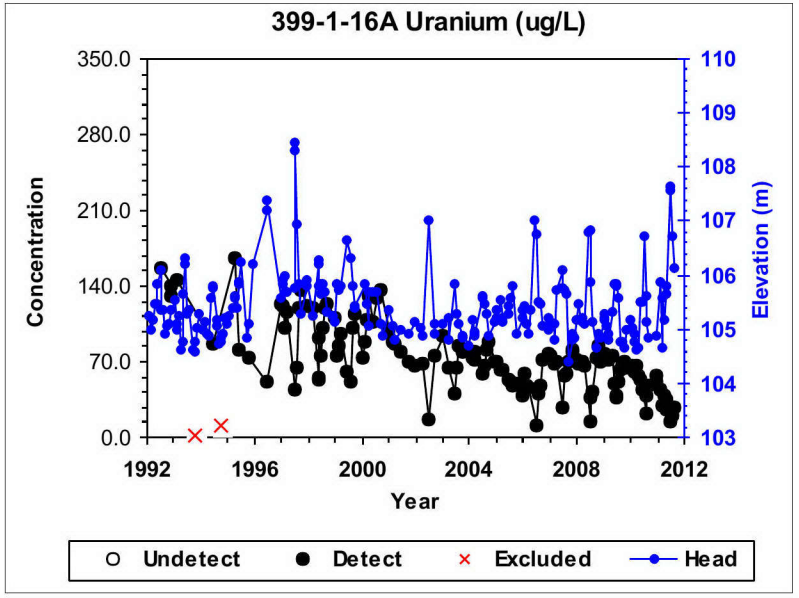
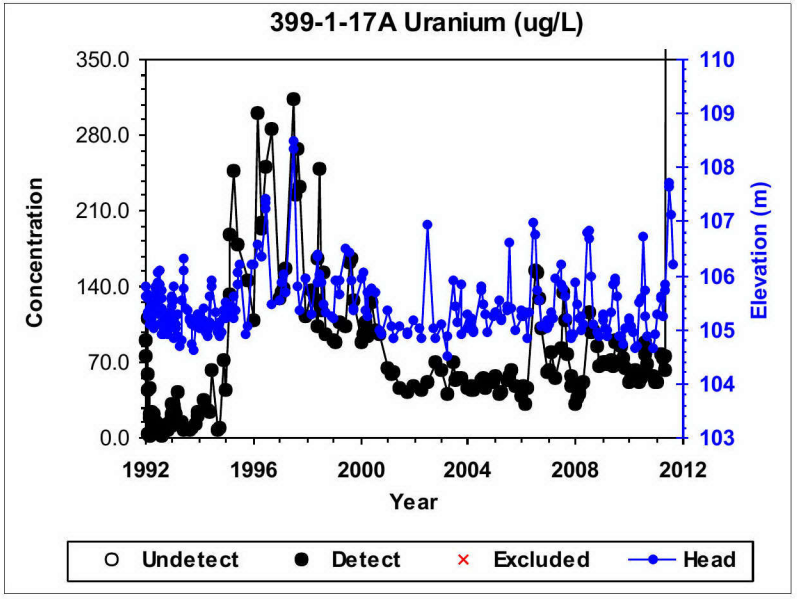
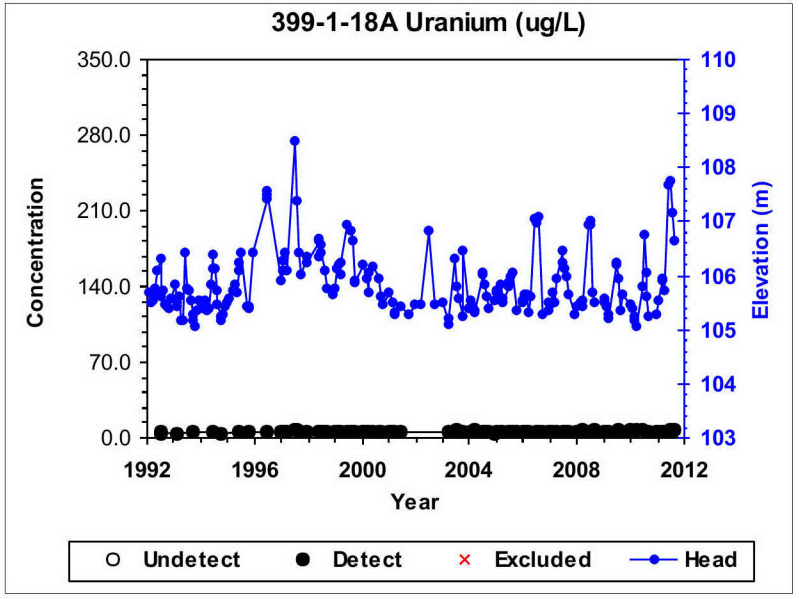
2012
Undetect
Detect
Excluded
Head

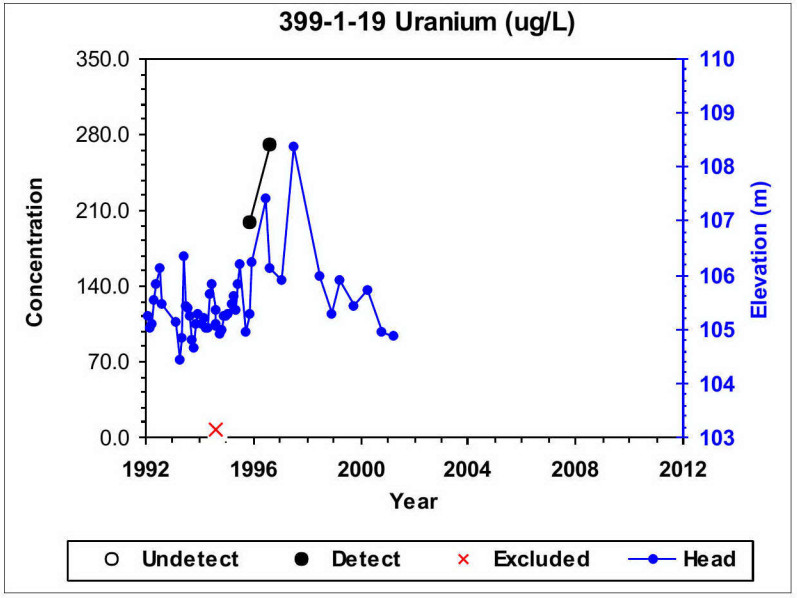

399-1-14A Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

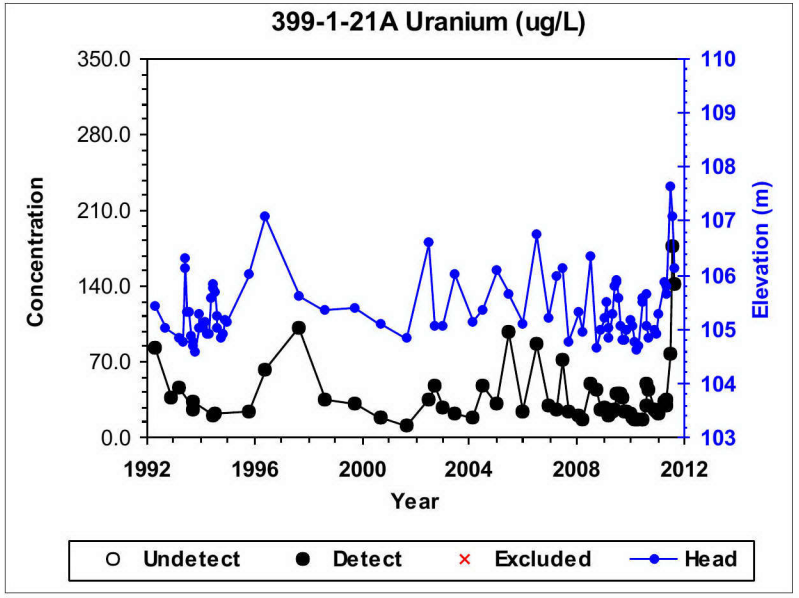

399-1-15 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

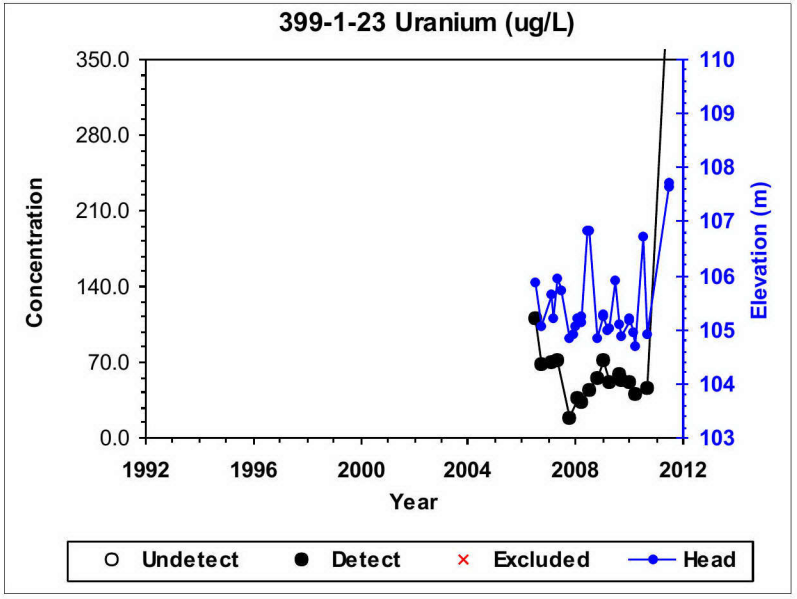

399-1-16A Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

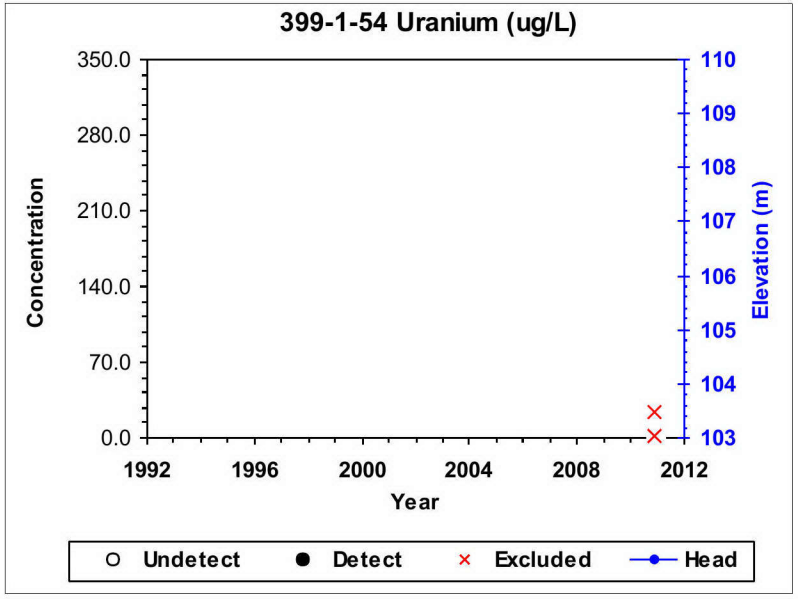

399-1-17A Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

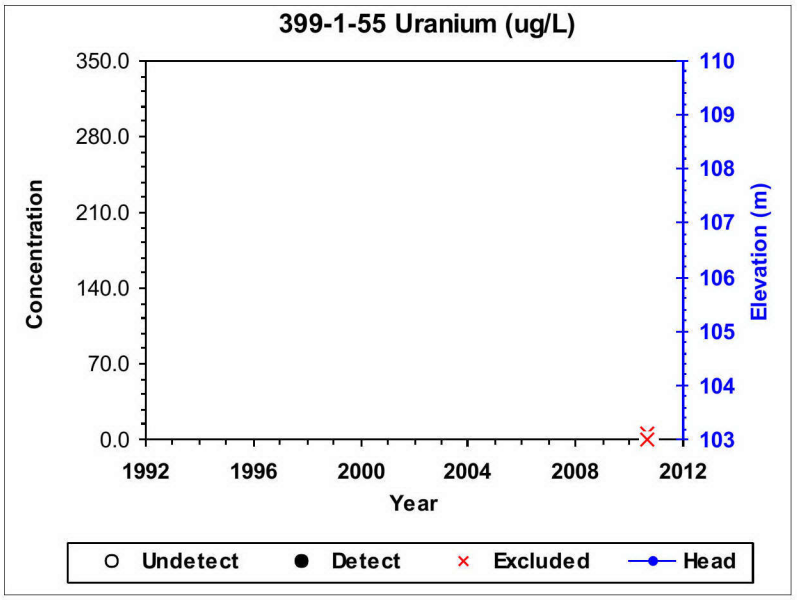

399-1-18A Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

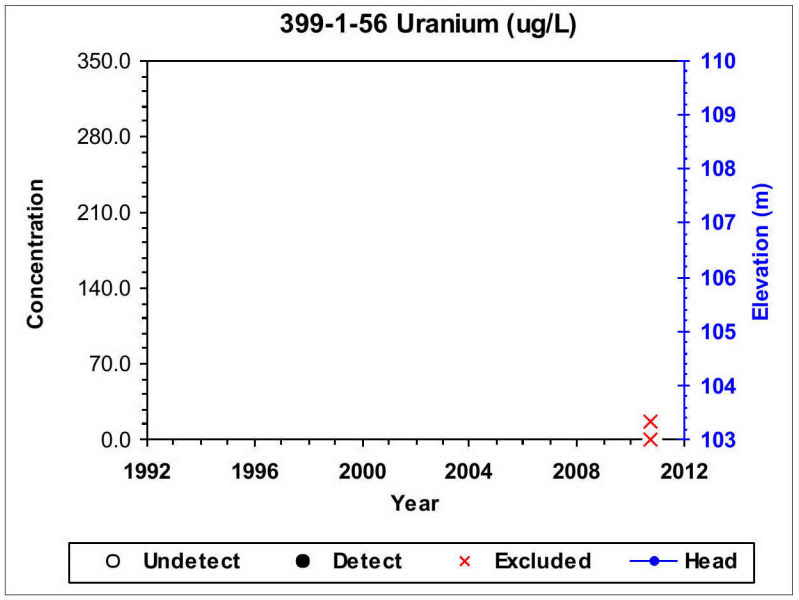

399-1-19 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

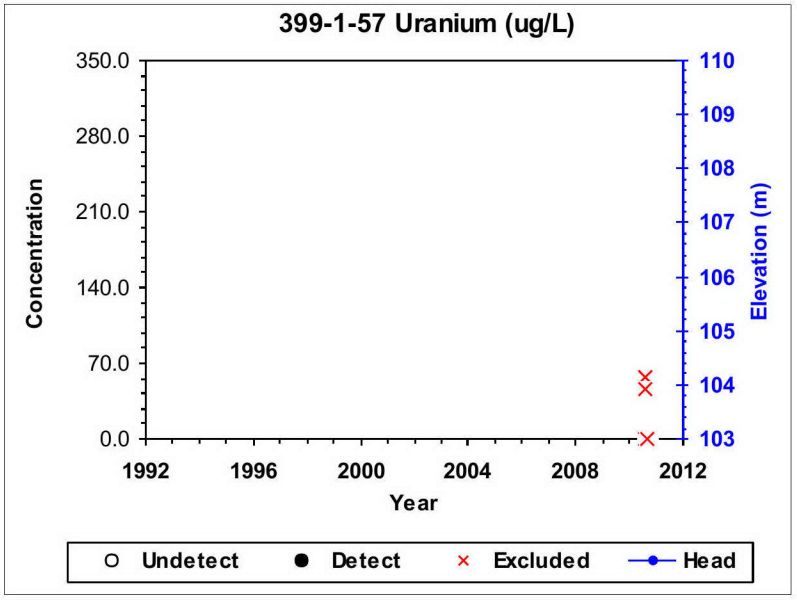

399-1-21A Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

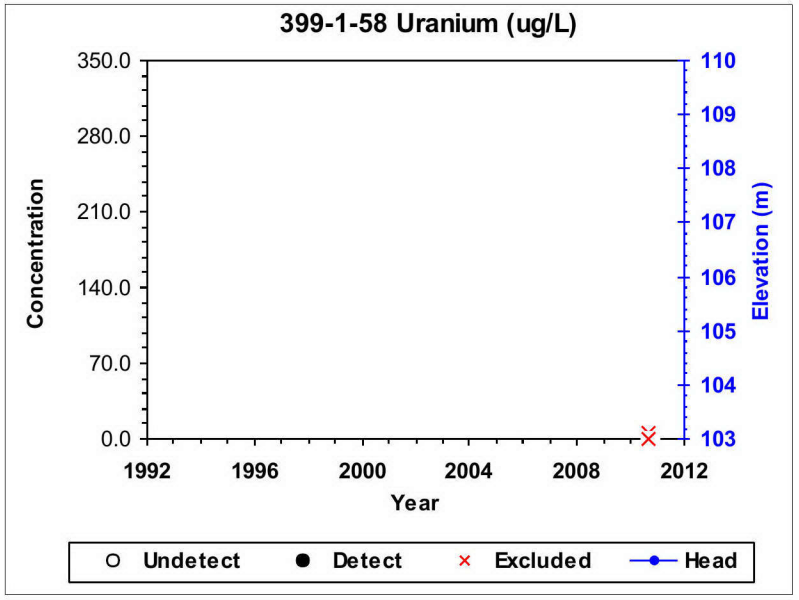

399-1-23 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

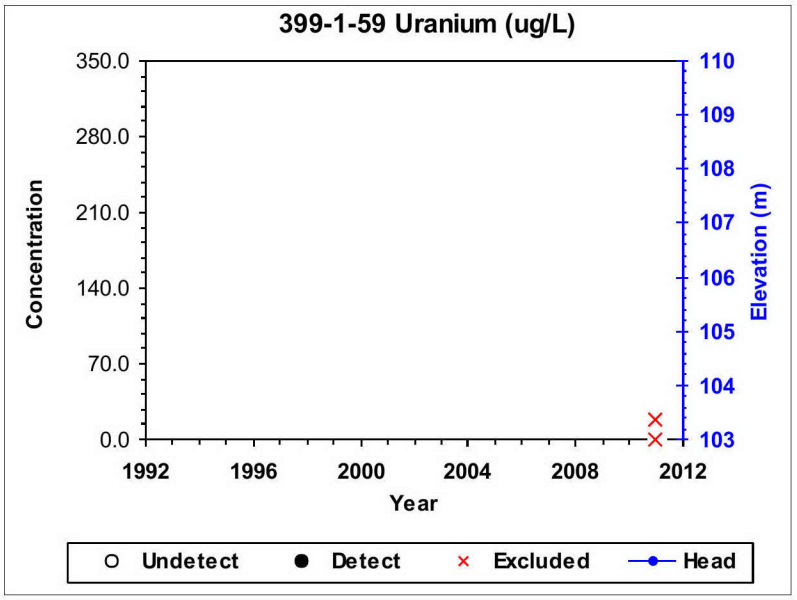

399-1-54 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

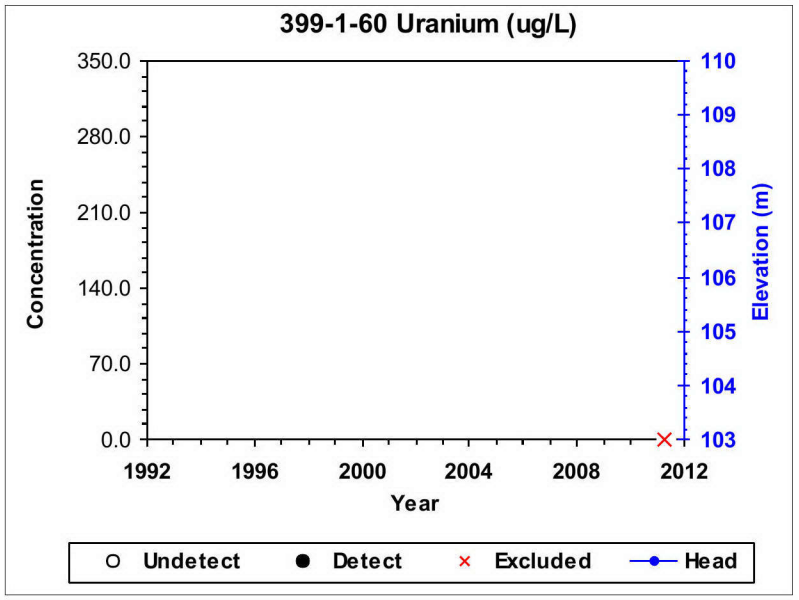

399-1-55 Uranium (ug/L)
Concentration
350.0
280.0
210.0
140.0
70.0
0.0
1992
1996
2000
2004
2008
2012
Year
110
109
108
107
106
105
104
103
Elevation (m)
Undetect
Detect
Excluded
Head

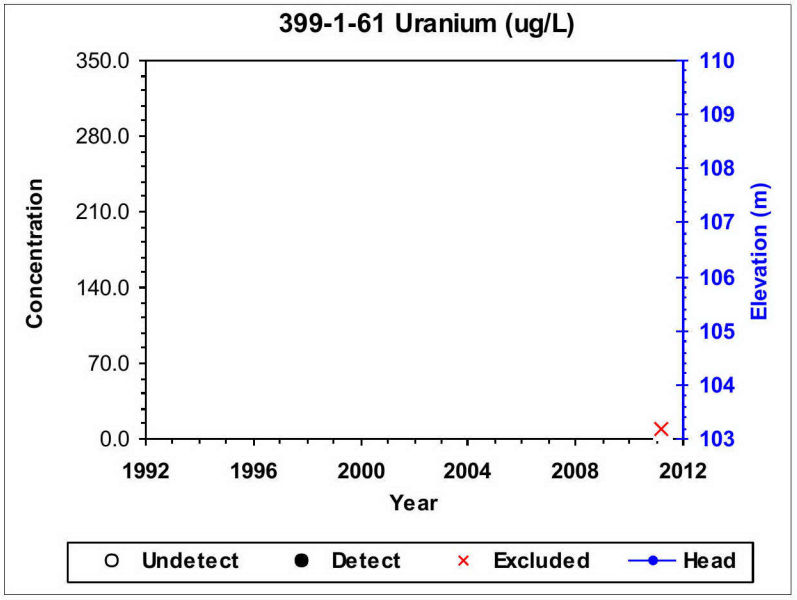

399-1-56 Uranium (ug/L)
Concentration
350.0
280.0
210.0
140.0
70.0
0.0
1992
1996
2000
2004
2008
2012
Year
110
109
108
107
106
105
104
103
Elevation (m)
Undetect
Detect
Excluded
Head

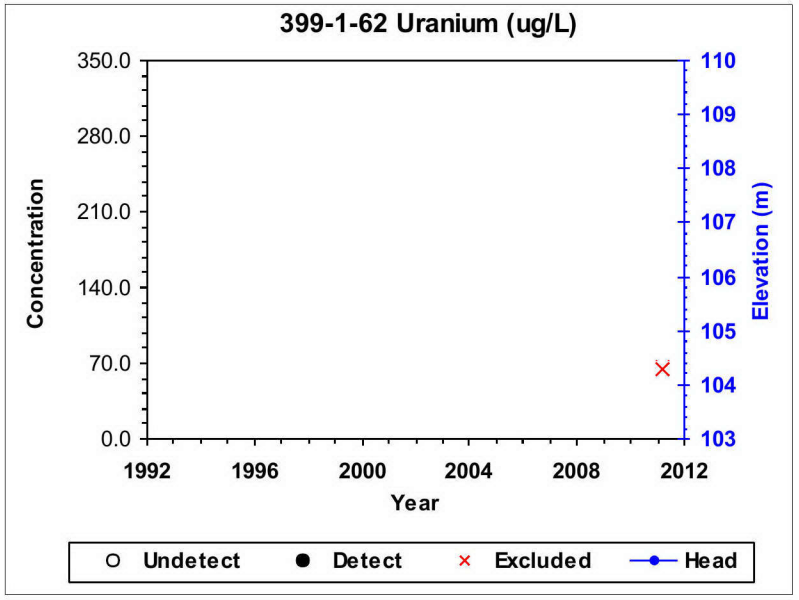

399-1-57 Uranium (ug/L)
Concentration
350.0
280.0
210.0
140.0
70.0
0.0
1992
1996
2000
2004
2008
2012
Year
110
109
108
107
106
105
104
103
Elevation (m)
Undetect
Detect
Excluded
Head

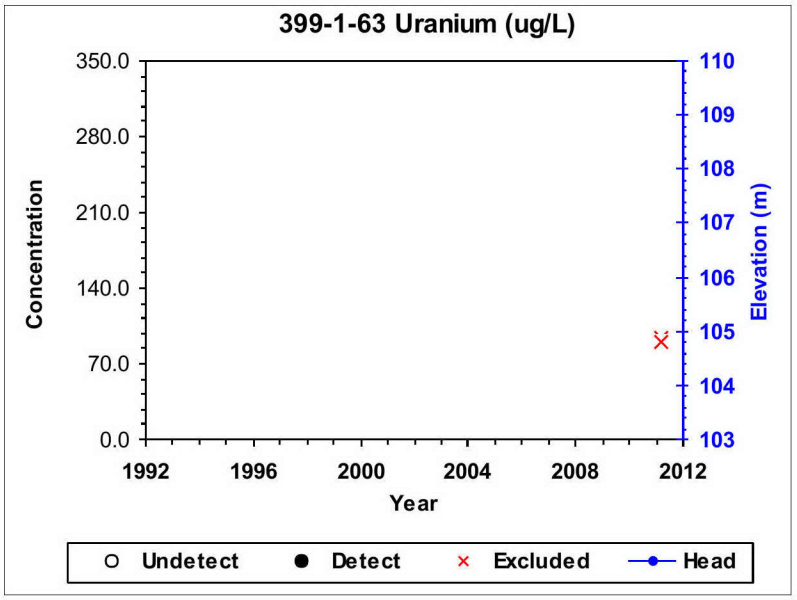

399-1-58 Uranium (ug/L)
Concentration
350.0
280.0
210.0
140.0
70.0
0.0
1992
1996
2000
2004
2008
2012
Year
110
109
108
107
106
105
104
103
Elevation (m)
Undetect
Detect
Excluded
Head

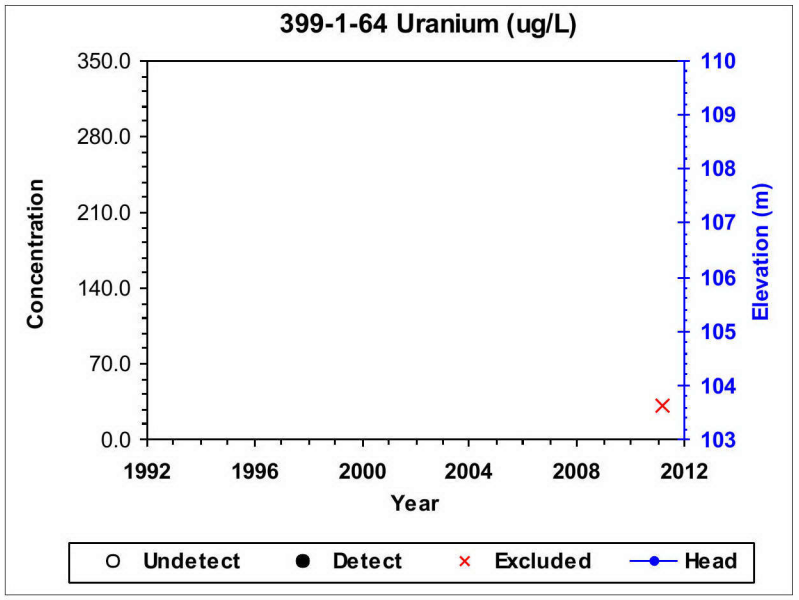

399-1-59 Uranium (ug/L)
Concentration
350.0
280.0
210.0
140.0
70.0
0.0
1992
1996
2000
2004
2008
2012
Year
110
109
108
107
106
105
104
103
Elevation (m)
Undetect
Detect
Excluded
Head

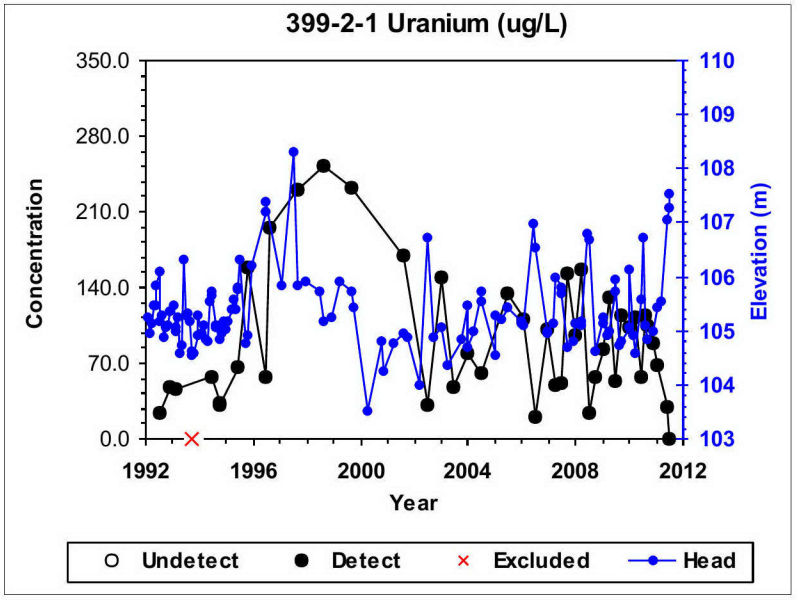

399-1-60 Uranium (ug/L)
Concentration
350.0
280.0
210.0
140.0
70.0
0.0
1992
1996
2000
2004
2008
2012
Year
110
109
108
107
106
105
104
103
Elevation (m)
Undetect
Detect
Excluded
Head

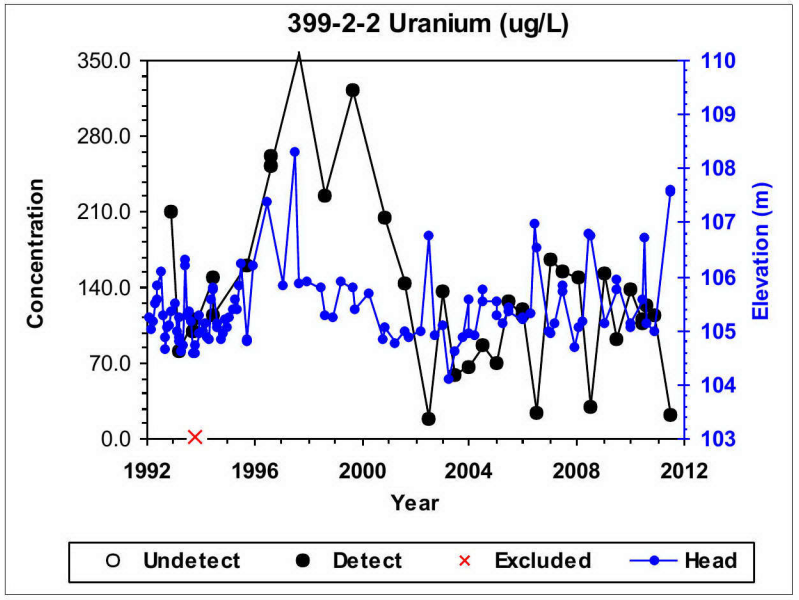

399-1-61 Uranium (ug/L)
Concentration
350.0
280.0
210.0
140.0
70.0
0.0
1992
1996
2000
2004
2008
2012
Year
110
109
108
107
106
105
104
103
Elevation (m)
Undetect
Detect
Excluded
Head


399-1-62 Uranium (ug/L)
Concentration
350.0
280.0
210.0
140.0
70.0
0.0
1992
1996
2000
2004
2008
2012
Year
110
109
108
107
106
105
104
103
Elevation (m)
Undetect
Detect
Excluded
Head


399-1-63 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head


399-1-64 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head


399-2-1 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head


399-2-2 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
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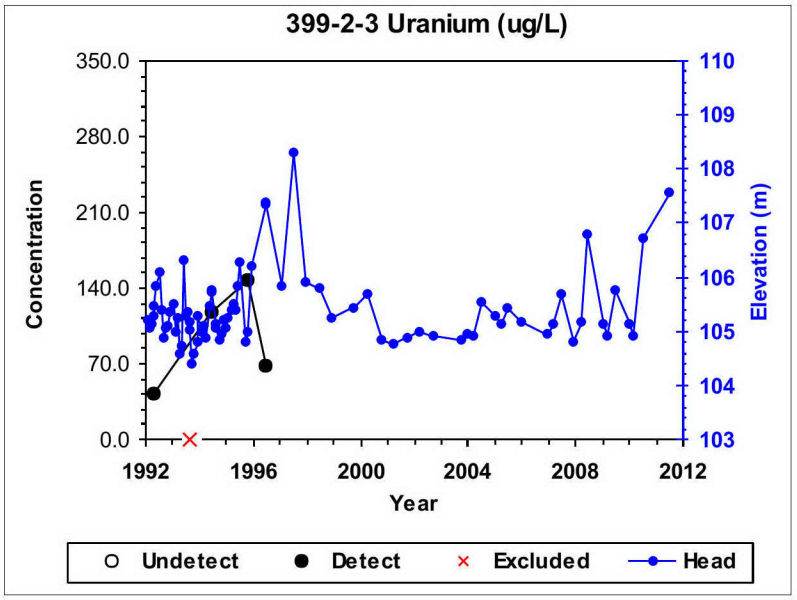
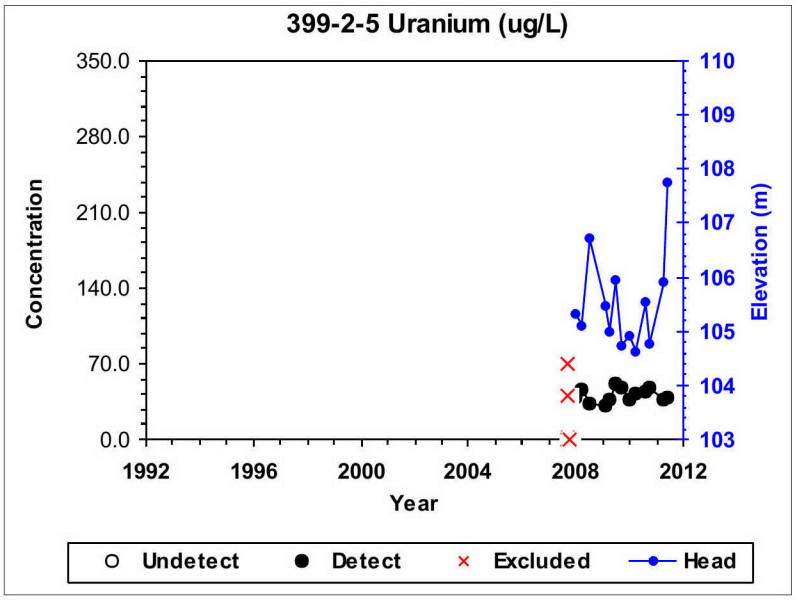
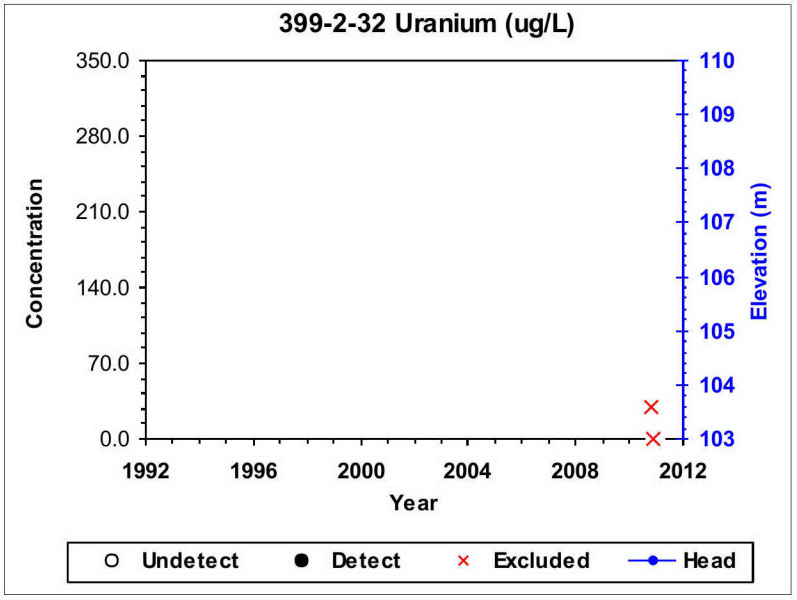
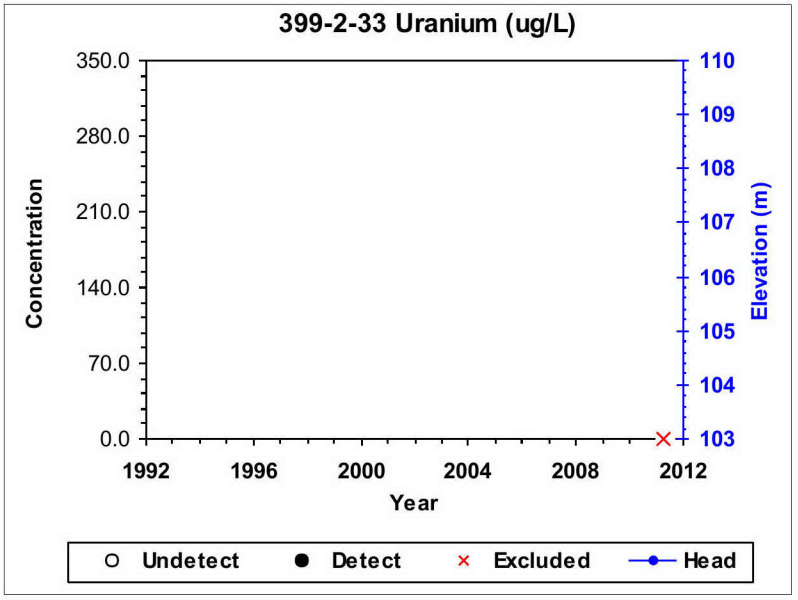
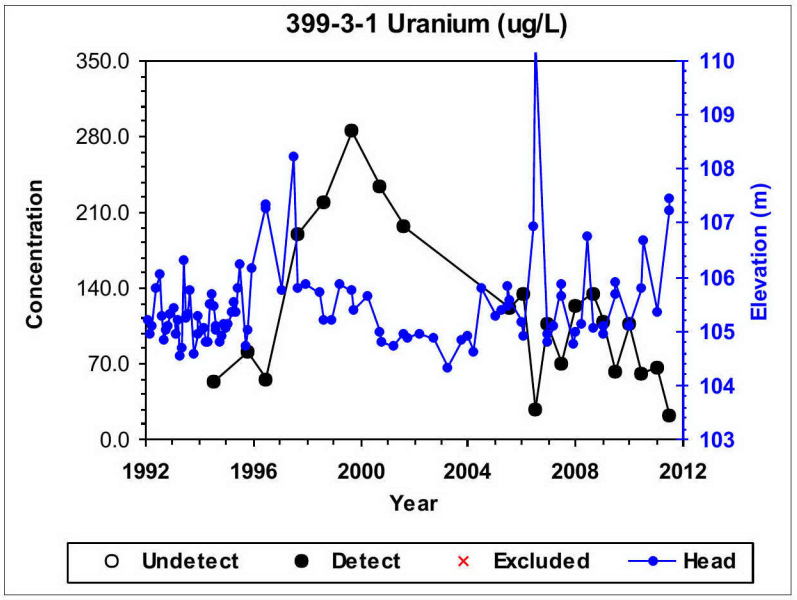
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

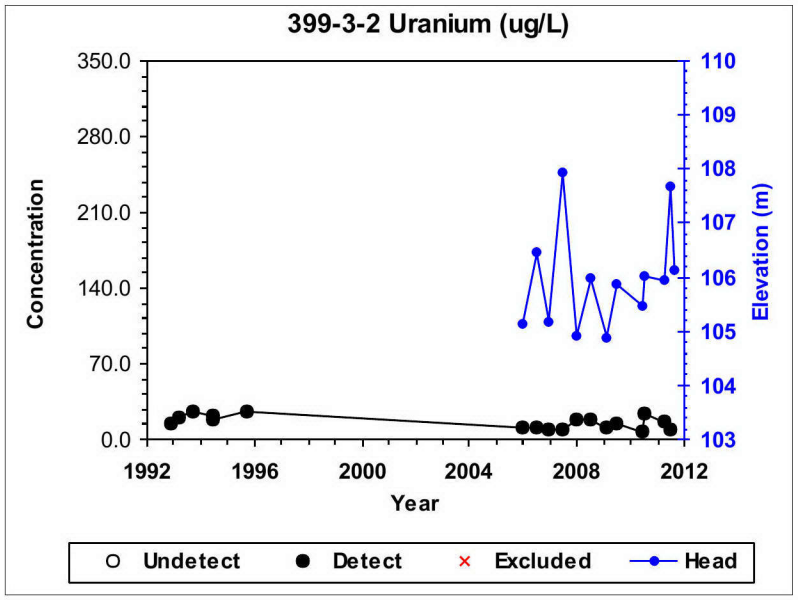

399-2-3 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

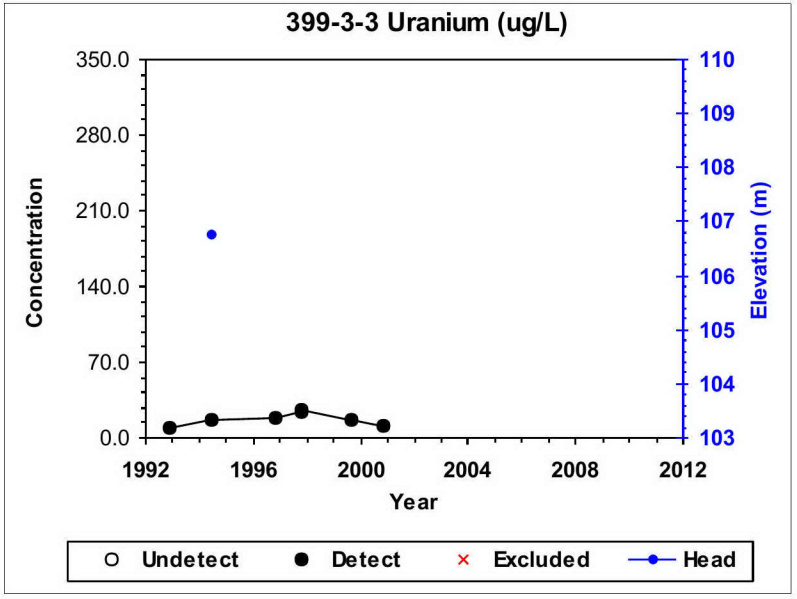

399-2-5 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

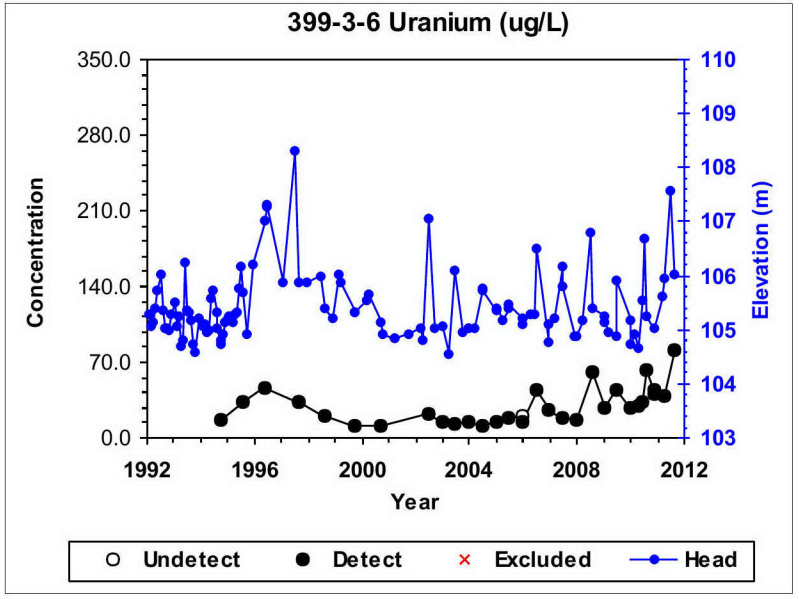

399-2-32 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

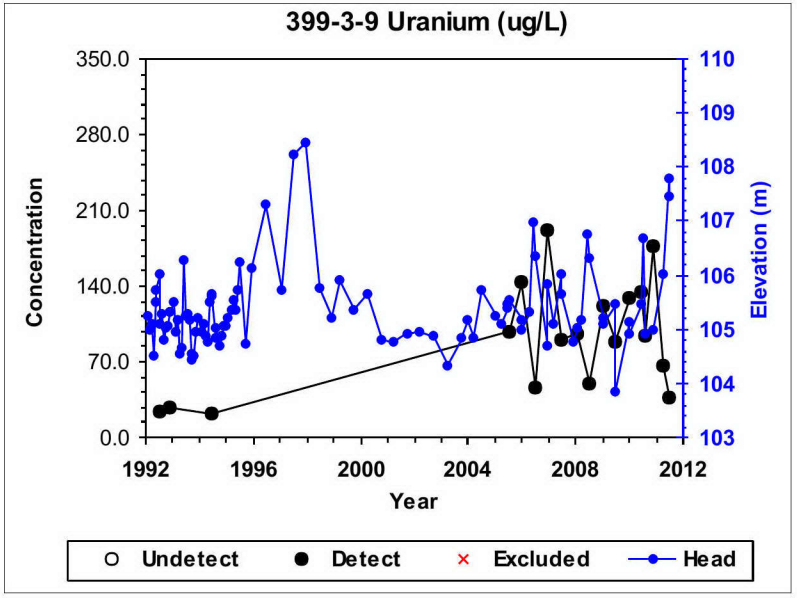

399-2-33 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

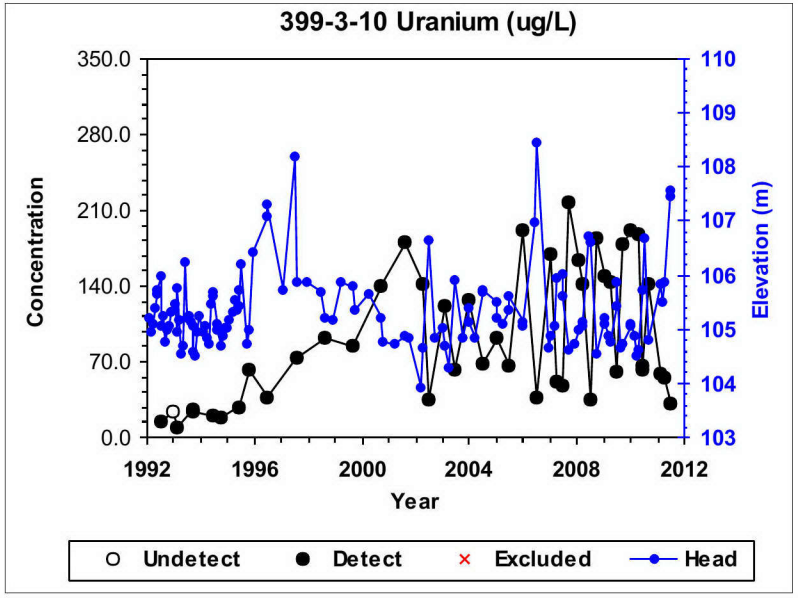

399-3-1 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

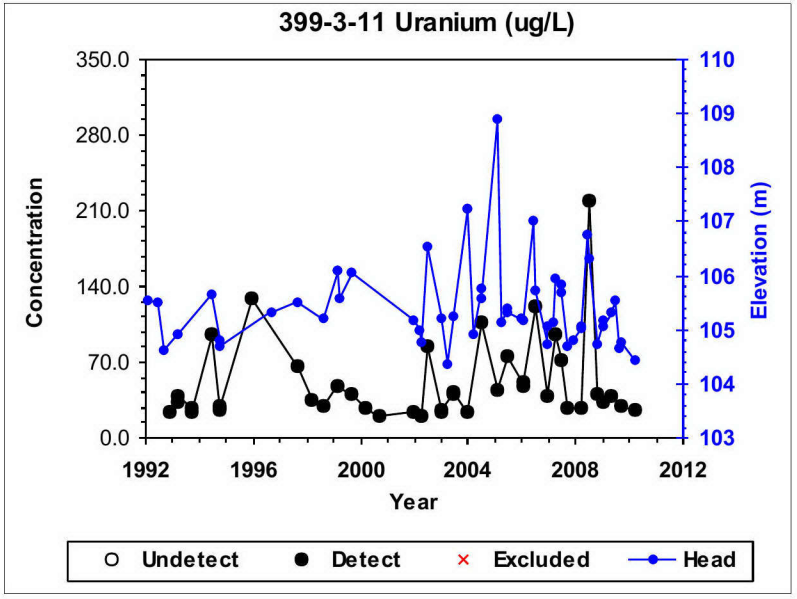

399-3-2 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

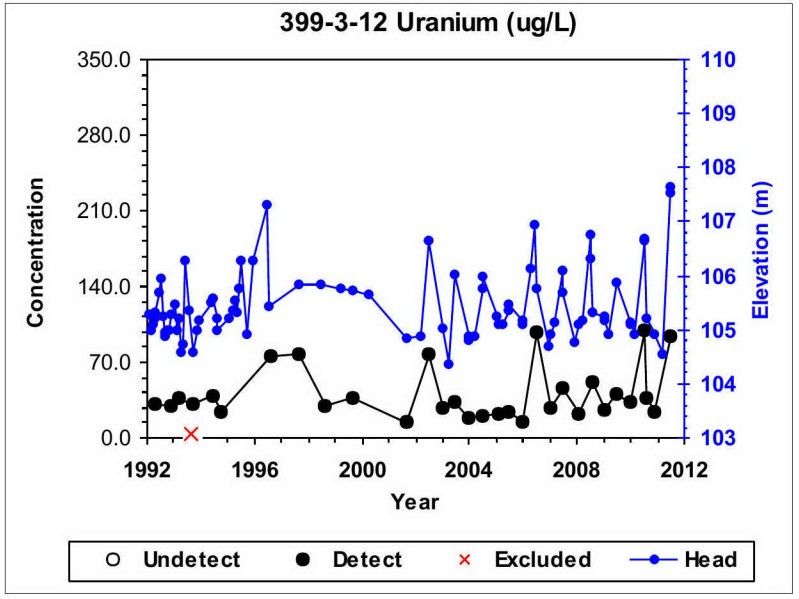

399-3-3 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

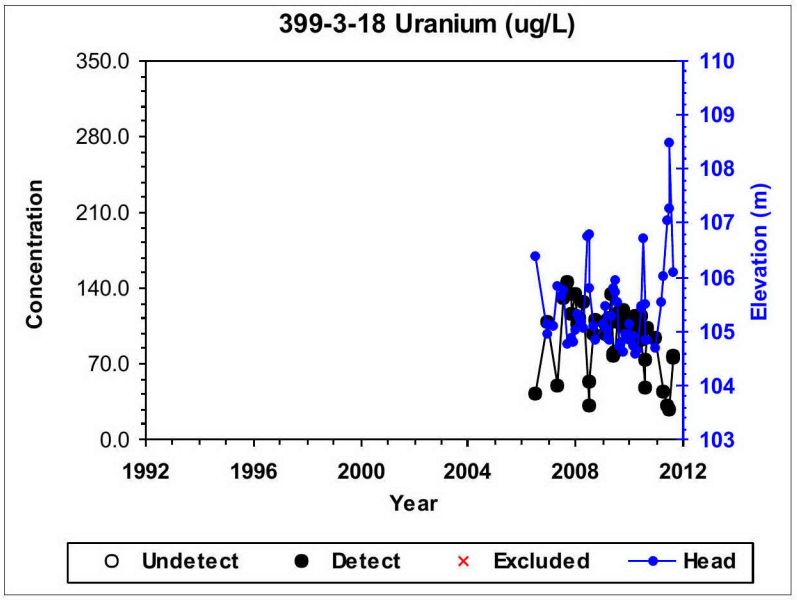

399-3-6 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

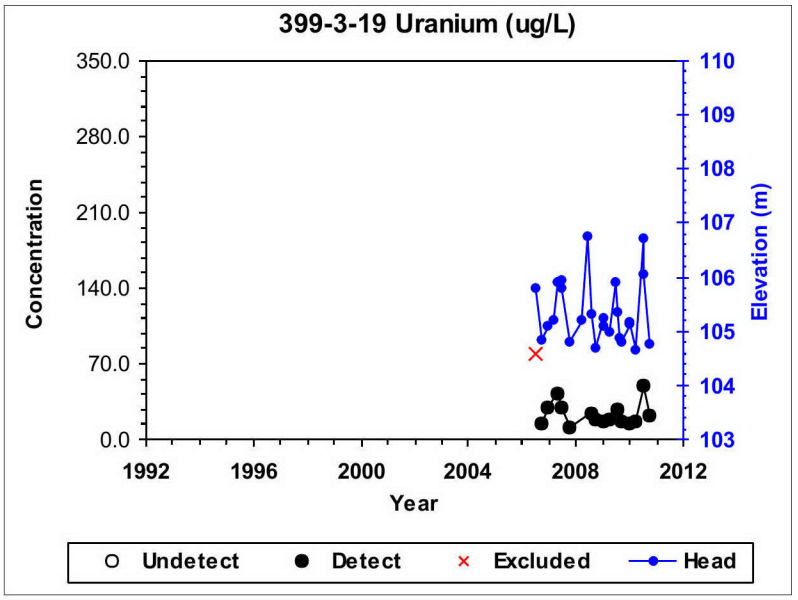

399-3-9 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

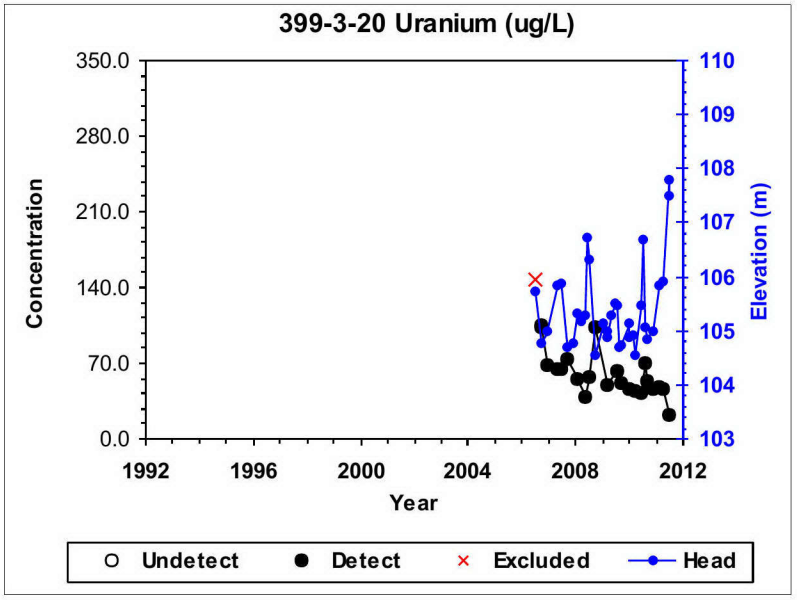

399-3-10 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

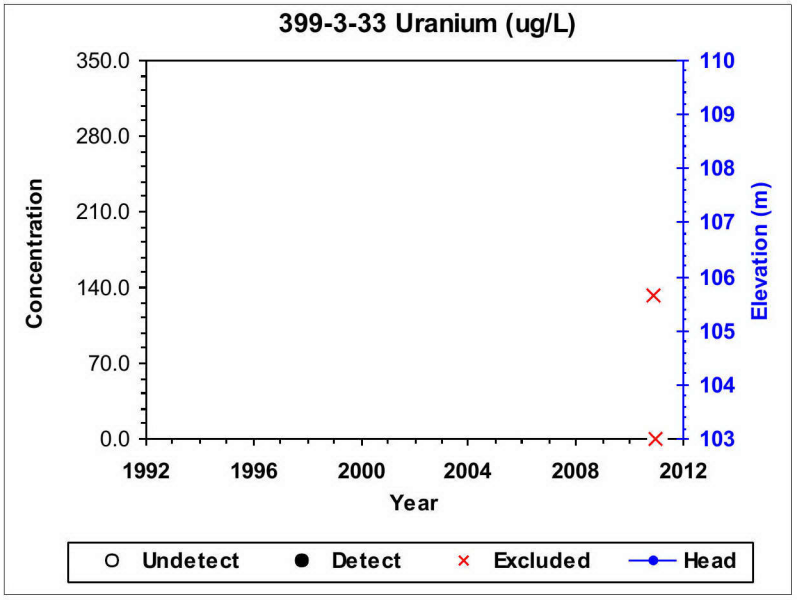

399-3-11 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

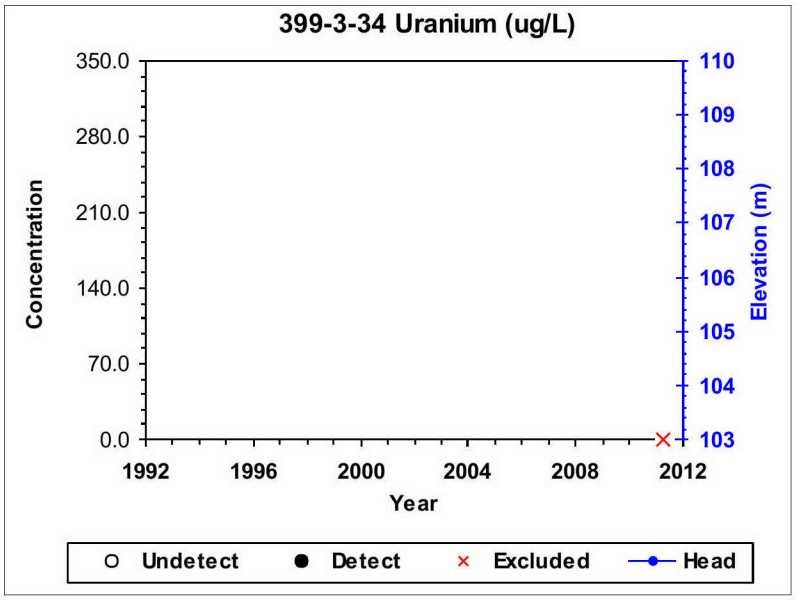

399-3-12 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

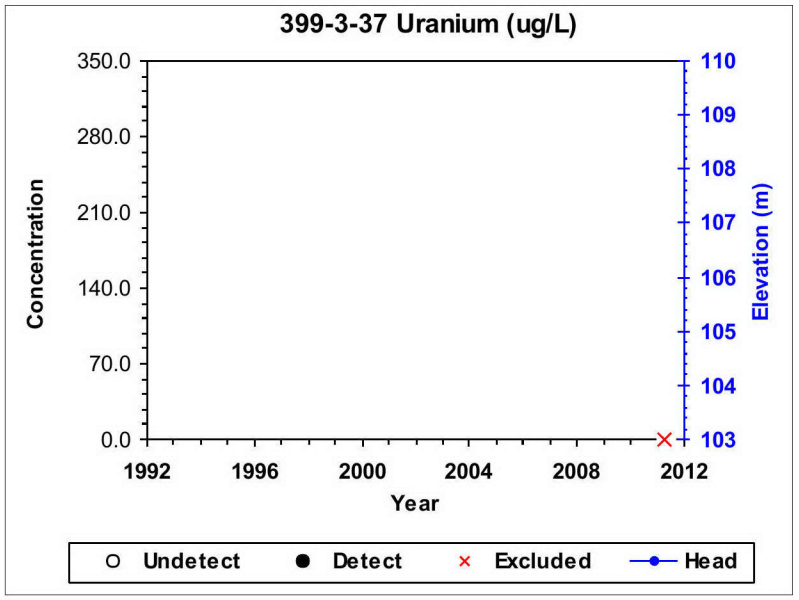

399-3-18 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

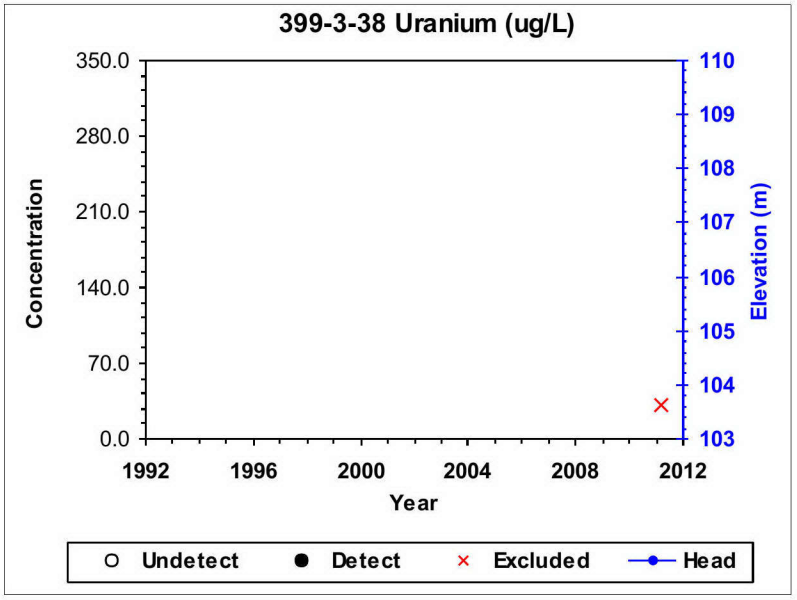

399-3-19 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

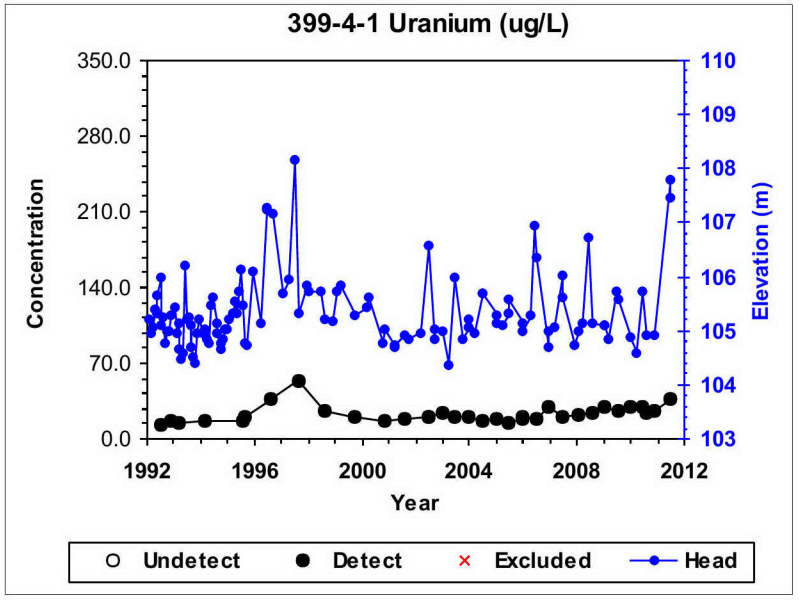

399-3-20 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

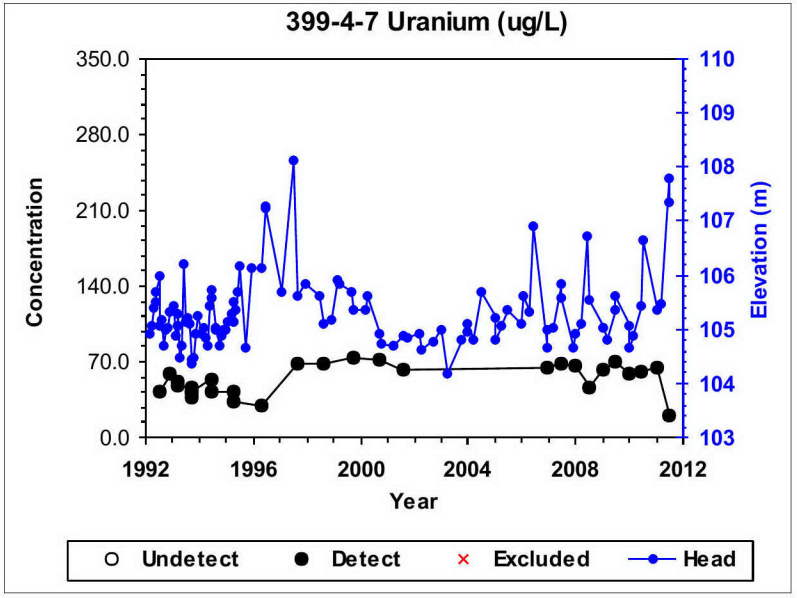

399-3-33 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

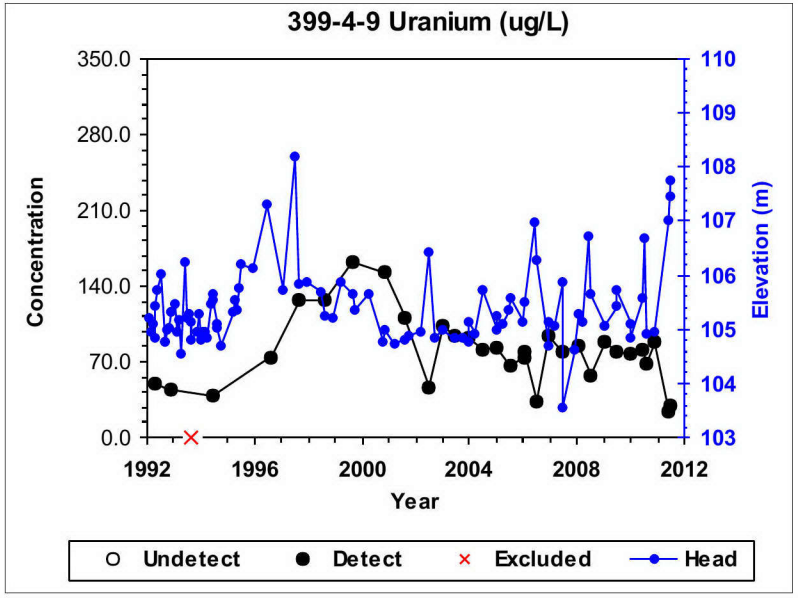

399-3-34 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

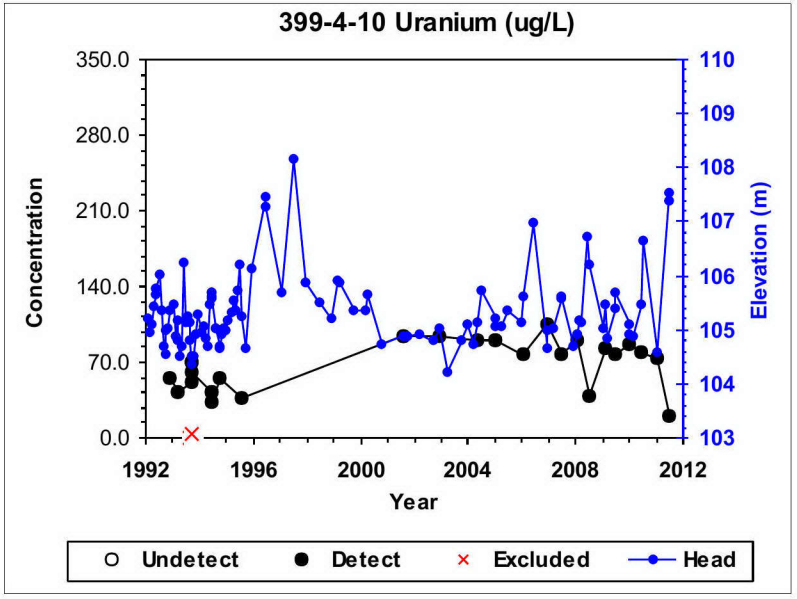

399-3-37 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

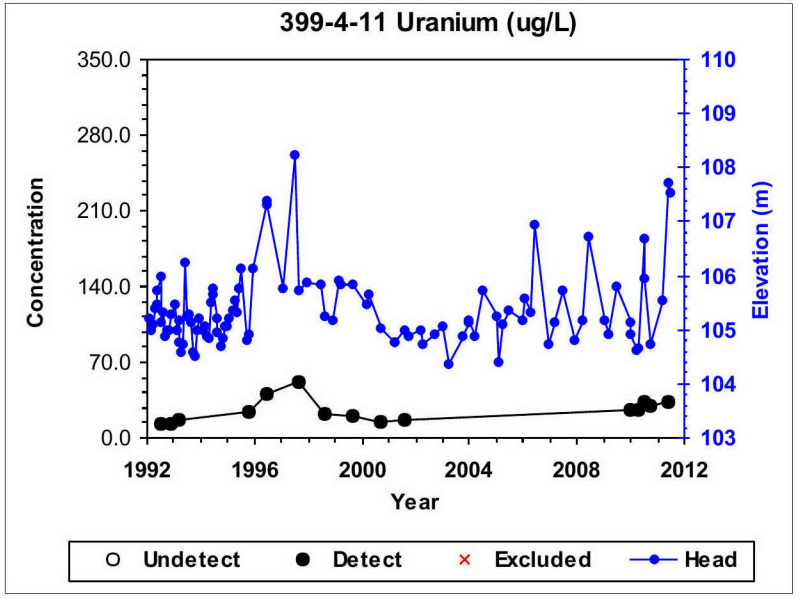

399-3-38 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

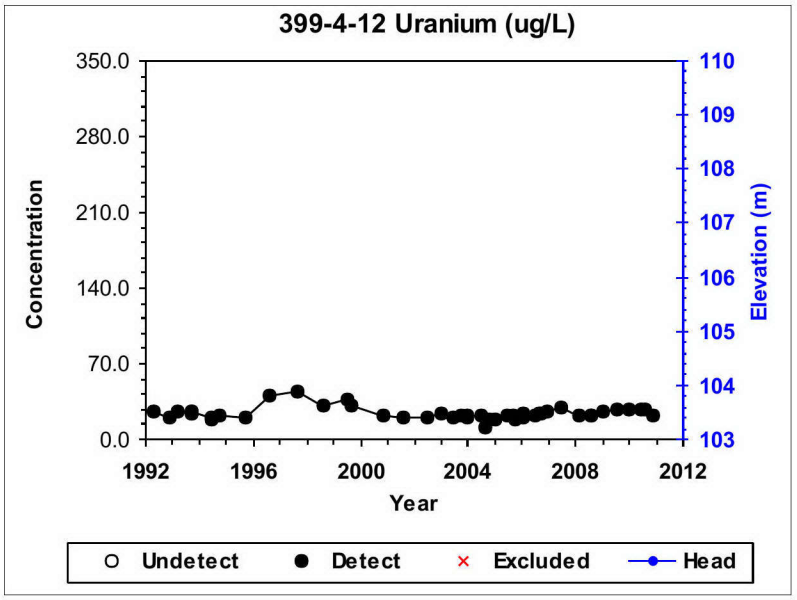

399-4-1 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

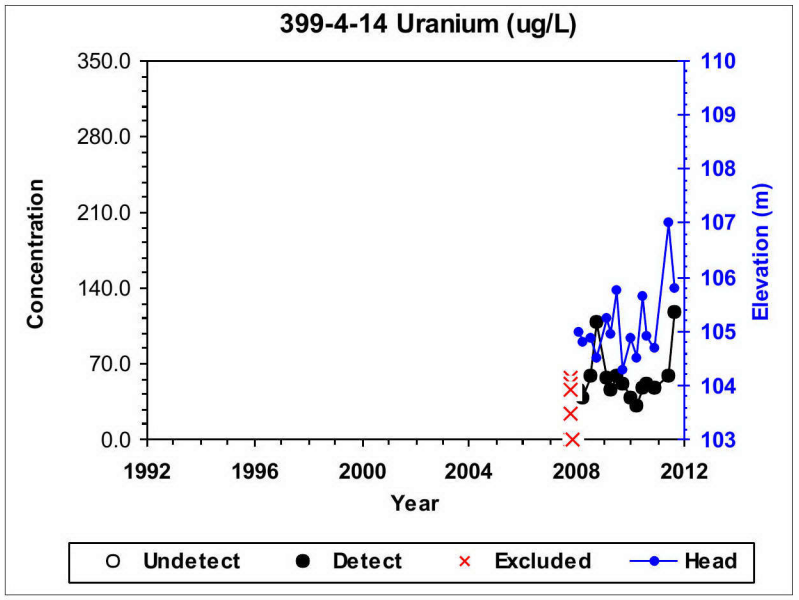

399-4-7 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

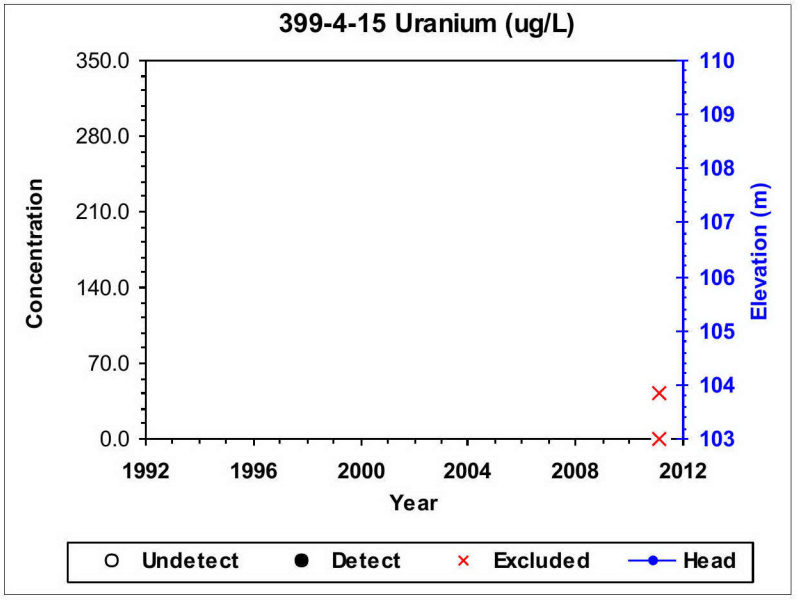

399-4-9 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

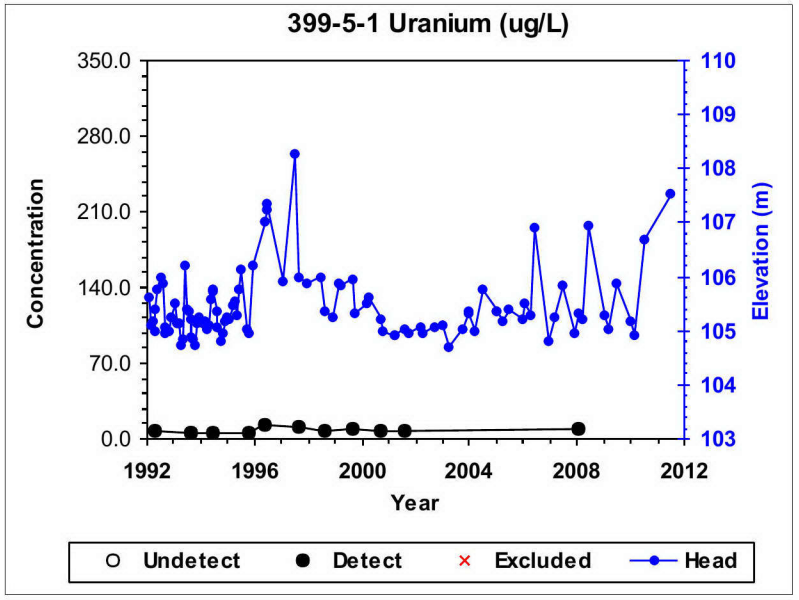

399-4-10 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

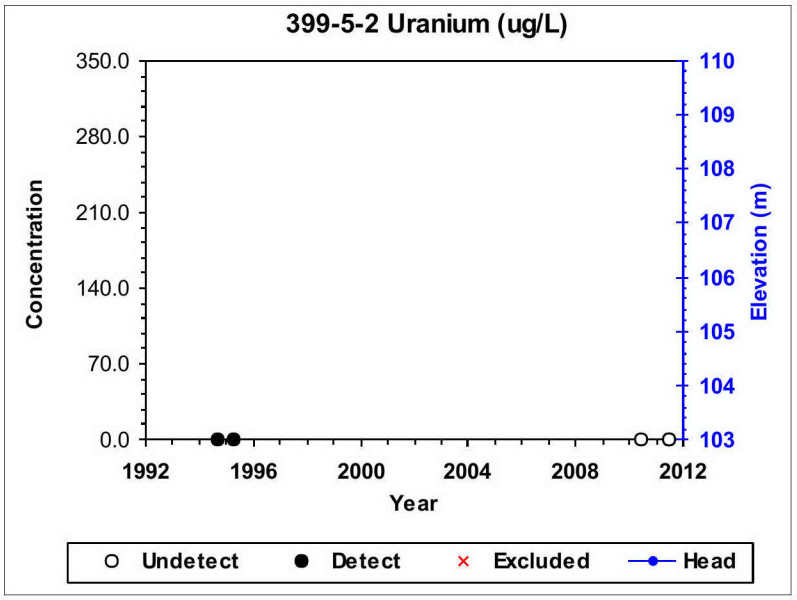

399-4-11 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head


399-4-12 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head


399-4-14 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head


399-4-15 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head


399-5-1 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head


399-5-2 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
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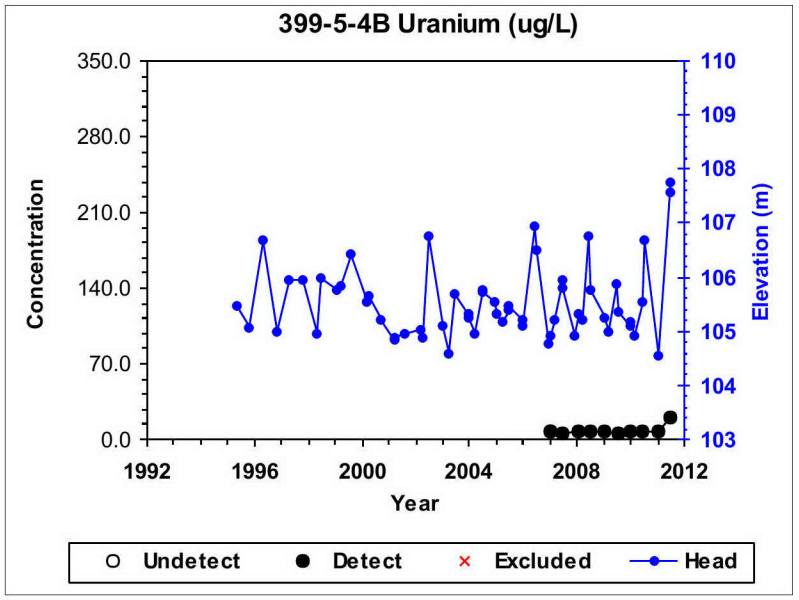
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head


399-5-4B Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
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109
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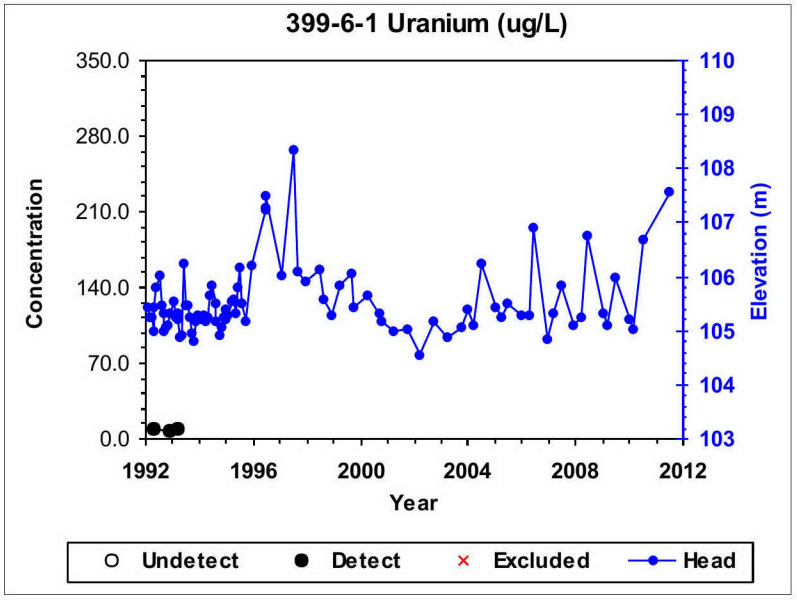
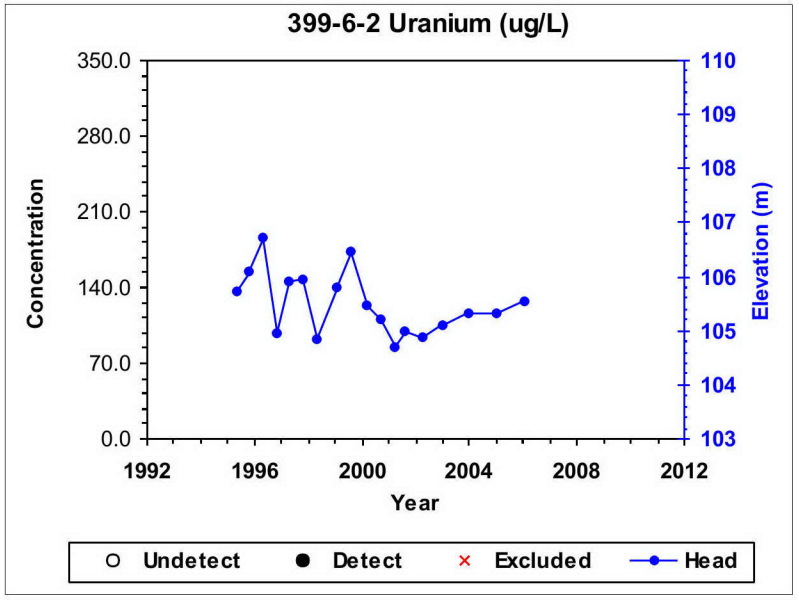
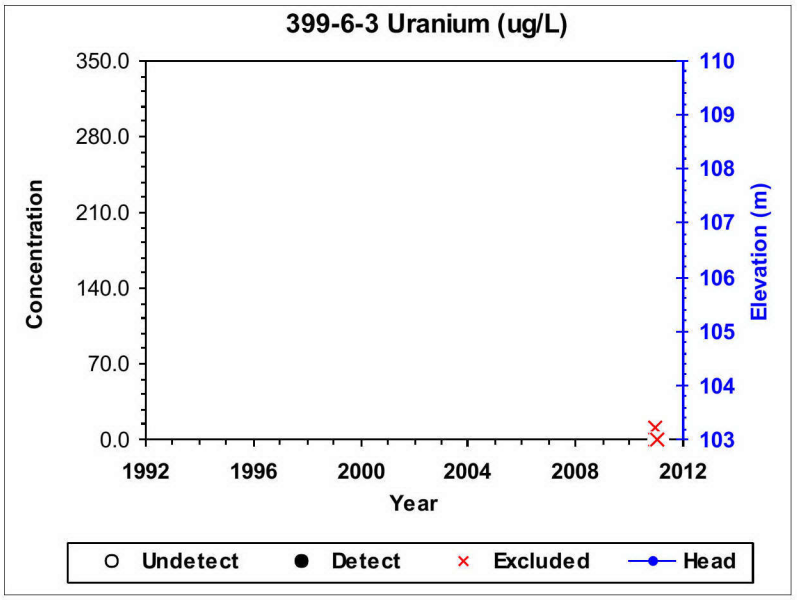
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head


399-6-1 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head


399-6-2 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head


399-6-3 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
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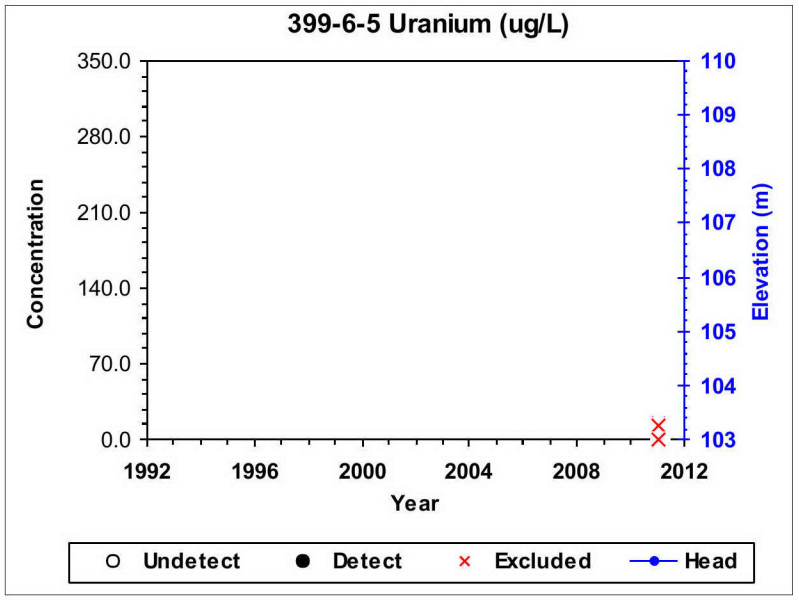
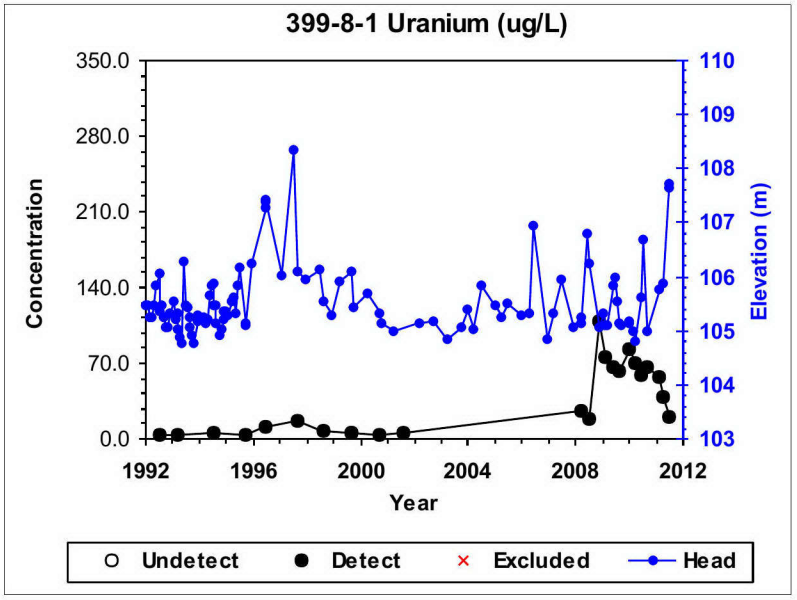
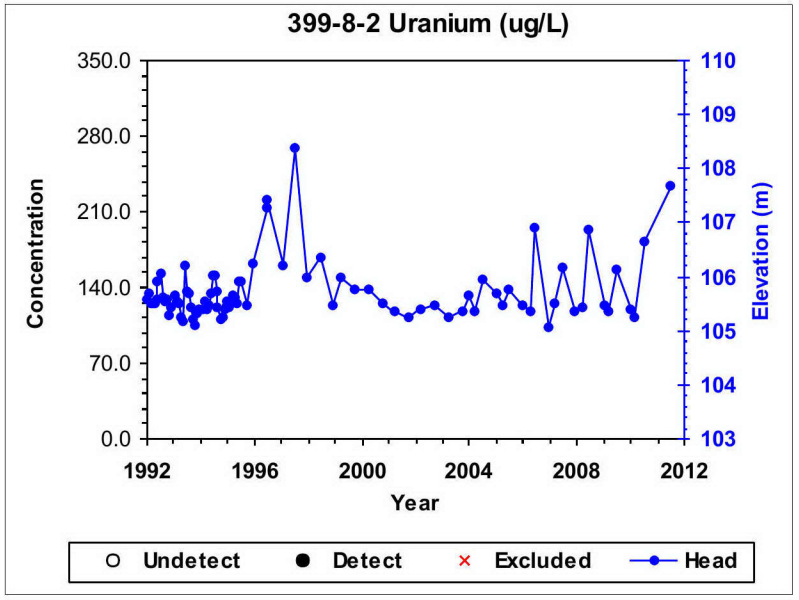
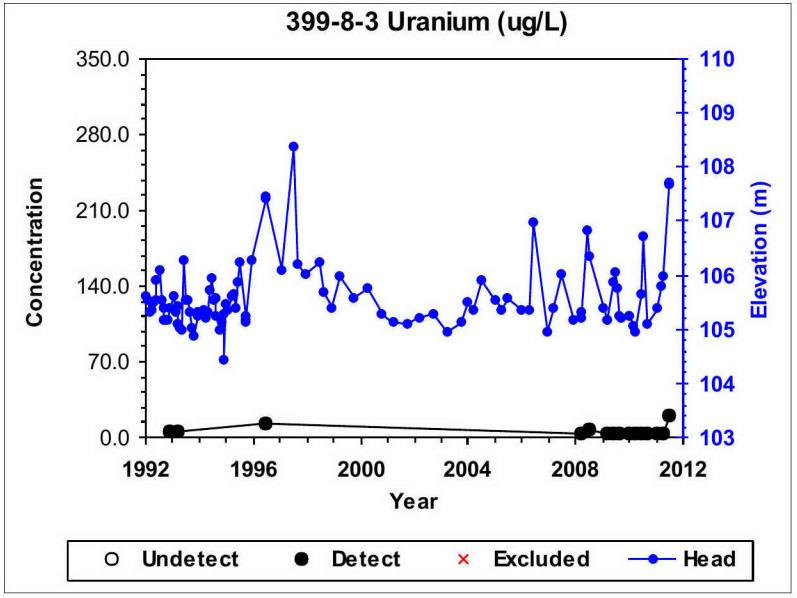
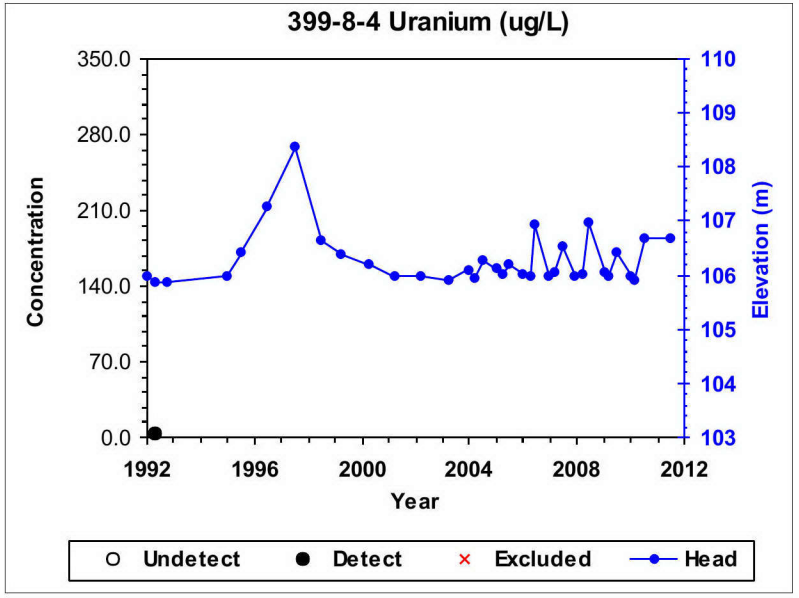
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

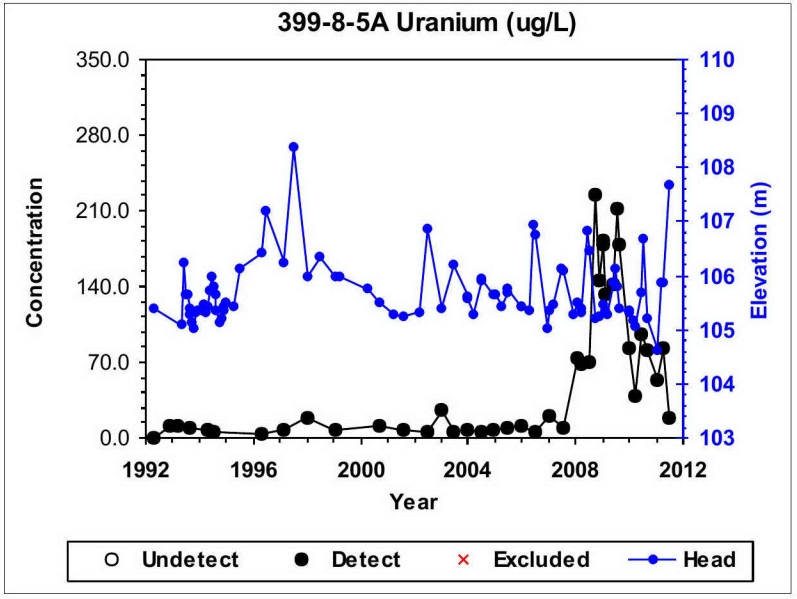

399-6-5 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

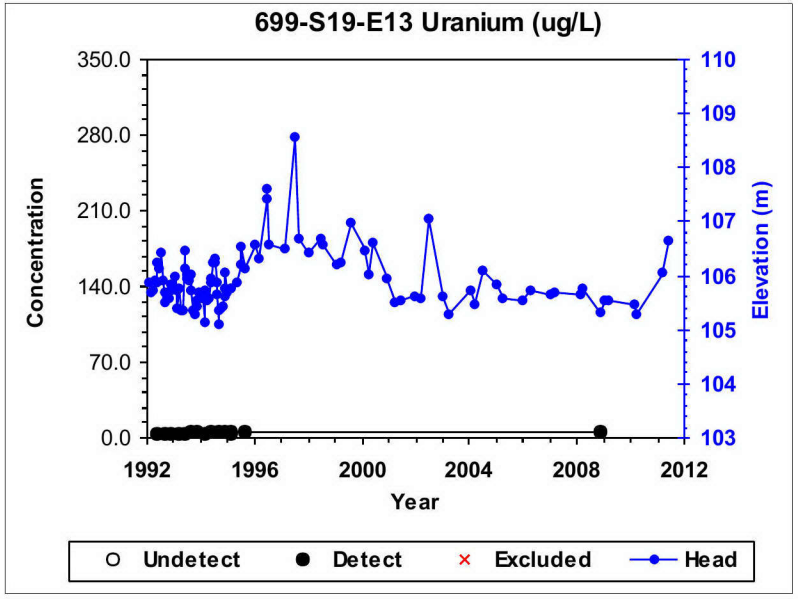

399-8-1 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

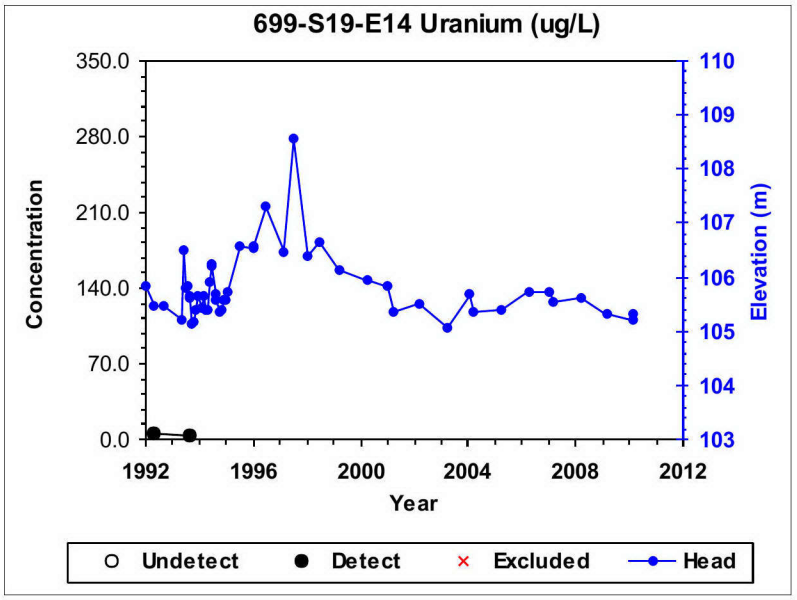

399-8-2 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

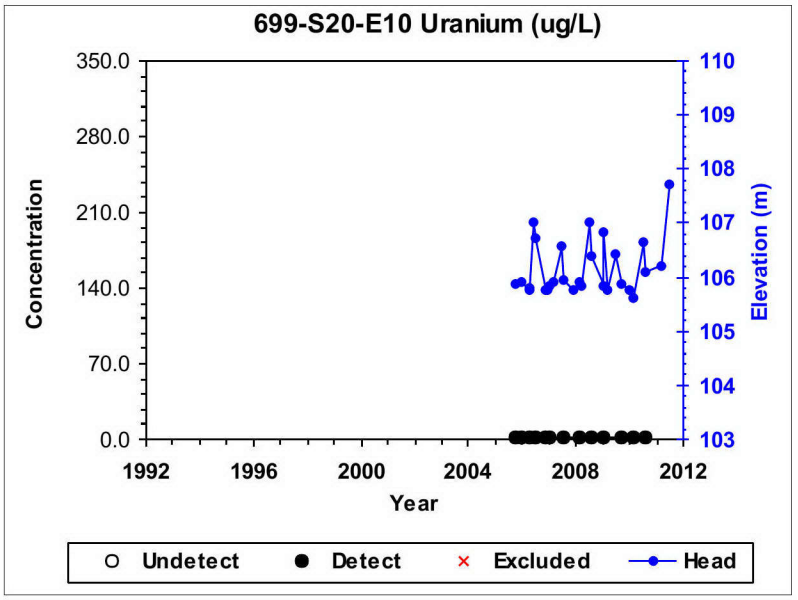

399-8-3 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

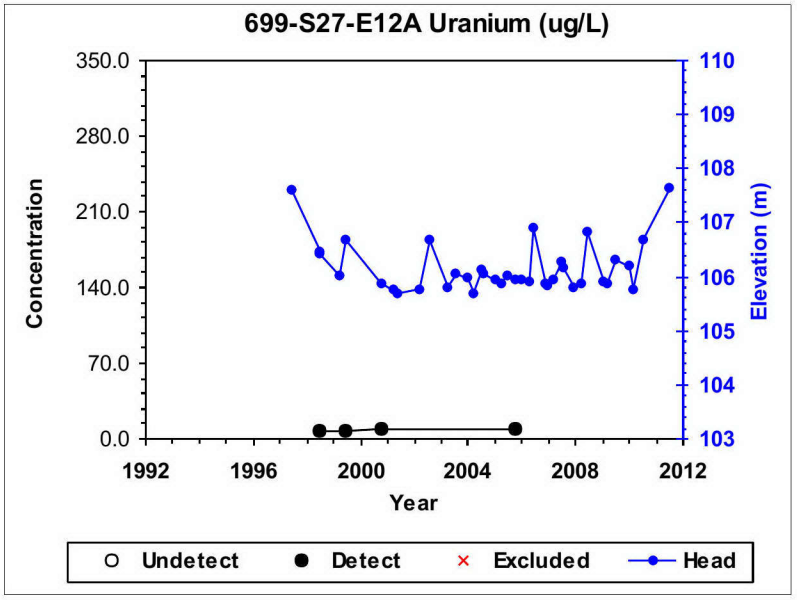

399-8-4 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

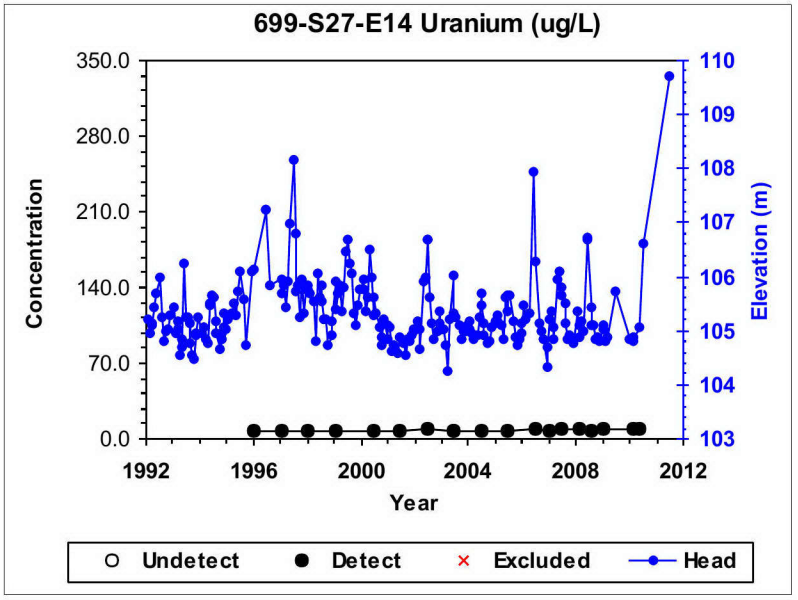

399-8-5A Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

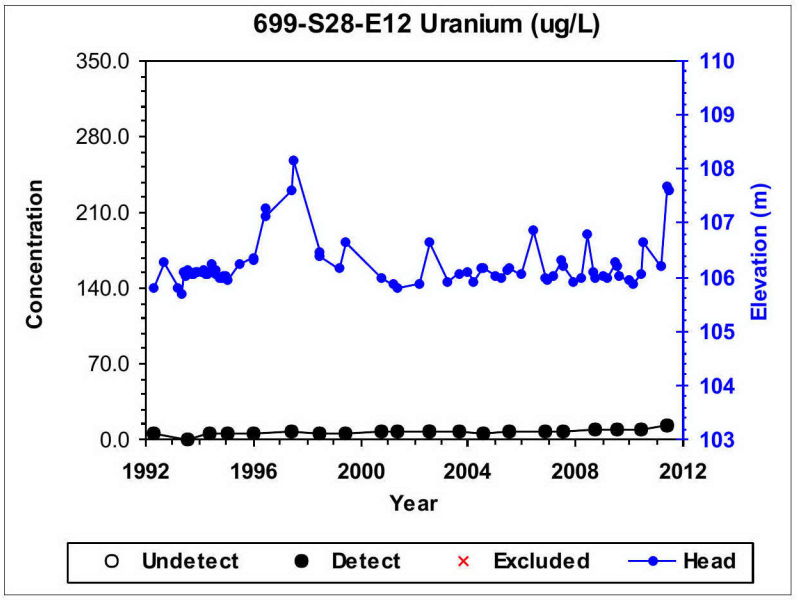

699-S19-E13 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

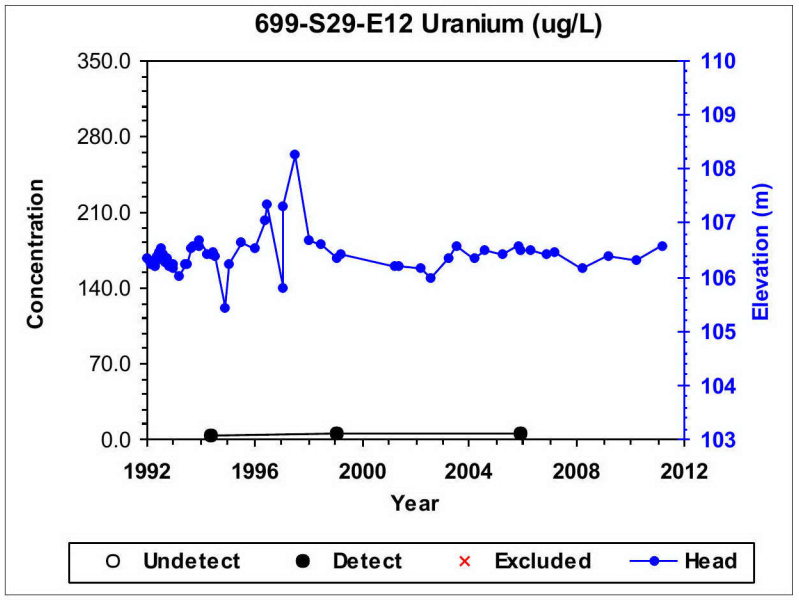

699-S19-E14 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

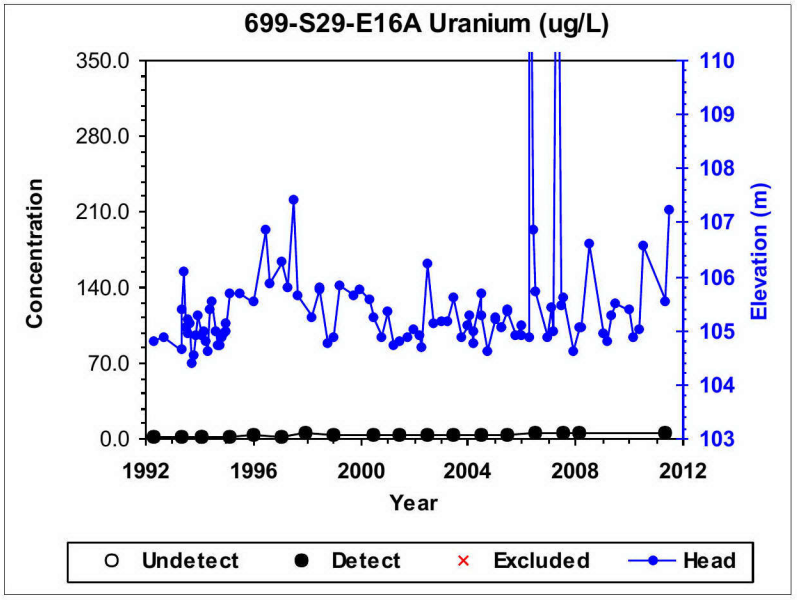

699-S20-E10 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head


699-S27-E12A Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head


699-S27-E14 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head


699-S28-E12 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head


699-S29-E12 Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head


699-S29-E16A Uranium (ug/L)
Concentration
Elevation (m)
Year
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280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

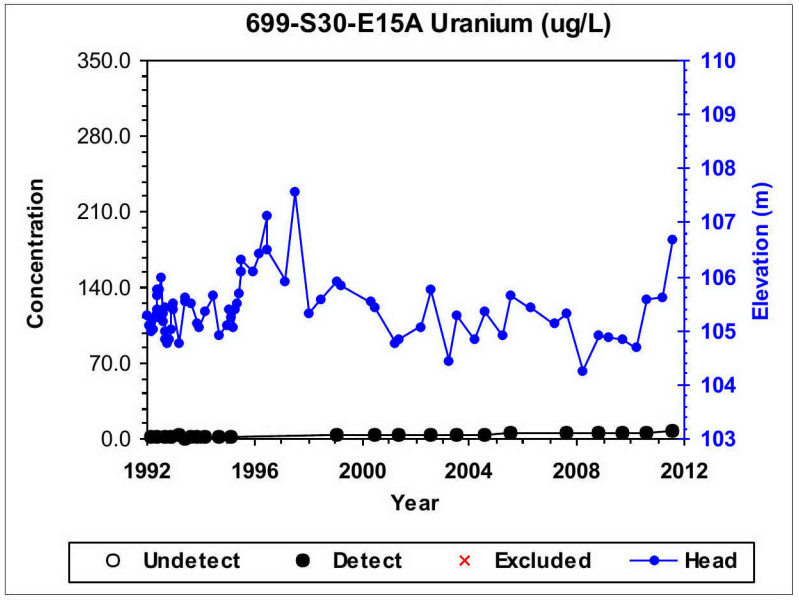
699-S30-E15A Uranium (ug/L)
Concentration
Elevation (m)
Year
350.0
280.0
210.0
140.0
70.0
0.0
110
109
108
107
106
105
104
103
1992
1996
2000
2004
2008
2012
Undetect
Detect
Excluded
Head

Table E-1. Analytes Detected Above Background in Soil Samples Used for Waste Site Reclassification in 300 Area

Waste site(s)	CVP/WSRF Number (See note e)	Waste Site-Specific Decision Unit(s) Sampled for Reclassification[b]		300 Area Target Analytes[c]																																								
		Shallow Zone[a]	Deep Zone[b]	Am-241	Cs-137	Co-60	H-3	Pu-238	Pu-239/240	Pu-241	Sr-90	U-233/234	U-235	U-238	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium (total)	Copper	Lead	Nickel	Selenium	Silver	Strontium	Tin	Thallium	Uranium	Zinc	Mercury	Aroclor-1016	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	Chloroform	Hexachloroethane	Hexachlorobutadiene	Methyl isobutyl ketone (hexone)	Methyl ethyl ketone	Toluene	Tetrachloroethene	Trichloroethene	Butylbenzylphthalate
Waste Sites Reclassified as Interim Closed or Closed Out																																												
4843	RCRA closure	--[d]	--[d]																																										
300 ASH PITS	WSRF 98-004	Yes	No													S												S						S											
300 RFBP 300-262 316-1 UPR-300-32 UPR-300-33 UPR-300-34 UPR-300-35 UPR-300-36 UPR-300-37 UPR-300-FF-1	CVP-2003-00002	Yes	No			S						S	S	S																				S	S										
300 SE	WSRF 98-080	--[d]	--[d]																																										
300-10	99-105	Yes	No									S	S	S		S																													
300-19	WSRF 98-063	--[d]	--[d]																																										
300-223	WSRF 2001-042	Yes	No																																										
300-23	NA	Yes	No																																										
300-231	WSRF 99-038	--[d]	--[d]																																										
300-272	WSRF 2002-049	Yes	No																																										
300-35	WSRF 99-003	--[d]	--[d]																																										
300-37	WSRF 98-231	Yes	No																															S	S										
300-44	WSRF 99-109	Yes	No													S																													
300-45	WSRF 99-110	Yes	No									S		S																														
300-49	CVP-2000-00020	Yes	No									S																						S										
300-50	CVP-2000-00021	Yes	No									S	S	S		S																		S	S										
300-53	WSRF 99-014	--[d]	--[d]																																										
300-57	WSRF 98-174	--[d]	--[d]																																										
303-K CWS	WSRF 2003-031	--[d]	--[d]																																										
304 CF	WSRF 99-094	--[d]	--[d]																																										
304 SA	WSRF 2001-001	--[d]	--[d]																																										
305-B SF	WSRF 2008-051	--[d]	--[d]																																										
311 MT1	WSRF 99-006	--[d]	--[d]																																										
311 MT2	WSRF 99-007	--[d]	--[d]																																										
311-TK-40	WSRF 2001-100	--[d]	--[d]																																										
311-TK-50	WSRF 2001-101	--[d]	--[d]																																										
313 CENTRIFUGE	WSRF 2001-102	--[d]	--[d]																																										
313 FP	WSRF 2001-103	--[d]	--[d]																																										
313 MT	WSRF 99-008	--[d]	--[d]																																										

Table E-1. Analytes Detected Above Background in Soil Samples Used for Waste Site Reclassification in 300 Area

Waste site(s)	CVP/WSRF Number (See note e)	Waste Site-Specific Decision Unit(s) Sampled for Reclassification[b]		300 Area Target Analytes[c]																																									
		Shallow Zone[a]	Deep Zone[b]	Am-241	Cs-137	Co-60	H-3	Pu-238	Pu-239/240	Pu-241	Sr-90	U-233/234	U-235	U-238	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium (total)	Copper	Lead	Nickel	Selenium	Silver	Strontium	Tin	Thallium	Uranium	Zinc	Mercury	Aroclor-1016	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	Chloroform	Hexachloroethane	Hexachlorobutadiene	Methyl isobutyl ketone (hexone)	Methyl ethyl ketone	Toluene	Tetrachloroethene	Trichloroethene	Butylbenzylphthalate
313 URO	WSRF 99-016	--[d]	--[d]																																										
313-TK-2	WSRF 2001-104	--[d]	--[d]																																										
316-2 618-12 UPR-300-7	WSRF 99-050	Yes	No			S						S	S	S																				S	S	S									
316-5 UPR-300-8 UPR-300-9 UPR-300-15 UPR-300-19 UPR-300-20 UPR-300-21 UPR-300-22 UPR-300-23 UPR-300-24 UPR-300-25 UPR-300-26 UPR-300-27 UPR-300-28 UPR-300-29 UPR-300-30 UPR-300-47	WSRF 99-108	Yes	No			S						S	S	S		S																		S	S	S									
332 SF	WSRF 98-062	--[d]	--[d]																																										
333-TK-11	WSRF 2001-105	--[d]	--[d]																																										
333-TK-7	WSRF 2001-109	--[d]	--[d]																																										
334 TFWAST	WSRF 2001-106	--[d]	--[d]																																										
334-A-TK-B	WSRF 2001-107	--[d]	--[d]																																										
334-A-TK-C	WSRF 2001-108	--[d]	--[d]																																										
3718-F BS	WSRF 98-085	--[d]	--[d]																																										
3718-F SF	WSRF 98-086	--[d]	--[d]																																										
3718-F TT1	WSRF 98-087	--[d]	--[d]																																										
3718-F TT2	WSRF 98-088	--[d]	--[d]																																										
400-31	NA	--[d]	--[d]																																										
400-5	NA	--[d]	--[d]																																										
427 HWSA	NA	--[d]	--[d]																																										
4831 LHWSA	NA	--[d]	--[d]																																										
600-278	WSRF 2003-054	--[d]	--[d]																																										
600-46	WSRF 98-097	--[d]	--[d]																																										
618-4	CVP-2003-00020	Yes	Yes									S,D	S,D	S,D								S																			S				
618-9	WSRF 98-075	Yes	No									S		S																							S	S	S	S		S	S	S	S

Table E-1. Analytes Detected Above Background in Soil Samples Used for Waste Site Reclassification in 300 Area

Waste site(s)	CVP/WSRF Number (See note e)	Waste Site-Specific Decision Unit(s) Sampled for Reclassification[b]		300 Area Target Analytes[c]																																														
		Shallow Zone[a]	Deep Zone[b]	Am-241	Cs-137	Co-60	H-3	Pu-238	Pu-239/240	Pu-241	Sr-90	U-233/234	U-235	U-238	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium (total)	Copper	Lead	Nickel	Selenium	Silver	Strontium	Tin	Thallium	Uranium	Zinc	Mercury	Aroclor-1016	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	Chloroform	Hexachloroethane	Hexachlorobutadiene	Methyl isobutyl ketone (hexone)	Methyl ethyl ketone	Toluene	Tetrachloroethene	Trichloroethene	Butylbenzylphthalate
628-4	CVP-2003-00001	Yes	No																			S						S					S	S	S											
BTTF	WSRF 98-073	--[d]	--[d]																																												
PCTTF	WSRF 98-074	--[d]	--[d]																																												
TTTF	WSRF 98-072	--[d]	--[d]																																												
UPR-300-41	WSRF 99-011	--[d]	--[d]																																												
UPR-600-11	WSRF 98-215	--[d]	--[d]																																												
300 VTS	CVP-2005-00009	Yes	No		S																																										
300-109 UPR-300-46	CVP-2010-00004	Yes	No		S							S	S	S													S								S	S										
300-110 303-M SA 303-M UOF 333 LHWSA 333 ESHWSA 618-1 618-1:1 618-1:2 UPR-300-13 UPR-300-14	CVP-2010-00001	Yes	Yes			D						S,D	S,D	S,D			D		D	S,D	S,D	D			S,D				S,D	S,D	D			S	S,D	S,D										
300-18	CVP-2005-00004	Yes	No																																											
300-259	WSRF 2009-059	Yes	No									S		S																S																	
300-275	WSRF 2008-059	Yes	No		S							S	S	S							S					S	S																			
300-33 300-41 300-256	WSRF 2010-058	Yes	No									S	S	S											S				S			S	S	S	S	S									S
300-8	CVP-2005-00007	Yes	No																																											
600-243	WSRF 2007-033	Yes	No														S	S	S		S	S	S	S						S					S	S									
600-259:1 600-259:2	CVP-2005-00008	Yes	No		S																																								
600-290:1 618-13	CVP-2009-00005	Yes	No																																											
600-47	CVP-2005-00005	Yes	No									S		S																																
618-2	CVP-2006-00010	Yes	Yes	S,D	S,D		S	D	S,D	D	D	S,D	S,D	S,D										S,D			S,D		S,D						S										
618-3	CVP-2006-00005	Yes	No									S	S	S																																
618-5	CVP-2003-00021	Yes	Yes									S,D	S,D	S,D								D																							
618-7	CVP-2008-00002	Yes	No		S							S	S	S					S	S	S		S				S	S						S	S									
618-8	CVP-2006-00006	Yes	No																					S																					
JA JONES 1	CVP-2001-00019	Yes	No																			S																							
UPR-300-17	WSRF 2010-014	Yes	No									S	S	S								S	S							S				S	S	S									

Table E-1. Analytes Detected Above Background in Soil Samples Used for Waste Site Reclassification in 300 Area

		Waste Site-Specific Decision Unit(s) Sampled for Reclassification[b]		300 Area Target Analytes[c]																																									
Waste site(s)	CVP/WSRF Number (See note e)	Shallow Zone[a]	Deep Zone[b]	Am-241	Cs-137	Co-60	H-3	Pu-238	Pu-239/240	Pu-241	Sr-90	U-233/234	U-235	U-238	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium (total)	Copper	Lead	Nickel	Selenium	Silver	Strontium	Tin	Thallium	Uranium	Zinc	Mercury	Aroclor-1016	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	Chloroform	Hexachloroethane	Hexachlorobutadiene	Methyl isobutyl ketone (hexone)	Methyl ethyl ketone	Toluene	Tetrachloroethene	Trichloroethene	Butylbenzylphthalate
Waste Sites Reclassified as No Action																																													
300 FBP:1	WSRF 98-005	--[d]	--[d]																																										
300 FBP:2	WSRF 2000-116	--[d]	--[d]																																										
300-1	WSRF 98-081	--[d]	--[d]																																										
300-253	WSRF 99-042	--[d]	--[d]																																										
300-260	WSRF 2010-074	Yes	No										S	S							S	S								S															
300-29	NA	--[d]	--[d]																																										
300-3	NA	--[d]	--[d]																																										
300-51	NA	--[d]	--[d]																																										
300-52	NA	--[d]	--[d]																																										
331 LSLDF	WSRF 2008-020	Yes	No												S		S		S	S	S	S		S	S					S	S				S										S
400-36	WSRF 2004-102	--[d]	--[d]																																										
600-22	WSRF 98-219	--[d]	--[d]																																										
UPR-600-15	WSRF 2004-097	--[d]	--[d]																																										

Table E-1. Analytes Detected Above Background in Soil Samples Used

Waste site(s)	CVP/WSRF Number (See note e)	Waste Site-Specific Decision Unit(s) Sampled for Reclassification[b]		Other Analytes[c]																																									
		Shallow Zone[a]	Deep Zone[b]	Bis(2-ethylhexyl) phthalate	Benzo(a)pyrene	Chrysene	Phenanthrene	TPH	Boron	Molybdenum	Titanium	Chloride	Fluroide	Nitrate	Sulfate	1,1,2,2-tetrachloroethene	Acetone	Methylene chloride	Di-n-butyl phthalate	Isophorone	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Dibenzofuran	Dibenz(a,h)anthracene	Fluorene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Naphthalene	Pyrene	Aldrin	alpha-BHC	gamma-BHC	delta-BHC	4,4'-DDE	Endrin (aldehyde, ketone)	Ensodulfan (I, II, sulfate)	Heptachlor epoxide	Methoxychlor
Waste Sites Reclassified as Interim Closed or Closed Out																																													
4843	RCRA closure	--[d]	--[d]																																										
300 ASH PITS	WSRF 98-004	Yes	No																																											
300 RFBP 300-262 316-1 UPR-300-32 UPR-300-33 UPR-300-34 UPR-300-35 UPR-300-36 UPR-300-37 UPR-300-FF-1	CVP-2003-00002	Yes	No																																										
300 SE	WSRF 98-080	--[d]	--[d]																																										
300-10	99-105	Yes	No																																										
300-19	WSRF 98-063	--[d]	--[d]																																										
300-223	WSRF 2001-042	Yes	No					**S**																																					
300-23	NA	Yes	No					**S**																																					
300-231	WSRF 99-038	--[d]	--[d]																																										
300-272	WSRF 2002-049	Yes	No					**S**																																					
300-35	WSRF 99-003	--[d]	--[d]																																										
300-37	WSRF 98-231	Yes	No																																										
300-44	WSRF 99-109	Yes	No																																										
300-45	WSRF 99-110	Yes	No																																										
300-49	CVP-2000-00020	Yes	No																																										
300-50	CVP-2000-00021	Yes	No																																										
300-53	WSRF 99-014	--[d]	--[d]																																										
300-57	WSRF 98-174	--[d]	--[d]																																										
303-K CWS	WSRF 2003-031	--[d]	--[d]																																										
304 CF	WSRF 99-094	--[d]	--[d]																																										
304 SA	WSRF 2001-001	--[d]	--[d]																																										
305-B SF	WSRF 2008-051	--[d]	--[d]																																										
311 MT1	WSRF 99-006	--[d]	--[d]																																										
311 MT2	WSRF 99-007	--[d]	--[d]																																										
311-TK-40	WSRF 2001-100	--[d]	--[d]																																										
311-TK-50	WSRF 2001-101	--[d]	--[d]																																										
313 CENTRIFUGE	WSRF 2001-102	--[d]	--[d]																																										
313 FP	WSRF 2001-103	--[d]	--[d]																																										
313 MT	WSRF 99-008	--[d]	--[d]																																										

Table E-1. Analytes Detected Above Background in Soil Samples Used

		Waste Site-Specific Decision Unit(s) Sampled for Reclassification[b]							Other Analytes[c]																																			
Waste site(s)	CVP/WSRF Number (See note e)	Shallow Zone[a]	Deep Zone[b]	Bis(2-ethylhexyl) phthalate	Benzo(a)pyrene	Chrysene	Phenanthrene	TPH	Boron	Molybdenum	Titanium	Chloride	Fluroide	Nitrate	Sulfate	1,1,2,2-tetrachloroethene	Acetone	Methylene chloride	Di-n-butyl phthalate	Isophorone	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(ghi)pherylene	Benzo(k)fluoranthene	Dibenzofuran	Dibenz(a,h)anthracene	Fluorene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Naphthalene	Pyrene	Aldrin	alpha-BHC	gamma-BHC	delta-BHC	4,4'-DDE	Endrin (aldehyde, ketone)	Ensodulfan (I, II, sulfate)	Heptachlor epoxide	Methoxychlor
313 URO	WSRF 99-016	--[d]	--[d]																																									
313-TK-2	WSRF 2001-104	--[d]	--[d]																																									
316-2 618-12 UPR-300-7	WSRF 99-050	Yes	No																																									
316-5 UPR-300-8 UPR-300-9 UPR-300-15 UPR-300-19 UPR-300-20 UPR-300-21 UPR-300-22 UPR-300-23 UPR-300-24 UPR-300-25 UPR-300-26 UPR-300-27 UPR-300-28 UPR-300-29 UPR-300-30 UPR-300-47	WSRF 99-108	Yes	No			S																																						
332 SF	WSRF 98-062	--[d]	--[d]																																									
333-TK-11	WSRF 2001-105	--[d]	--[d]																																									
333-TK-7	WSRF 2001-109	--[d]	--[d]																																									
334 TFWAST	WSRF 2001-106	--[d]	--[d]																																									
334-A-TK-B	WSRF 2001-107	--[d]	--[d]																																									
334-A-TK-C	WSRF 2001-108	--[d]	--[d]																																									
3718-F BS	WSRF 98-085	--[d]	--[d]																																									
3718-F SF	WSRF 98-086	--[d]	--[d]																																									
3718-F TT1	WSRF 98-087	--[d]	--[d]																																									
3718-F TT2	WSRF 98-088	--[d]	--[d]																																									
400-31	NA	--[d]	--[d]																																									
400-5	NA	--[d]	--[d]																																									
427 HWSA	NA	--[d]	--[d]																																									
4831 LHWSA	NA	--[d]	--[d]																																									
600-278	WSRF 2003-054	--[d]	--[d]																																									
600-46	WSRF 98-097	--[d]	--[d]																																									
618-4	CVP-2003-00020	Yes	Yes					S,D																																				
618-9	WSRF 98-075	Yes	No	S			S							S		S	S	S	S																									

Table E-1. Analytes Detected Above Background in Soil Samples Used

		Waste Site-Specific Decision Unit(s) Sampled for Reclassification[b]							Other Analytes[c]																																			
Waste site(s)	CVP/WSRF Number (See note e)	Shallow Zone[a]	Deep Zone[b]	Bis(2-ethylhexyl) phthalate	Benzo(a)pyrene	Chrysene	Phenanthrene	TPH	Boron	Molybdenum	Titanium	Chloride	Fluroide	Nitrate	Sulfate	1,1,2,2-tetrachloroethene	Acetone	Methylene chloride	Di-n-butyl phthalate	Isophorone	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Dibenzofuran	Dibenz(a,h)anthracene	Fluorene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Naphthalene	Pyrene	Aldrin	alpha-BHC	gamma-BHC	delta-BHC	4,4'-DDE	Endrin (aldehyde, ketone)	Ensodulfan (I, II, sulfate)	Heptachlor epoxide	Methoxychlor
628-4	CVP-2003-00001	Yes	No																																									
BTTF	WSRF 98-073	--[d]	--[d]																																									
PCTTF	WSRF 98-074	--[d]	--[d]																																									
TTTF	WSRF 98-072	--[d]	--[d]																																									
UPR-300-41	WSRF 99-011	--[d]	--[d]																																									
UPR-600-11	WSRF 98-215	--[d]	--[d]																																									
300 VTS	CVP-2005-00009	Yes	No																																									
300-109 UPR-300-46	CVP-2010-00004	Yes	No		S	S	S		S	S													S		S	S	S	S		S	S	S	S	S	S									
300-110 303-M SA 303-M UOF 333 LHWSA 333 ESHWSA 618-1 618-1:1 618-1:2 UPR-300-13 UPR-300-14	CVP-2010-00001	Yes	Yes						S,D	S,D			D		D																													
300-18	CVP-2005-00004	Yes	No																																									
300-259	WSRF 2009-059	Yes	No						S	S																																		
300-275	WSRF 2008-059	Yes	No		S	S	S		S	S													S			S	S				S	S												
300-33 300-41 300-256	WSRF 2010-058	Yes	No						S	S								S																										
300-8	CVP-2005-00007	Yes	No																																									
600-243	WSRF 2007-033	Yes	No		S	S	S	S	S	S									S		S			S	S	S	S	S	S			S	S	S	S									
600-259:1 600-259:2	CVP-2005-00008	Yes	No																																									
600-290:1 618-13	CVP-2009-00005	Yes	No						S	S							S																											
600-47	CVP-2005-00005	Yes	No																																									
618-2	CVP-2006-00010	Yes	Yes	S																																								
618-3	CVP-2006-00005	Yes	No																																									
618-5	CVP-2003-00021	Yes	Yes																																									
618-7	CVP-2008-00002	Yes	No	S	S	S	S	S											S				S		S	S	S	S		S		S			S									
618-8	CVP-2006-00006	Yes	No																																									
JA JONES 1	CVP-2001-00019	Yes	No																																									
UPR-300-17	WSRF 2010-014	Yes	No		S	S	S	S	S	S												S	S	S	S	S	S	S			S	S	S		S									

Table E-1. Analytes Detected Above Background in Soil Samples Used

Waste site(s)	CVP/WSRF Number (See note e)	Waste Site-Specific Decision Unit(s) Sampled for Reclassification[b]		Other Analytes[c]																																										
		Shallow Zone[a]	Deep Zone[b]	Bis(2-ethylhexyl) phthalate	Benzo(a)pyrene	Chrysene	Phenanthrene	TPH	Boron	Molybdenum	Titanium	Chloride	Fluroide	Nitrate	Sulfate	1,1,2,2-tetrachloroethene	Acetone	Methylene chloride	Di-n-butyl phthalate	Isophorone	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Dibenzofuran	Dibenz(a,h)anthracene	Fluorene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Naphthalene	Pyrene	Aldrin	alpha-BHC	gamma-BHC	delta-BHC	4,4'-DDE	Endrin (aldehyde, ketone)	Ensodulfan (I, II, sulfate)	Heptachlor epoxide	Methoxychlor
Waste Sites Reclassified as No Action																																														
300 FBP:1	WSRF 98-005	--[d]	--[d]																																										
300 FBP:2	WSRF 2000-116	--[d]	--[d]																																										
300-1	WSRF 98-081	--[d]	--[d]																																										
300-253	WSRF 99-042	--[d]	--[d]																																										
300-260	WSRF 2010-074	Yes	No							S																																			
300-29	NA	--[d]	--[d]																																										
300-3	NA	--[d]	--[d]																																										
300-51	NA	--[d]	--[d]																																										
300-52	NA	--[d]	--[d]																																										
331 LSLDF	WSRF 2008-020	Yes	No	S					S	S							S	S	S	S																S	S	S	S	S	S	S	S	S	
400-36	WSRF 2004-102	--[d]	--[d]																																										
600-22	WSRF 98-219	--[d]	--[d]																																										
UPR-600-15	WSRF 2004-097	--[d]	--[d]																																										

[a] Shallow zone decision units sampled for reclassification include excavated areas generally 15 ft. or less bgs, overburden or below cleanup level soil stockpile, and/or waste staging area footprints, as needed for specific remediation area. For No Action reclassification, data from confirmatory samples collected less than 15 ft. bgs are considered shallow zone.

[b] Deep zone decision units are always located greater than 15 ft bgs.

[c] Radiological results evaluated based on original data without accounting for subsequent decay.

[d] No soil samples were obtained for waste site reclassification.

[e] Complete reference citations are provided in Chapter 11 of the main document.

bgs = below ground surface
CVP = closeout verification package
D = analyte detected or detected above background in soil data from deep zone decision unit(s) used to support site reclassification
S = analyte detected or detected above background in soil data from shallow zone decision unit(s) used to support site reclassification
TPH = total petroleum hydrocarbons
WSRF = waste site reclassification form

Appendix F

Fate and Transport Modeling Documentation

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Contents

Environmental Calculations

ECF-HANFORD-10-0442	*Calculation of Nonradiological Soil Concentrations Protective of Groundwater Using the Fixed Parameter 3-Phase Equilibrium Partitioning Equation for the 100 Areas and 300 Area*
ECF-300FF5-11-0151	*Groundwater Flow and Uranium Transport Modeling in Support of the 300 Aare FF-5 RI/FS Document*
ECF-300FF5-11-0152	*VOC Modeling in Support of 300 Area FF-5 RI/FS Document*
ECF-300FF5-11-0153	*STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for 300 Area Source Areas*
ECF-300NPL-11-0154	*Comparison of the 300-FF-2 Source Operable Unit Exposure Point Concentrations to Soil Screening Levels Protective of Groundwater and Soil Screening Levels Protective of Surface Water*
ECF-300NPL-11-0155	*Comparison of the 300-FF-2 Source Operable Unit Exposure Point Concentrations to Preliminary Remediation Goals Protective of Groundwater and Preliminary Remediation Goals Protective of Surface Water*
ECF-300FF5-12-0043	*Radon Flux Calculation for the 300 Area*

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ECF-HANFORD-10-0442
Revision 1

Calculation of Nonradiological Soil Concentrations Protective of Groundwater Using the Fixed Parameter 3-Phase Equilibrium Partitioning Equation for the 100 Areas and 300 Area

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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**Approved for Public Release;
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ECF-HANFORD-10-0442
Revision 1

Calculation of Nonradiological Soil Concentrations Protective of Groundwater Using the Fixed Parameter 3-Phase Equilibrium Partitioning Equation for the 100 Areas and 300 Area

Document Type: ENV Program/Project: EP&SP

K. M. SCOTT
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Date Published
March 2012

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Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
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Environmental Calculation Cover Page

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Project: 100 and 300 Areas RI/FS **Date:** 7 March 2012

Calculation Title & Description: Calculation of Nonradiological Soil Concentrations Protective of Groundwater Using the Fixed Parameter 3-Phase Equilibrium Partitioning Equation for the 100 Areas and 300 Area

Preparer: Kristin Scott	**Basis of Qualification:** Education & experience
Checker: Ian Ross	**Basis of Qualification:** Education & experience
Senior Reviewer: Doug Evans	**Basis of Qualification:** Education & experience

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0	Initial issue.	9-29-2012	all

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Terms

CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CLARC	Cleanup Levels and Risk Calculations
DF	dilution factor
DOE	U.S. Department of Energy
ECF	environmental calculation file
EPA	U.S. Environmental Protection Agency
K_d	distribution coefficient
MCL	maximum contaminant level
MCLG	maximum contaminant level goal
MRDL	maximum residual disinfectant level
NAPL	non-aqueous phase liquid
ORNL	Oak Ridge National Laboratory
PRG	Preliminary Remediation Goal
RAIS	Risk Assessment Information System
RI/FS	Remedial Investigation/Feasibility Study
WAC	Washington Administrative Code

1 Purpose

This Environmental Calculation documents the methods, assumptions, and results obtained with the fixed parameter three-phase partitioning model as described in the Washington Administrative Code (WAC) Section 173-340-747, "Deriving Soil Concentrations for Ground Water Protection."

Under WAC 173-340-747 the fixed parameter three-phase equation is used to derive soil concentrations protective of groundwater. This Environmental Calculation documents the results from using the equation to derive soil concentrations protective of groundwater. Soil concentrations protective of groundwater are developed in this Environmental Calculation by using the fixed parameter three-phase equation with groundwater cleanup levels rather than surface cleanup levels as specified in WAC 173-340-747. Further details on the calculation methodology are provided in Section 3.

2 Background

Vadose zone transport modeling is performed to estimate concentrations in soil protective of groundwater. Modeling used to develop concentrations in soil for groundwater protection will be developed using a graded approach. In simple terms, the graded approach calls for building models that are only as complex as needed to avoid overly conservative results. The fixed parameter three-phase equation is a highly simplified model with limited data needs, which reflects an initial step in the graded approach. The fixed parameter three-phase equation is drawn from U.S. Environmental Protection Agency (EPA) guidance presented in EPA/540/R-96/018, *Soil Screening Guidance: User's Guide*," and is based on conservative, simplifying assumptions about the release and transport of contaminants in the subsurface.

The concentrations protective of groundwater developed with the fixed parameter three-phase equation may be used as screening levels for data evaluation or as PRGs in the CERCLA RI/FS processes. According to EPA guidance presented in EPA/540/R-92/003, *Risk Assessment Guidance for Superfund, Volume I – Human Health Evaluation Manual, Part B, Development of Risk-Based Preliminary Remediation Goals,* PRGs should be modified, as necessary, as more information becomes available during the RI/FS. State of Washington requirements in WAC 173-340-747(3), "Overview of Methods" provide for a range of methods to calculate concentrations in soil protective of groundwater, and acknowledge that certain methods are tailored for particular types of hazardous substances or sites, which reflect a graded approach.

WAC 173-340-747(3) lists seven methods for deriving soil concentrations. Several of these methods, highlighted in bold below, reflect the graded approach for calculating concentrations in soil protective of groundwater:

- **Fixed parameter three-phase partitioning model** (described in this Environmental Calculation)
- **Variable parameter three-phase partitioning model**
- Four-phase partitioning model (addresses non-aqueous phase liquids or NAPL)
- **Leaching tests**
- **Alternate Fate-and-Transport Model(s)**
- **Empirical demonstration**
- Residual saturation (NAPL)

Depending on site-specific conditions, a more rigorous and detailed modeling approach beyond the fixed parameter three-phase equation may be needed to refine PRGs to support development of final remediation levels or remedial design.

3 Methodology

Soil concentrations for groundwater protection are calculated for nonradiological constituents using Equation 747-1 from WAC 173-340-747(4), "Fixed Parameter Three-Phase Partitioning Model." Default input parameters that are intended to be protective under most circumstances are defined within the equation. In this methodology, soil concentrations protective of groundwater are back calculated from a protective groundwater concentration. The protective groundwater concentration is multiplied by a dilution factor (DF) that represents the reduction in soil leachate concentration caused by mixing in the aquifer, and then a standard linear equilibrium soil/water partitioning equation is used to calculate a soil concentration corresponding to the adjusted groundwater concentration.

Chemical-specific distribution coefficients (K_ds) presented in DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area* are used preferentially in the calculations, and Equation 747-2 from WAC 173-340-747 is used to calculate K_d values for organic constituents if one is not published.

The specific steps taken to calculate soil concentrations protective of groundwater for nonradioactive contaminants using the fixed parameter three-phase equation are as follows:

1. Identify Equation 747-1 and Equation 747-2 from WAC 173-340-747 to derive soil concentrations for groundwater protection.
2. Identify the chemical-specific K_d values from DOE/RL-96-17.
3. For organic contaminants not listed in DOE/RL-96-17, identify the chemical-specific soil organic carbon-water partitioning coefficients for use as an input parameter within Equation 747-2.
4. Identify the input parameters within Equation 747-1 from WAC 173-340-747(4) to calculate soil concentrations for groundwater protection.
5. Identify the lower of the Federal or State MCL or the Standard Method B groundwater cleanup level calculated in accordance with WAC 173-340-720, "Ground Water Cleanup Standards," for each analyte.
6. Calculate soil concentrations for groundwater protection.
7. Document default and chemical-specific input parameters, chemical-specific groundwater cleanup levels, and the primary source in a summary table.

The following sections present the fixed parameter three-phase equation used to derive soil concentrations for groundwater protection and the equation used to calculate chemical-specific K_ds for organic constituents. Definitions of variables and input values for the equations are presented in Table 3-1.

3.1 Equation 747-1—Fixed Parameter Three-Phase Partitioning Model

For nonradiological constituents, soil concentrations for groundwater protection are calculated using Equation 747-1 from WAC 173-340-747 as follows.

$$C_s = C_w(UCF)DF\left[K_d + \frac{(\theta_w + \theta_a H_{cc})}{\rho_b}\right]$$

3.2 Equation 747-2—Distribution Coefficient

For organic constituents, K_ds are calculated using Equation 747-2 from WAC 173-340-747 as follows.

$$K_d = K_{oc} \times f_{oc}$$

Table 3-1. Summary of Parameters Used to Calculate Soil Concentrations for Groundwater Protection

Parameter	Symbol	Value	Units	Source
Contaminant concentration in soil	Cs	Calculated	mg/kg	See Table 4-3
Contaminant concentration in groundwater	Cw	Calculated	µg/L	See Table 4-1
Dilution factor	DF	20	dimensionless	WAC 173-340-747(4) Equation 747-1
Soil fraction of organic carbon	foc	0.001	g/g	WAC 173-340-747(4) Equation 747-2
Henry's law constant	Hcc	Chemical-specific	dimensionless	See Table 4-3
Distribution coefficient	Kd	Chemical-specific	L/kg	DOE/RL-96-17 Rev. 6 Appendix E
Soil organic carbon-water partitioning coefficient	Koc	Chemical-specific	ml/g	See Table 4-3
Dry soil bulk density	ρ_b	1.5	kg/L	WAC 173-340-747(4) Equation 747-1
Unit conversion factor	UCF	0.001	mg/µg	WAC 173-340-747(4) Equation 747-1
Air-filled soil porosity	θ_a	0.13	ml air/ml soil	WAC 173-340-747(4) Equation 747-1
Water-filled soil porosity	θ_w	0.3	ml water/ml soil	WAC 173-340-747(4) Equation 747-1

Notes:

DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*.

WAC 173-340-747(4), "Model Toxics Control Act—Cleanup, Deriving Soil Concentrations for Groundwater Protection, Fixed Parameter Three-Phase Partitioning Model."

4 Assumptions and Inputs

The fixed-parameter three-phase model involves several simplifying assumptions (EPA/540/R-96/018), which are listed below:

- The source is infinite (i.e., steady-state concentrations will be maintained in ground water over the exposure period of interest).
- Contaminants are uniformly distributed throughout the zone of contamination.
- Soil contamination extends from the surface to the water table.
- There is no chemical or biological degradation in the unsaturated zone.
- Equilibrium soil/water partitioning is instantaneous and linear in the contaminated soil.
- The receptor well is at the edge of the source (i.e., there is no dilution from recharge downgradient of the site) and is screened within the plume.
- The aquifer is unconsolidated and unconfined (surficial).
- Aquifer properties are homogeneous and isotropic.
- There is no attenuation (i.e., adsorption or degradation) of contaminants in the aquifer.
- Non-aqueous phase liquids (NAPLs) are not present at the site.

The default input parameters and chemical-specific parameters used to calculate soil concentrations for groundwater protection are presented in Table 3-1 and Tables 4-1 through 4-3. The key assumptions and inputs for the calculations are as follows:

- Default and chemical-specific parameters are used to calculate soil concentrations for groundwater protection. The sources of the input parameters are listed in Table 3-1.
- Air-filled soil porosity, water-filled soil porosity, dry bulk density, and the dilution factor are default values defined in Equation 747-1 and are listed in Table 3-1.
- The protective groundwater concentration used in Equation 747-1 is the lower of the Federal or State MCL or WAC 173-340-720 Standard Method B groundwater cleanup level.
- Federal MCLs represent MCLs, secondary MCLs, and non-zero maximum contaminant level goals (MCLGs) established under the *Safe Drinking Water Act of 1974* and are listed in Table 4-1.
- State MCLs are published under WAC 246-290-310, "Maximum Contaminant Levels (MCLs) and Maximum Residual Disinfectant Levels (MRDLs)" and are listed in Table 4-1.
- Standard Method B groundwater cleanup levels are calculated in accordance with WAC 173-340-720 as documented in ECF-100NPL-10-0462, *Environmental Calculation of WAC 173-374-720 Method B Groundwater Cleanup Levels for Potable Groundwater in the 100 Areas and 300 Area*. These values are listed in Table 4-1.
- With the exception of arsenic, K_d values are obtained preferentially from Appendix E of DOE/RL-96-17 and are listed in Table 4-2. The arsenic K_d value is obtained from the Ecology CLARC database (Ecology, 2010). For organic constituents not identified in DOE/RL-96-17, K_d values are calculated using Equation 747-2. For inorganic constituents not identified in the DOE/RL-96-17, K_d values are obtained directly from tabulated sources (see next bullet).

- Chemical-specific values for Henry's law constant, soil organic carbon-water partitioning coefficient, and K_d for inorganic constituents not identified in DOE/RL-96-17 are obtained from the following sources, in order of preference, and are listed in Table 4-3:
    - Washington State Department of Ecology's "Cleanup Levels and Risk Calculations (CLARC)" web site (Ecology, 2010) (https://fortress.wa.gov/ecy/clarc/CLARCOverview.aspx)
    - EPA's "Regional Screening Levels for Chemical Contaminants at Superfund Sites" web site (EPA, 2010) (http://www.epa.gov/reg3hscd/risk/human/rb-concentration_table/)
    - Oak Ridge National Laboratory's (ORNL) Risk Assessment Information System (RAIS) (ORNL, 2010) (http://rais.ornl.gov/cgi-bin/tools/TOX_search?select=chem)

Table 4-1. Summary of Groundwater Cleanup Levels Used to Calculate Soil Concentrations Protective of Groundwater

CAS #	Constituent Name	Alternate Constituent Name	Units	Basis for Exclusion	WAC 173-340-720[a,b]		National Recommended Water Quality Criteria[c,d,e]		WAC 246-290-310[f]	Final Groundwater Cleanup Level	Final Groundwater Cleanup Level Basis
					Groundwater Method B Unrestricted Land Use	Groundwater Method A Cleanup Levels	Ground Water ARAR - Federal Maximum Contaminant Level Goal (MCLG)	Ground Water ARAR - Federal Primary Maximum Contaminant Level (MCL)	Ground Water ARAR - State Primary Maximum Contaminant Level (MCL)		
71-55-6	1,1,1-Trichloroethane	Trichloroethane;1,1,1-	µg/L	--	16,000	--	200	200	--	200	Federal MCLG
79-34-5	1,1,2,2-Tetrachloroethane	tetrachloroethane;1,1,2,2-	µg/L	--	0.22	--	--	--	--	0.22	WAC 173-340-720(4)(b)(iii)
79-00-5	1,1,2-Trichloroethane	trichloroethane;1,1,2-	µg/L	--	0.77	--	3.0	5.0	--	0.77	WAC 173-340-720(4)(b)(iii)
75-34-3	1,1-Dichloroethane	dichloroethane;1,1-	µg/L	--	1,600	--	--	--	--	1,600	WAC 173-340-720(4)(b)(iii)
75-35-4	1,1-Dichloroethene	Dichloroethene;1,1-	µg/L	--	400	--	7.0	7.0	--	7.0	Federal MCLG
120-82-1	1,2,4-Trichlorobenzene	trichlorobenzene;1,2,4-	µg/L	--	1.5	--	70	70	--	1.5	WAC 173-340-720(4)(b)(iii)
95-50-1	1,2-Dichlorobenzene	dichlorobenzene;1,2- (ortho-Dichlorobenzene)	µg/L	--	720	--	600	600	--	600	Federal MCLG
107-06-2	1,2-Dichloroethane	dichloroethane;1,2-	µg/L	--	0.48	--	--	5.0	--	0.48	WAC 173-340-720(4)(b)(iii)
540-59-0	1,2-Dichloroethene (Total)	dichloroethylene,1,2- (mixed isomers)	µg/L	--	72	--	--	--	--	72	WAC 173-340-720(4)(b)(iii)
78-87-5	1,2-Dichloropropane	dichloropropane;1,2-	µg/L	--	1.2	--	--	5.0	--	1.2	WAC 173-340-720(4)(b)(iii)
541-73-1	1,3-Dichlorobenzene	dichlorobenzene;1,3	µg/L	No Cleanup Level	--	--	--	--	--	--	--
106-46-7	1,4-Dichlorobenzene	dichlorobenzene;1,4- (para-Dichlorobenzene)	µg/L	--	8.1	--	75	75	--	8.1	WAC 173-340-720(4)(b)(iii)
93-76-5	2,4,5-T(2,4,5-Trichlorophenoxyacetic acid)	Trichlorophenoxyacetic Acid, 2,4,5-	µg/L	--	160	--	--	--	--	160	WAC 173-340-720(4)(b)(iii)
93-72-1	2,4,5-TP(2-(2,4,5-Trichlorophenoxy)propionic acid)Silvex	Trichlorophenoxypropionic acid, -2,4,5	µg/L	--	128	--	50	50	--	50	Federal MCLG
95-95-4	2,4,5-Trichlorophenol	Trichlorophenol;2,4,5-	µg/L	--	800	--	--	--	--	800	WAC 173-340-720(4)(b)(iii)
88-06-2	2,4,6-Trichlorophenol	Trichlorophenol2,4,6-	µg/L	--	4.0	--	--	--	--	4.0	WAC 173-340-720(4)(b)(iii)
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	Dichlorophenoxy)butyric Acid, 4-(2,4-	µg/L	--	128	--	--	--	--	128	WAC 173-340-720(4)(b)(iii)
120-83-2	2,4-Dichlorophenol	dichlorophenol;2,4-	µg/L	--	24	--	--	--	--	24	WAC 173-340-720(4)(b)(iii)

Table 4-1. Summary of Groundwater Cleanup Levels Used to Calculate Soil Concentrations Protective of Groundwater

CAS #	Constituent Name	Alternate Constituent Name	Units	Basis for Exclusion	WAC 173-340-720[a,b]		National Recommended Water Quality Criteria[c,d,e]		WAC 246-290-310[f]	Final Groundwater Cleanup Level	Final Groundwater Cleanup Level Basis
					Groundwater Method B Unrestricted Land Use	Groundwater Method A Cleanup Levels	Ground Water ARAR - Federal Maximum Contaminant Level Goal (MCLG)	Ground Water ARAR - Federal Primary Maximum Contaminant Level (MCL)	Ground Water ARAR - State Primary Maximum Contaminant Level (MCL)		
94-75-7	2,4-Dichlorophenoxyacetic acid	Dichlorophenoxy Acetic Acid, 2,4-	µg/L	--	160	--	70	70	--	70	Federal MCLG
105-67-9	2,4-Dimethylphenol	dimethylphenol;2,4-	µg/L	--	160	--	--	--	--	160	WAC 173-340-720(4)(b)(iii)
51-28-5	2,4-Dinitrophenol	dinitrophenol;2,4-	µg/L	--	32	--	--	--	--	32	WAC 173-340-720(4)(b)(iii)
121-14-2	2,4-Dinitrotoluene	dinitrotoluene;2,4-	µg/L	--	0.28	--	--	--	--	0.28	WAC 173-340-720(4)(b)(iii)
606-20-2	2,6-Dinitrotoluene	dinitrotoluene;2,6-	µg/L	--	16	--	--	--	--	16	WAC 173-340-720(4)(b)(iii)
78-93-3	2-Butanone	methyl ethyl ketone (MEK; 2-butanone)	µg/L	--	4,800	--	--	--	--	4,800	WAC 173-340-720(4)(b)(iii)
111-76-2	2-Butoxyethanol	ethylene glycol monobutyl ether (EGBE)	µg/L	--	800	--	--	--	--	800	WAC 173-340-720(4)(b)(iii)
91-58-7	2-Chloronaphthalene	beta-chloronaphthalene	µg/L	--	640	--	--	--	--	640	WAC 173-340-720(4)(b)(iii)
95-57-8	2-Chlorophenol	Chlorophenol;2-	µg/L	--	40	--	--	--	--	40	WAC 173-340-720(4)(b)(iii)
591-78-6	2-Hexanone	HEXANONE;2- [MBK, methyl butyl ketone]	µg/L	--	40	--	--	--	--	40	WAC 173-340-720(4)(b)(iii)
91-57-6	2-Methylnaphthalene	methylnapthalene;2-	µg/L	--	32	--	--	--	--	32	WAC 173-340-720(4)(b)(iii)
95-48-7	2-Methylphenol (cresol, o-)	cresol;o-	µg/L	--	400	--	--	--	--	400	WAC 173-340-720(4)(b)(iii)
88-74-4	2-Nitroaniline	nitroaniline, 2-	µg/L	--	160	--	--	--	--	160	WAC 173-340-720(4)(b)(iii)
88-75-5	2-Nitrophenol	nitrophenol;2-	µg/L	No Cleanup Level	--	--	--	--	--	--	--
91-94-1	3,3'-Dichlorobenzidine	dichlorobenzidine;3,3'-	µg/L	--	0.19	--	--	--	--	0.19	WAC 173-340-720(4)(b)(iii)
65794-96-9	3+4 Methylphenol (cresol, m+p)	methylphenol,3+4 (cresol, m+p)	µg/L	No Cleanup Level	--	--	--	--	--	--	--
99-09-2	3-Nitroaniline	nitroaniline, 3-	µg/L	--	4.2	--	--	--	--	4.2	WAC 173-340-720(4)(b)(iii)

Table 4-1. Summary of Groundwater Cleanup Levels Used to Calculate Soil Concentrations Protective of Groundwater

CAS #	Constituent Name	Alternate Constituent Name	Units	Basis for Exclusion	WAC 173-340-720[a,b]		National Recommended Water Quality Criteria[c,d,e]		WAC 246-290-310[f]	Final Groundwater Cleanup Level	Final Groundwater Cleanup Level Basis
					Groundwater Method B Unrestricted Land Use	Groundwater Method A Cleanup Levels	Ground Water ARAR - Federal Maximum Contaminant Level Goal (MCLG)	Ground Water ARAR - Federal Primary Maximum Contaminant Level (MCL)	Ground Water ARAR - State Primary Maximum Contaminant Level (MCL)		
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	ddd	µg/L	--	0.36	--	--	--	--	0.36	WAC 173-340-720(4)(b)(iii)
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	dde	µg/L	--	0.26	--	--	--	--	0.26	WAC 173-340-720(4)(b)(iii)
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	ddt	µg/L	--	0.26	--	--	--	--	0.26	WAC 173-340-720(4)(b)(iii)
534-52-1	4,6-Dinitro-2-methylphenol	dinitro-2-methylphenol;4,6-	µg/L	--	1.3	--	--	--	--	1.3	WAC 173-340-720(4)(b)(iii)
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	picloram	µg/L	--	1,120	--	500	500	500	500	Federal MCLG
101-55-3	4-Bromophenylphenyl ether	bromodiphenyl ether;4-	µg/L	No Cleanup Level	--	--	--	--	--	--	--
59-50-7	4-Chloro-3-methylphenol	chloro-3-methylphenol;4-	µg/L	--	1,600	--	--	--	--	1,600	WAC 173-340-720(4)(b)(iii)
106-47-8	4-Chloroaniline	chloroaniline;p-	µg/L	--	0.22	--	--	--	--	0.22	WAC 173-340-720(4)(b)(iii)
7005-72-3	4-Chlorophenylphenyl ether	chlorodiphenyl ether;4-	µg/L	No Cleanup Level	--	--	--	--	--	--	--
108-10-1	4-Methyl-2-pentanone	methyl isobutyl ketone	µg/L	--	640	--	--	--	--	640	WAC 173-340-720(4)(b)(iii)
106-44-5	4-Methylphenol (cresol, p-)	cresol;p-	µg/L	--	40	--	--	--	--	40	WAC 173-340-720(4)(b)(iii)
100-01-6	4-Nitroaniline	nitroaniline, 4-	µg/L	--	4.4	--	--	--	--	4.4	WAC 173-340-720(4)(b)(iii)
100-02-7	4-Nitrophenol	nitrophenol;4-	µg/L	--	128	--	--	--	--	128	WAC 173-340-720(4)(b)(iii)
83-32-9	Acenaphthene	acenaphthene	µg/L	--	960	--	--	--	--	960	WAC 173-340-720(4)(b)(iii)
208-96-8	Acenaphthylene	acenaphthylene (Not in CLARC database tables; use acenaphthene as surrogate)	µg/L	No Cleanup Level	--	--	--	--	--	--	--
67-64-1	Acetone	Acetone	µg/L	--	7,200	--	--	--	--	7,200	WAC 173-340-720(4)(b)(iii)

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CAS #	Constituent Name	Alternate Constituent Name	Units	Basis for Exclusion	WAC 173-340-720[a,b]		National Recommended Water Quality Criteria[c,d,e]		WAC 246-290-310[f]	Final Groundwater Cleanup Level	Final Groundwater Cleanup Level Basis
					Groundwater Method B Unrestricted Land Use	Groundwater Method A Cleanup Levels	Ground Water ARAR - Federal Maximum Contaminant Level Goal (MCLG)	Ground Water ARAR - Federal Primary Maximum Contaminant Level (MCL)	Ground Water ARAR - State Primary Maximum Contaminant Level (MCL)		
107-13-1	Acrylonitrile	Acrylonitrile	µg/L	--	0.081	--	--	--	--	0.081	WAC 173-340-720(4)(b)(iii)
309-00-2	Aldrin	aldrin	µg/L	--	0.0026	--	--	--	--	0.0026	WAC 173-340-720(4)(b)(iii)
319-84-6	Alpha-BHC	hexachlorocyclohexane;alpha (alpha-BHC, HCH)	µg/L	--	0.014	--	--	--	--	0.014	WAC 173-340-720(4)(b)(iii)
5103-71-9	Alpha-Chlordane	Alpha-Chlordane	µg/L	--	0.25	--	--	2.0	--	0.25	WAC 173-340-720(4)(b)(iii)
7429-90-5	Aluminum	Aluminum (soluable)	µg/L	--	16,000	--	--	50	--	50	Federal MCL
120-12-7	Anthracene	anthracene	µg/L	--	4,800	--	--	--	--	4,800	WAC 173-340-720(4)(b)(iii)
7440-36-0	Antimony	antimony	µg/L	--	6.4	--	6.0	6.0	6.0	6.0	Federal MCLG
12674-11-2	Aroclor-1016	aroclor 1016 (PCB)	µg/L	--	1.1	--	--	0.50		0.50	Federal MCL
11104-28-2	Aroclor-1221	aroclor 1221 [PCB]	µg/L	--	0.044	--	--	0.50		0.044	WAC 173-340-720(4)(b)(iii)
11141-16-5	Aroclor-1232	aroclor 1232 [PCB]	µg/L	--	0.044	--	--	0.50		0.044	WAC 173-340-720(4)(b)(iii)
53469-21-9	Aroclor-1242	aroclor 1242 [PCB]	µg/L	--	0.044	--	--	0.50		0.044	WAC 173-340-720(4)(b)(iii)
12672-29-6	Aroclor-1248	aroclor 1248 [PCB]	µg/L	--	0.044	--	--	0.50		0.044	WAC 173-340-720(4)(b)(iii)
11097-69-1	Aroclor-1254	aroclor 1254 (PCB)	µg/L	--	0.044	--	--	0.50		0.044	WAC 173-340-720(4)(b)(iii)
11096-82-5	Aroclor-1260	aroclor 1260 (PCB)	µg/L	--	0.044	--	--	0.50		0.044	WAC 173-340-720(4)(b)(iii)
7440-38-2	Arsenic	arsenic, inorganic	µg/L	--	0.058	--	--	10	10	0.058	WAC 173-340-720(4)(b)(iii)
7440-39-3	Barium, compounds	Barium	µg/L	--	3,200	--	2,000	2,000	2,000	2,000	Federal MCLG
71-43-2	Benzene	Benzene	µg/L	--	0.80	--	--	5.0	--	0.80	WAC 173-340-720(4)(b)(iii)
56-55-3	Benzo(a)anthracene	Benzo(a)anthracene	µg/L	--	0.12	--	--	--	--	0.12	WAC 173-340-720(4)(b)(iii)
50-32-8	Benzo(a)pyrene	Benzo(a)pyrene	µg/L	--	0.012	--	--	0.20	--	0.012	WAC 173-340-720(4)(b)(iii)
205-99-2	Benzo(b)fluoranthene	Benzo(b)fluoranthene	µg/L	--	0.12	--	--	--	--	0.12	WAC 173-340-720(4)(b)(iii)

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CAS #	Constituent Name	Alternate Constituent Name	Units	Basis for Exclusion	WAC 173-340-720[a,b]		National Recommended Water Quality Criteria[c,d,e]		WAC 246-290-310[f]	Final Groundwater Cleanup Level	Final Groundwater Cleanup Level Basis
					Groundwater Method B Unrestricted Land Use	Groundwater Method A Cleanup Levels	Ground Water ARAR - Federal Maximum Contaminant Level Goal (MCLG)	Ground Water ARAR - Federal Primary Maximum Contaminant Level (MCL)	Ground Water ARAR - State Primary Maximum Contaminant Level (MCL)		
191-24-2	Benzo(ghi)perylene	BENZO(g,h,i)PERYLENE (using pyrene as a surrogate)	µg/L	No Cleanup Level	--	--	--	--	--	--	--
207-08-9	Benzo(k)fluoranthene	Benzo(k)fluoranthene	µg/L	--	0.12	--	--	--	--	0.12	WAC 173-340-720(4)(b)(iii)
7440-41-7	Beryllium	beryllium	µg/L	--	32	--	4.0	4.0	4.0	4.0	Federal MCLG
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	hexachlorocyclohexane;beta-	µg/L	--	0.049	--	--	--	--	0.049	WAC 173-340-720(4)(b)(iii)
108-60-1	Bis(2-chloro-1-methylethyl)ether	bis(2-chloro-1-methyl-ethyl)ether	µg/L	--	0.63	--	--	--	--	0.63	WAC 173-340-720(4)(b)(iii)
111-91-1	Bis(2-Chloroethoxy)methane	bis(2-chloroethoxyl)methane	µg/L	--	48	--	--	--	--	48	WAC 173-340-720(4)(b)(iii)
111-44-4	Bis(2-chloroethyl) ether	bis(2-chloroethyl)ether	µg/L	--	0.040	--	--	--	--	0.040	WAC 173-340-720(4)(b)(iii)
117-81-7	Bis(2-ethylhexyl) phthalate	bis(2-ethylhexyl) phthalate	µg/L	--	6.3	--	--	6.0	--	6.0	Federal MCL
7440-69-9	Bismuth	Bismuth	µg/L	No Cleanup Level	--	--	--	--	--	--	--
7440-42-8	Boron	Boron	µg/L	--	3,200	--	--	--	--	3,200	WAC 173-340-720(4)(b)(iii)
24959-67-9	Bromide	Bromide	µg/L	No Cleanup Level	--	--	--	--	--	--	--
75-27-4	Bromodichloromethane	bromodichloromethane	µg/L	--	0.71	--	--	80	--	0.71	WAC 173-340-720(4)(b)(iii)
75-25-2	Bromoform	bromoform	µg/L	--	5.5	--	80	--	--	5.5	WAC 173-340-720(4)(b)(iii)
74-83-9	Bromomethane	bromomethane	µg/L	--	11	--	--	--	--	11	WAC 173-340-720(4)(b)(iii)
85-68-7	Butylbenzylphthalate	butyl benzyl phthalate	µg/L	--	46	--	--	--	--	46	WAC 173-340-720(4)(b)(iii)
7440-43-9	Cadmium	cadmium	µg/L	--	8.0	--	5.0	5.0	5.0	5.0	Federal MCLG
7440-70-2	Calcium	Calcium	µg/L	Essential Nutrient	--	--	--	--	--	--	--
86-74-8	Carbazole	carbazole	µg/L	--	4.4	--	--	--	--	4.4	WAC 173-340-

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											720(4)(b)(iii)
75-15-0	Carbon disulfide	carbon disulfide	µg/L	--	800	--	--	--	--	800	WAC 173-340-720(4)(b)(iii)
56-23-5	Carbon tetrachloride	carbon tetrachloride	µg/L	--	0.34	--	--	5.0	--	0.34	WAC 173-340-720(4)(b)(iii)
57-74-9	Chlordane	chlordane	µg/L	--	0.25	--	--	2.0	--	0.25	WAC 173-340-720(4)(b)(iii)
16887-00-6	Chloride	chloride	µg/L	--	--	--	--	--	250,000	250,000	State MCL
108-90-7	Chlorobenzene	chlorobenzene	µg/L	--	160	--	100	100	--	100	Federal MCLG
75-00-3	Chloroethane	ethyl chloride	µg/L	No Cleanup Level	--	--	--	--	--	--	--
67-66-3	Chloroform	chloroform	µg/L	--	1.4	--	--	70	--	1.4	WAC 173-340-720(4)(b)(iii)
74-87-3	Chloromethane	chloromethane	µg/L	No Cleanup Level	--	--	--	--	--	--	--
7440-47-3	Chromium	chromium (total)	µg/L	--	24,000	--	100	100	100	100	Federal MCLG
218-01-9	Chrysene	Chrysene	µg/L	--	1.2	--	--	--	--	1.2	WAC 173-340-720(4)(b)(iii)
156-59-2	cis-1,2-Dichloroethylene	dichloroethylene;1,2-,cis	µg/L	--	80	--	70	70	--	70	Federal MCLG
10061-01-5	cis-1,3-Dichloropropene	dichloropropene;1,2-,cis	µg/L	--	0.44	--	--	--	--	0.44	WAC 173-340-720(4)(b)(iii)
7440-48-4	Cobalt	Cobalt	µg/L	--	4.8	--	--	--	--	4.8	WAC 173-340-720(4)(b)(iii)
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	Co-elution of Aroclor 1242 and Aroclor 1017	µg/L	No Cleanup Level	--	--	--	--	--	--	--
7440-50-8	Copper	copper	µg/L	--	640	--	1,300	1,300	1,300	640	WAC 173-340-720(4)(b)(iii)
57-12-5	Cyanide	cyanide	µg/L	--	320	--	200	200	200	200	Federal MCLG
75-99-0	Dalapon	Dalapon	µg/L	--	240	--	200	200	--	200	Federal MCLG
319-86-8	Delta-BHC	hexachlorocyclohexane;delta-	µg/L	No Cleanup Level	--	--	--	--	--	--	--
53-70-3	Dibenz[a,h]anthracene	Dibenz[a,h]anthracene	µg/L	--	0.12	--	--	--	--	0.12	WAC 173-340-

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132-64-9	Dibenzofuran	dibenzofuran	µg/L	--	16	--	--	--	--	16	WAC 173-340-720(4)(b)(iii)
124-48-1	Dibromochloromethane	chlorodibromomethane [dibromochloromethane]	µg/L	--	0.52	--	60	60	--	0.52	WAC 173-340-720(4)(b)(iii)
1918-00-9	Dicamba	Dicamba	µg/L	--	480	--	--	--	--	480	WAC 173-340-720(4)(b)(iii)
120-36-5	Dichloroprop	Dichloroprop	--	No Cleanup Level	--	--	--	--	--	--	--
60-57-1	Dieldrin	dieldrin	µg/L	--	0.0055	--	--	--	--	0.0055	WAC 173-340-720(4)(b)(iii)
60-29-7	Diethyl ether	ethyl ether	µg/L	--	1,600	--	--	--	--	1,600	WAC 173-340-720(4)(b)(iii)
84-66-2	Diethylphthalate	diethyl phthalate	µg/L	--	12,800	--	--	--	--	12,800	WAC 173-340-720(4)(b)(iii)
131-11-3	Dimethyl phthalate	dimethyl phthalate	µg/L	No Cleanup Level	--	--	--	--	--	--	--
84-74-2	Di-n-butylphthalate	di-butyl phthalate	µg/L	--	1,600	--	--	--	--	1,600	WAC 173-340-720(4)(b)(iii)
117-84-0	Di-n-octylphthalate	di-n-octyl phthalate	µg/L	No Cleanup Level	--	--	--	--	--	--	--
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	Dinoseb	µg/L	--	16	--	7.0	7.0	--	7.0	Federal MCLG
959-98-8	Endosulfan I	Endosulfan I	µg/L	--	96	--	--	--	--	96	WAC 173-340-720(4)(b)(iii)
33213-65-9	Endosulfan II	Endosulfan II	µg/L	--	96	--	--	--	--	96	WAC 173-340-720(4)(b)(iii)
1031-07-8	Endosulfan sulfate	Endosulfan sulfate	µg/L	No Cleanup Level	--	--	--	--	--	--	--
72-20-8	Endrin	endrin	µg/L	--	4.8	--	2.0	2.0	--	2.0	Federal MCLG
7421-93-4	Endrin aldehyde	Endrin aldehyde	µg/L	No Cleanup	--	--	--	--	--	--	--

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				Level							
53494-70-5	Endrin ketone	Endrin ketone	µg/L	No Cleanup Level	--	--	--	--	--	--	--
141-78-6	Ethyl acetate	Ethyl acetate	µg/L	--	7,200	--	--	--	--	7,200	WAC 173-340-720(4)(b)(iii)
107-21-1	Ethylene glycol	Ethelyne glycol	µg/L	--	16,000	--	--	--	--	16,000	WAC 173-340-720(4)(b)(iii)
100-41-4	Ethylbenzene	ethylbenzene	µg/L	--	4.0	--	700	700	--	4.0	WAC 173-340-720(4)(b)(iii)
206-44-0	Fluoranthene	fluoranthene	µg/L	--	640	--	--	--	--	640	WAC 173-340-720(4)(b)(iii)
86-73-7	Fluorene	fluorene	µg/L	--	640	--	--	--	--	640	WAC 173-340-720(4)(b)(iii)
16984-48-8	Fluoride	fluoride (using fluorine)	µg/L	--	960	--	4,000	4,000	4,000	960	WAC 173-340-720(4)(b)(iii)
58-89-9	Gamma-BHC (Lindane)	lindane [gamma-BHC] (see hexachlorocyclohexane)	µg/L	--	0.080	--	0.20	0.20	--	0.080	WAC 173-340-720(4)(b)(iii)
76-44-8	Heptachlor	heptachlor	µg/L	--	0.019	--	--	0.40	--	0.019	WAC 173-340-720(4)(b)(iii)
1024-57-3	Heptachlor epoxide	Heptachlor epoxide	µg/L	--	0.0048	--	--	0.20	--	0.0048	WAC 173-340-720(4)(b)(iii)
118-74-1	Hexachlorobenzene	hexachlorobenzene	µg/L	--	0.055	--	--	1.0	--	0.055	WAC 173-340-720(4)(b)(iii)
87-68-3	Hexachlorobutadiene	hexachlorobutadiene	µg/L	--	0.56	--	--	--	--	0.56	WAC 173-340-720(4)(b)(iii)
77-47-4	Hexachlorocyclopentadiene	hexachlorocyclopentadiene	µg/L	--	48	--	50	50	--	48	WAC 173-340-720(4)(b)(iii)
67-72-1	Hexachloroethane	hexachloroethane	µg/L	--	3.1	--	--	--	--	3.1	WAC 173-340-720(4)(b)(iii)
18540-29-9	Hexavalent Chromium	chromium(VI)	µg/L	--	48	--	--	--	--	48	WAC 173-340-720(4)(b)(iii)
193-39-5	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	µg/L	--	0.12	--	--	--	--	0.12	WAC 173-340-720(4)(b)(iii)
7439-89-6	Iron	Iron	µg/L	--	11,200	--	--	300	300	300	Federal MCL
78-59-1	Isophorone	isophorone	µg/L	--	46	--	--	--	--	46	WAC 173-340-

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											720(4)(b)(iii)
7439-92-1	Lead	lead	µg/L	--	--	15	--	15	15	15	Federal MCL
7439-93-2	Lithium	Lithium	µg/L	--	32	--	--	--	--	32	WAC 173-340-720(4)(b)(iii)
7439-95-4	Magnesium	Magnesium (Not in CLARC database Tables)	µg/L	Essential Nutrient	--	--	--	--	--	--	--
7439-96-5	Manganese	manganese	µg/L	--	2,240	--	--	50	50	50	Federal MCL
7487-94-7	Mercury	Mercury (using mercuric chloride)	µg/L	--	4.8	--	2.0	2.0	2.0	2.0	Federal MCLG
72-43-5	Methoxychlor	methoxychlor	µg/L	--	80	--	40	40	--	40	Federal MCLG
75-09-2	Methylene chloride	methylene chloride	µg/L	--	5.8	--	--	5.0	--	5.0	Federal MCL
7439-98-7	Molybdenum	molybdenum	µg/L	--	80	--	--	--	--	80	WAC 173-340-720(4)(b)(iii)
108-38-3	m-Xylene	Xylene, m-	µg/L	--	1,600	--	--	--	--	1,600	WAC 173-340-720(4)(b)(iii)
91-20-3	Naphthalene	naphthalene	µg/L	--	160	--	--	--	--	160	WAC 173-340-720(4)(b)(iii)
7440-02-0	Nickel	nickel soluble salts	µg/L	--	320	--	--	--	100	100	State MCL
14797-55-8	Nitrate	Nitrate	µg/L	--	113,600	--	45,000	45,000	45,000	45,000	Federal MCL
14797-65-0	Nitrite	Nitrite	µg/L	--	4,800	--	3,300	3,300	3,300	3,300	Federal MCL
98-95-3	Nitrobenzene	Nitrobenzene	µg/L	--	16	--	--	--	--	16	WAC 173-340-720(4)(b)(iii)
NO3-N	Nitrogen in Nitrate	Nitrogen in Nitrate	µg/L	--	25,600	--	10,000	10,000	10,000	10,000	Federal MCL
NO2-N	Nitrogen in Nitrite	Nitrogen in Nitrite	µg/L	--	1,600	--	1,000	1,000	1,000	1,000	Federal MCL
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	Nitrogen in Nitrite and Nitrate	µg/L	--	25,600	--	10,000	10,000	10,000	10,000	Federal MCL
621-64-7	n-Nitrosodi-n-dipropylamine	nitroso-di-n-propylamine;N-	µg/L	--	0.013	--	--	--	--	0.013	WAC 173-340-720(4)(b)(iii)
86-30-6	n-Nitrosodiphenylamine	nitrosodiphenylamine;N-	µg/L	--	18	--	--	--	--	18	WAC 173-340-720(4)(b)(iii)
95-47-6	o-Xylene	xylene,o-	µg/L	--	1,600	--	--	--	--	1,600	WAC 173-340-720(4)(b)(iii)
87-86-5	Pentachlorophenol	pentachlorophenol	µg/L	--	0.73	--	--	1.0	--	0.73	WAC 173-340-720(4)(b)(iii)
%MOISTURE	Percent moisture (wet sample)	Percent moisture (wet	µg/L	No	--	--	--	--	--	--	--

Table 4-1. Summary of Groundwater Cleanup Levels Used to Calculate Soil Concentrations Protective of Groundwater

CAS #	Constituent Name	Alternate Constituent Name	Units	Basis for Exclusion	WAC 173-340-720[a,b]		National Recommended Water Quality Criteria[c,d,e]		WAC 246-290-310[f]	Final Groundwater Cleanup Level	Final Groundwater Cleanup Level Basis
					Groundwater Method B Unrestricted Land Use	Groundwater Method A Cleanup Levels	Ground Water ARAR - Federal Maximum Contaminant Level Goal (MCLG)	Ground Water ARAR - Federal Primary Maximum Contaminant Level (MCL)	Ground Water ARAR - State Primary Maximum Contaminant Level (MCL)		
		sample)		Cleanup Level							
PH	pH Measurement	pH Measurement	µg/L	No Cleanup Level	--	--	--	--	--	--	--
85-01-8	Phenanthrene	Phenanthrene	µg/L	No Cleanup Level	--	--	--	--	--	--	--
108-95-2	Phenol	Phenol	µg/L	--	2,400	--	--	--	--	2,400	WAC 173-340-720(4)(b)(iii)
14265-44-2	Phosphate	Phosphate	µg/L	No Cleanup Level	--	--	--	--	--	--	--
7723-14-0	Phosphorus	phosphorus	µg/L	--	0.16	--	--	--	--	0.16	WAC 173-340-720(4)(b)(iii)
PO4-P	Phosphorus in phosphate	Phosphorus in phosphate	µg/L	No Cleanup Level	--	--	--	--	--	--	--
7440-09-7	Potassium	Potassium	µg/L	Essential Nutrient	--	--	--	--	--	--	--
129-00-0	Pyrene	pyrene	µg/L	--	480	--	--	--	--	480	WAC 173-340-720(4)(b)(iii)
7782-49-2	Selenium	selenium and compounds	µg/L	--	80	--	50	50	50	50	Federal MCLG
7440-21-3	Silicon	Silicon	µg/L	No Cleanup Level	--	--	--	--	--	--	--
7440-22-4	Silver	silver	µg/L	--	80	--	--	100	100	80	WAC 173-340-720(4)(b)(iii)
7440-23-5	Sodium	Sodium	µg/L	Essential Nutrient	--	--	--	--	--	--	--
7440-24-6	Strontium	strontium	µg/L	--	9,600	--	--	--	--	9,600	WAC 173-340-720(4)(b)(iii)
100-42-5	Styrene	styrene	µg/L	--	1,600	--	100	100	--	100	Federal MCLG
14808-79-8	Sulfate	sulfate	µg/L	--	--	--	--	250,000	250,000	250,000	Federal MCL
18496-25-8	Sulfide	Sulfide	--	No Cleanup	--	--	--	--	--	--	--

Table 4-1. Summary of Groundwater Cleanup Levels Used to Calculate Soil Concentrations Protective of Groundwater

CAS #	Constituent Name	Alternate Constituent Name	Units	Basis for Exclusion	WAC 173-340-720[a,b]		National Recommended Water Quality Criteria[c,d,e]		WAC 246-290-310[f]	Final Groundwater Cleanup Level	Final Groundwater Cleanup Level Basis
					Groundwater Method B Unrestricted Land Use	Groundwater Method A Cleanup Levels	Ground Water ARAR - Federal Maximum Contaminant Level Goal (MCLG)	Ground Water ARAR - Federal Primary Maximum Contaminant Level (MCL)	Ground Water ARAR - State Primary Maximum Contaminant Level (MCL)		
				Level							
127-18-4	Tetrachloroethene	tetrachloroethylene	µg/L	--	0.081	--	--	5.0	--	0.081	WAC 173-340-720(4)(b)(iii)
7440-28-0	Thallium	Thallium, soluable salts	µg/L	--	--	--	0.50	2.0	2.0	0.50	Federal MCLG
7440-31-5	Tin	tin	µg/L	--	9,600	--	--	--	--	9,600	WAC 173-340-720(4)(b)(iii)
108-88-3	Toluene	Toluene	µg/L	--	640	--	1,000	1,000	--	640	WAC 173-340-720(4)(b)(iii)
TPH	Total petroleum hydrocarbons	Total petroleum hydrocarbons	--		--	500	--	--	--	500	WAC 173-340-720(3)(b)
TPHDIESEL	Total petroleum hydrocarbons - diesel range	Total petroleum hydrocarbons - diesel range	µg/L	--	--	500	--	--	--	500	WAC 173-340-720(3)(b)
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	Total petroleum hydrocarbons - motor oil (high boiling)	µg/L	--	--	500	--	--	--	500	WAC 173-340-720(3)(b)
8001-35-2	Toxaphene	toxaphene	µg/L	--	0.080	--	--	3.0	--	0.080	WAC 173-340-720(4)(b)(iii)
156-60-5	trans-1,2-Dichloroethylene	dichloroethylene;1,2-,trans	µg/L	--	160	--	100	100	--	100	Federal MCLG
10061-02-6	trans-1,3-Dichloropropene	dichloropropene;1,3-,trans	µg/L	--	0.44	--	--	--	--	0.44	WAC 173-340-720(4)(b)(iii)
126-73-8	Tributyl phosphate	Tributyl phosphate	µg/L	--	9.7	--	--	--	--	9.7	WAC 173-340-720(4)(b)(iii)
79-01-6	Trichloroethene	trichloroethylene (TCE)	µg/L	--	0.49	--	--	5.0	--	0.49	WAC 173-340-720(4)(b)(iii)
75-69-4	Trichloromonofluoromethane	trichlorofluoromethane	µg/L	--	2,400	--	--	--	--	2,400	WAC 173-340-720(4)(b)(iii)
7440-61-1	Uranium	Uranium	µg/L	--	48	--	--	30	--	30	Federal MCL
7440-62-2	Vanadium	vanadium	µg/L	--	80	--	--	--	--	80	WAC 173-340-720(4)(b)(iii)
75-01-4	Vinyl chloride	vinyl chloride [chloroethene; 1-]	µg/L	--	0.061	--	--	2.0	--	0.061	WAC 173-340-720(4)(b)(iii)
1330-20-7	Xylenes (total)	Xylenes (total)	µg/L	--	1,600	--	10,000	10,000	--	1,600	WAC 173-340-720(4)(b)(iii)
7440-66-6	Zinc	zinc	µg/L	--	4,800	--	--	5,000	5,000	4,800	WAC 173-340-720(4)(b)(iii)

Notes:

Table 4-1. Summary of Groundwater Cleanup Levels Used to Calculate Soil Concentrations Protective of Groundwater

CAS #	Constituent Name	Alternate Constituent Name	Units	Basis for Exclusion	WAC 173-340-720[a,b]		National Recommended Water Quality Criteria[c,d,e]		WAC 246-290-310[f]	Final Groundwater Cleanup Level	Final Groundwater Cleanup Level Basis
					Groundwater Method B Unrestricted Land Use	Groundwater Method A Cleanup Levels	Ground Water ARAR - Federal Maximum Contaminant Level Goal (MCLG)	Ground Water ARAR - Federal Primary Maximum Contaminant Level (MCL)	Ground Water ARAR - State Primary Maximum Contaminant Level (MCL)		

a. Standard Method B groundwater cleanup levels calculated per requirements in WAC 173-340-720, "Ground Water Cleanup Standards," as documented in ECF-100NPL-10-0462.
b. WAC 173-340-720(3)(b) Table 720-1, Method A cleanup Levles for Groundwater
c. 40 CFR 141.61, “National Primary Drinking Water Regulations,” “Maximum Contaminant Levels for Organic Contaminants."
d. 40 CFR 141.62, “National Primary Drinking Water Regulations,” “Maximum Contaminant Levels for Inorganic Contaminants."
e. 40 CFR 143.3, “National Secondary Drinking Water Regulations,” “Secondary Maximum Contaminant Levels."
f. WAC 246-290-310, “Group A Public Water Supplies,” “Maximum Contaminant Levels (MCLs) and Maximum Residual Disinfectant Levels (MRDLs)."

Table 4-2. Summary of Soil/Water Distribution Coefficients, DOE/RL-96-17, Rev. 6.

Contaminant	K_d Value (mL/g)	Source
Ag (silver)-108m	90	ANL 1993
Americium-241	200	Hanford Site-specific K_d value: Ames and Serne 1991
Carbon-14	200	Hanford Site-specific K_d value: BHI 2002a
Cesium-137	50	Hanford Site-specific K_d value: Ames and Serne 1991
Cobalt-60	50	Hanford Site-specific K_d value: Ames and Serne 1991
Curium-243	200	Hanford Site-specific K_d value: Kincaid et al. 1998
Europium-152	200	Hanford Site-specific K_d value: Ames and Serne 1991
Europium-154	200	Hanford Site-specific K_d value: Ames and Serne 1991
Europium-155	200	Hanford Site-specific K_d value: Ames and Serne 1991
Iodine-129	1	Hanford Site-specific K_d value: Kincaid et al. 1998
Neptunium-237	15	Hanford Site-specific K_d value: Kincaid et al. 1998
Nickel-63	30	Hanford Site-specific K_d value: Ames and Serne 1991
Niobium-94	200	Hanford Site-specific K_d value: Kincaid et al. 1998
Plutonium-238	200	Hanford Site-specific K_d value: Serne and Wood 1990
Plutonium-239/240	200	Hanford Site-specific K_d value: Serne and Wood 1990
Potassium-40	5.5	Hanford Site-specific K_d value: Kincaid et al. 1998
Sodium-22	10	Hanford Site-specific K_d value: Kincaid et al. 1998
Strontium-90	25	Hanford Site-specific K_d value: Ames and Serne 1991
Technetium-99	0	Hanford Site-specific K_d value: Serne and Wood 1990
Thorium-228	200	Hanford Site-specific K_d value: Ames and Rai 1978
Thorium-232	200	Hanford Site-specific K_d value: Ames and Rai 1978
Tritium (H-3)	0	Hanford Site-specific K_d value: Serne and Wood 1990
Uranium-233/234	2	Hanford Site-specific K_d value: Serne and Wood 1990
Uranium-235	2	Hanford Site-specific K_d value: Serne and Wood 1990
Uranium-238	2	Hanford Site-specific K_d value: Serne and Wood 1990
Metals		
Antimony	3.76	Krupka and Serne 2002
Arsenic	3	Baes and Sharp 1983
Barium	25	Hanford Site-specific K_d value: Ames and Serne 1991
Beryllium	790	Ecology 2009
Boron	3	ORNL 2009
Cadmium	30	Hanford Site-specific K_d value: Ames and Serne 1991

Table 4-2. Summary of Soil/Water Distribution Coefficients, DOE/RL-96-17, Rev. 6.

Contaminant	K_d Value (mL/g)	Source
Chromium, Total	200	EPA 2002
Hexavalent Chromium	0	Hanford Site-specific K_d value: Ames and Serne 1991
Cobalt	50	Hanford Site-specific K_d value: Ames and Serne 1991
Copper	22	Ecology 2009
Lead	30	Hanford Site-specific K_d value: Ames and Serne 1991
Lithium	50	ORNL 2009 (see explanation in text, above)
Manganese	50	Hanford Site-specific K_d value: Ames and Serne 1991
Mercury	30	Hanford Site-specific K_d value: Ames and Serne 1991
Methyl Mercury	0.014	ORNL 2009
Molybdenum	20	ORNL 2009
Nickel	65	Hanford Site-specific K_d value: Ames and Serne 1991
Selenium	5	Ecology 2009
Silver	90	ANL 1993
Strontium	25	Hanford Site-specific K_d value: Ames and Serne 1991
Tin	130	ORNL 2009
Uranium	2	Hanford Site-specific K_d value: Serne and Wood 1990
Vanadium	1,000	Ecology 2009
Zinc	30	Hanford Site-specific K_d value: Ames and Serne 1991
Inorganic Anions and TPH		
Chloride	0	Hanford Site-specific K_d value: Kincaid et al. 1998
Cyanide	9.9	ORNL 2009
Fluoride	150	ORNL 2009
Nitrate	0	(Conservative assumption)
Nitrite	0	(Conservative assumption)
Sulfate	0	(Conservative assumption)
Sulfide	0	(Conservative assumption)
TPH	50	(Conservative assumption)
Volatiles		
Acetone	0.0006	Ecology 2009 (Using K_d = Koc/1000)
Carbon Tetrachloride	0.152	Ecology 2009 (Using K_d = Koc/1000)
Methylene Chloride	0.01	Ecology 2009 (Using K_d = Koc/1000)
Toluene	0.14	Ecology 2009 (Using K_d = Koc/1000)
Xylene	0.233	Ecology 2009 (Using K_d = Koc/1000)
Semivolatiles		
Acenapthene	4.9	Ecology 2009 (Using K_d = Koc/1000)
Acenaphthene	6.12	ORNL 2009 (Using K_d = Koc/1000)
Anthracene	23.5	Ecology 2009 (Using K_d = Koc/1000)

Table 4-2. Summary of Soil/Water Distribution Coefficients, DOE/RL-96-17, Rev. 6.

Contaminant	K_d Value (mL/g)	Source
Benzo(a)anthracene	360	Ecology 2009 (Using K_d = Koc/1000)
Benzo(a)pyrene	5,500	Ecology 2009 (Using K_d = Koc/1000)
Benzo(b)fluoranthene	803	ORNL 2009 (Using K_d = Koc/1000)
Benzo(k)fluoranthene	1,230	Ecology 2009 (Using K_d = Koc/1000)
Benzo(g,h,i)perylene	2,680	ORNL 2009 (Using K_d = Koc/1000)
Bis(2-chloro-1-methylethyl)ether	0.0392	ORNL 2009 (Using K_d = Koc/1000)
Bis(2-chloroethoxy)methane	0.00277	ORNL 2009 (Using K_d = Koc/1000)
Bis(2-chloroethyl) ether	0.076	Ecology 2009 (Using K_d = Koc/1000)
Bis(2-ethylhexyl) phthalate	110	Ecology 2009 (Using K_d = Koc/1000)
Bromophenylphenyl ether; 4-	4.16	ORNL 2009 (Using K_d = Koc/1000)
Butylbenzylphthalate	13.8	Ecology 2009 (Using K_d = Koc/1000)
Carbazole	3.39	Ecology 2009 (Using K_d = Koc/1000)
4-Chloro-3-methylphenol	--	Not available
4-Chloroaniline	0.0725	ORNL 2009 (Using K_d = Koc/1000)
2-Chloronaphthalene	2.98	ORNL 2009 (Using K_d = Koc/1000)
2-Chlorophenol	0.388	Ecology 2009 (Using K_d = Koc/1000)
Chlorophenylphenyl ether; 4-	--	Not available
Chrysene	200	Ecology 2009 (Using K_d = Koc/1000)
Dibenz[a,h]anthracene	1,790	Ecology 2009 (Using K_d = Koc/1000)
Dibenzofuran	11.3	ORNL 2009 (Using K_d = Koc/1000)
1,2-Dichlorobenzene	0.379	Ecology 2009 (Using K_d = Koc/1000)
1,3-Dichlorobenzene	0.434	ORNL 2009 (Using K_d = Koc/1000)
1,4-Dichlorobenzene	0.616	Ecology 2009 (Using K_d = Koc/1000)
3,3'-Dichlorobenzidine	0.724	Ecology 2009 (Using K_d = Koc/1000)
2,4-Dichlorophenol	0.147	Ecology 2009 (Using K_d = Koc/1000)
Diethylphthalate	0.082	Ecology 2009 (Using K_d = Koc/1000)
Dimethylphthalate	0.0371	ORNL 2009 (Using K_d = Koc/1000)
2,4-Dimethylphenol	0.209	Ecology 2009 (Using K_d = Koc/1000)
Di-n-butylphthalate	1.57	Ecology 2009 (Using K_d = Koc/1000)
Di-n-octylphthalate	83,200	Ecology 2009 (Using K_d = Koc/1000)
4,6-Dinitro-2-methylphenol	0.6015	ORNL 2009 (Using K_d = Koc/1000)
2,4-Dinitrophenol	0.00001	Ecology 2009 (Using K_d = Koc/1000)
2,4-Dinitrotoluene	0.0955	Ecology 2009 (Using K_d = Koc/1000)
2,6-Dinitrotoluene	0.0692	Ecology 2009 (Using K_d = Koc/1000)
Ethylene glycol	0.001	ORNL 2009 (Using K_d = Koc/1000)
Fluoranthene	49.1	Ecology 2009 (Using K_d = Koc/1000)

Table 4-2. Summary of Soil/Water Distribution Coefficients, DOE/RL-96-17, Rev. 6.

Contaminant	K_d Value (mL/g)	Source
Fluorene	7.71	Ecology 2009 (Using K_d = Koc/1000)
Hexachlorobenzene	80	Ecology 2009 (Using K_d = Koc/1000)
Hexachlorobutadiene	53.7	Ecology 2009 (Using K_d = Koc/1000)
Hexachlorocyclopentadiene	200	Ecology 2009 (Using K_d = Koc/1000)
Hexachloroethane	1.78	Ecology 2009 (Using K_d = Koc/1000)
Hydrazine	0.0143	ORNL 2009 (Using K_d = Koc/1000)
Indeno(1,2,3-cd)pyrene	3,470	Ecology 2009 (Using K_d = Koc/1000)
Isophorone	0.0468	Ecology 2009 (Using K_d = Koc/1000)
2-Methylnaphthalene	2.98	ORNL 2009 (Using K_d = Koc/1000)
2-Methylphenol (cresol, o-)	0.434	ORNL 2009 (Using K_d = Koc/1000)
4-Methylphenol (cresol, p-)	0.434	ORNL 2009 (Using K_d = Koc/1000)
Naphthalene	1.19	Ecology 2009 (Using K_d = Koc/1000)
2-Nitroaniline	0.0527	ORNL 2009 (Using K_d = Koc/1000)
3-Nitroaniline	0.0516	ORNL 2009 (Using K_d = Koc/1000)
4-Nitroaniline	0.0516	ORNL 2009 (Using K_d = Koc/1000)
Nitrobenzene	0.119	Ecology 2009 (Using K_d = Koc/1000)
2-Nitrophenol	0.309	ORNL 2009 (Using K_d = Koc/1000)
4-Nitrophenol	0.309	ORNL 2009 (Using K_d = Koc/1000)
Nitroso-di-n-propylamine;N-	0.024	Ecology 2009 (Using K_d = Koc/1000)
Nitrosodiphenylamine;N-	1.29	Ecology 2009 (Using K_d = Koc/1000)
Pentachlorophenol	0.592	Ecology 2009 (Using K_d = Koc/1000)
Phenanthrene	23.5	Ecology 2009 (Using K_d = Koc/1000)
Phenol	0.0288	Ecology 2009 (Using K_d = Koc/1000)
Pyrene	68	Ecology 2009 (Using K_d = Koc/1000)
Tributyl Phosphate	1.89	ORNL 2009 (Using K_d = Koc/1000)
1,2,4-Trichlorobenzene	1.66	Ecology 2009 (Using K_d = Koc/1000)
2,4,5-Trichlorophenol	1.6	Ecology 2009 (Using K_d = Koc/1000)
2,4,6-Trichlorophenol	0.381	Ecology 2009 (Using K_d = Koc/1000)
Pesticides and PCBs		
Aldrin	48.7	Ecology 2009 (Using K_d = Koc/1000)
Alpha-BHC	1.76	Ecology 2009 (Using K_d = Koc/1000)
beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	2.14	Ecology 2009 (Using K_d = Koc/1000)
Delta-BHC	3.38	ORNL 2009 (Using K_d = Koc/1000)
BHC, gamma (Lindane)	1.35	Ecology 2009 (Using K_d = Koc/1000)
Chlordane	51	Ecology 2009 (Using K_d = Koc/1000)

Table 4-2. Summary of Soil/Water Distribution Coefficients, DOE/RL-96-17, Rev. 6.

Contaminant	K_d Value (mL/g)	Source
Dalapon	0.00274	ORNL 2009 (Using K_d = Koc/1000)
Db; 2,4-	0.1	ORNL 2009 (Using K_d = Koc/1000)
4,4'-DDD (Dichlorodiphenyldichloroethane)	45.8	Ecology 2009 (Using K_d = Koc/1000)
4,4'-DDE (Dichlorodiphenyldichloroethylene)	86.4	Ecology 2009 (Using K_d = Koc/1000)
4,4'-DDT (Dichlorodiphenyltrichloroethane)	678	Ecology 2009 (Using K_d = Koc/1000)
Dicambra	0.0288	ORNL 2009 (Using K_d = Koc/1000)
Dichlorophenoxyacetic acid; 2,4-	0.0294	ORNL 2009 (Using K_d = Koc/1000)
Dichloroprop	0.0294	ORNL 2009 (Using K_d = Koc/1000)
Dieldrin	25.6	Ecology 2009 (Using K_d = Koc/1000)
Dinoseb (DNBP)	3.54	ORNL 2009 (Using K_d = Koc/1000)
Endosulfan I	2.04	Ecology 2009 (Using K_d = Koc/1000)
Endosulfan II	3.04	Ecology 2009 (Using K_d = Koc/1000)
Endrin	10.8	Ecology 2009 (Using K_d = Koc/1000)
Endrin aldehyde	11.8	Ecology 2009 (Using K_d = Koc/1000)
Heptachlor	9.53	Ecology 2009 (Using K_d = Koc/1000)
Heptachlor epoxide	83.2	Ecology 2009 (Using K_d = Koc/1000)
Methoxychlor	80	Ecology 2009 (Using K_d = Koc/1000)
Polychlorinated Biphenyls	309	Ecology 2009 (Using K_d = Koc/1000)
Aroclor-1016	107	Ecology 2009 (Using K_d = Koc/1000)
Aroclor-1221	10.3	ORNL 2009 (Using K_d = Koc/1000)
Aroclor-1232	10.3	ORNL 2009 (Using K_d = Koc/1000)
Aroclor-1242	44.8	ORNL 2009 (Using K_d = Koc/1000)
Aroclor-1248	43.9	ORNL 2009 (Using K_d = Koc/1000)
Aroclor-1254	75.6	ORNL 2009 (Using K_d = Koc/1000)
Aroclor-1260	822	Ecology 2009 (Using K_d = Koc/1000)
Silvex (tp;2,4,5-)	0.08	ORNL 2009 (Using K_d = Koc/1000)
Toxaphene	95.8	Ecology 2009 (Using K_d = Koc/1000)
Trichlorophenoxyacetic acid;2,4,5-	0.049	ORNL 2009 (Using K_d = Koc/1000)

Notes:

K_d = distribution coefficient

Koc = carbon-water partitioning coefficient

Table 4-2. Summary of Soil/Water Distribution Coefficients, DOE/RL-96-17, Rev. 6.

Contaminant	K_d Value (mL/g)	Source

PCB = polychlorinated biphenyl
TPH = total petroleum hydrocarbons

Table 4-3. Summary of Input Parameters Used for the Fixed Parameter 3-Phse Partitioning Model Calculation

CAS #	Constituent Name	Alternate Constituent Name	Groundwater CUL for Protectiveness (µg/L)	Groundwater CUL for Protectiveness Source	Henry's Law Constant (Dimensionless)	Henry's Law[b,d] Constant Source	RDR/RAWP K_d (DOE/RL-96-17)[a]	K_{oc} (L/kg)	Organic K_d (L/kg) = K_{oc} x f_{oc}	Organic K_d Source[b]	Inorganic K_d (L/kg)	Inorganic K_d Source[b]	Selected K_d (L/kg)	Source of Selected K_d[c]
71-55-6	1,1,1-Trichloroethane	Trichloroethane;1,1,1-	200	Federal MCLG	0.71	CLARC 2010	--	140	0.14	CLARC 2010	--	--	0.14	CLARC 2010
79-34-5	1,1,2,2-Tetrachloroethane	tetrachloroethane;1,1,2,2-	0.22	WAC 173-340-720(4)(b)(iii)	0.014	CLARC 2010	--	79	0.079	CLARC 2010	--	--	0.079	CLARC 2010
79-00-5	1,1,2-Trichloroethane	trichloroethane;1,1,2-	0.77	WAC 173-340-720(4)(b)(iii)	0.037	CLARC 2010	--	75	0.075	CLARC 2010	--	--	0.075	CLARC 2010
75-34-3	1,1-Dichloroethane	dichloroethane;1,1-	1,600	WAC 173-340-720(4)(b)(iii)	0.23	CLARC 2010	--	53	0.053	CLARC 2010	--	--	0.053	CLARC 2010
75-35-4	1,1-Dichloroethene	Dichloroethene;1,1-	7.0	Federal MCLG	1.1	CLARC 2010	--	65	0.065	CLARC 2010	--	--	0.065	CLARC 2010
120-82-1	1,2,4-Trichlorobenzene	trichlorobenzene;1,2,4-	1.5	WAC 173-340-720(4)(b)(iii)	0.058	CLARC 2010	1.7	1,700	1.7	CLARC 2010	--	--	1.7	DOE/RL-96-17
95-50-1	1,2-Dichlorobenzene	dichlorobenzene;1,2- (ortho-Dichlorobenzene)	600	Federal MCLG	0.078	CLARC 2010	0.38	380	0.38	CLARC 2010	--	--	0.38	DOE/RL-96-17
107-06-2	1,2-Dichloroethane	dichloroethane;1,2-	0.48	WAC 173-340-720(4)(b)(iii)	0.040	CLARC 2010	--	38	0.038	CLARC 2010	--	--	0.038	CLARC 2010
540-59-0	1,2-Dichloroethene (Total)	dichloroethylene,1,2- (mixed isomers)	72	WAC 173-340-720(4)(b)(iii)	0.17	EPA 2010	--	40	0.040	EPA 2010	--	--	0.040	EPA 2010
78-87-5	1,2-Dichloropropane	dichloropropane;1,2-	1.2	WAC 173-340-720(4)(b)(iii)	0.12	CLARC 2010	--	47	0.047	CLARC 2010	--	--	0.047	CLARC 2010
541-73-1	1,3-Dichlorobenzene	dichlorobenzene;1,3	--	--	0.11	ORNL 2010	0.43	375	0.38	ORNL 2010	--	--	0.43	DOE/RL-96-17
106-46-7	1,4-Dichlorobenzene	dichlorobenzene;1,4- (para-Dichlorobenzene)	8.1	WAC 173-340-720(4)(b)(iii)	0.10	CLARC 2010	0.62	620	0.62	CLARC 2010	--	--	0.62	DOE/RL-96-17
93-76-5	2,4,5-T(2,4,5-Trichlorophenoxyacetic acid)	Trichlorophenoxyacetic Acid, 2,4,5-	160	WAC 173-340-720(4)(b)(iii)	1.9E-06	EPA 2010	0.049	107	0.11	EPA 2010	--	--	0.049	DOE/RL-96-17
93-72-1	2,4,5-TP(2-(2,4,5-Trichlorophenoxy)propionic acid)Silvex	Trichlorophenoxypropionic acid, -2,4,5	50	Federal MCLG	3.7E-07	EPA 2010	0.080	175.3	0.18	EPA 2010	--	--	0.080	DOE/RL-96-17
95-95-4	2,4,5-Trichlorophenol	Trichlorophenol;2,4,5-	800	WAC 173-340-720(4)(b)(iii)	1.80E-04	CLARC 2010	1.6	1,600	1.6	CLARC 2010	--	--	1.6	DOE/RL-96-17
88-06-2	2,4,6-Trichlorophenol	Trichlorophenol2,4,6-	4.0	WAC 173-340-720(4)(b)(iii)	3.20E-04	CLARC 2010	0.38	380	0.38	CLARC 2010	--	--	0.38	DOE/RL-96-17
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	Dichlorophenoxy)butyric Acid, 4-(2,4-	128	WAC 173-340-720(4)(b)(iii)	2.4E-07	EPA 2010	0.10	98.4	0.098	EPA 2010	--	--	0.10	DOE/RL-96-17
120-83-2	2,4-Dichlorophenol	dichlorophenol;2,4-	24	WAC 173-340-720(4)(b)(iii)	1.30E-04	CLARC 2010	0.15	150	0.15	CLARC 2010	--	--	0.15	DOE/RL-96-17
94-75-7	2,4-Dichlorophenoxyacetic acid	Dichlorophenoxy Acetic Acid, 2,4-	70	Federal MCLG	1.4E-06	EPA 2010	0.029	29.63	0.030	EPA 2010	--	--	0.029	DOE/RL-96-17
105-67-9	2,4-Dimethylphenol	dimethylphenol;2,4-	160	WAC 173-340-720(4)(b)(iii)	8.20E-05	CLARC 2010	0.21	210	0.21	CLARC 2010	--	--	0.21	DOE/RL-96-17
51-28-5	2,4-Dinitrophenol	dinitrophenol;2,4-	32	WAC 173-340-720(4)(b)(iii)	1.80E-05	CLARC 2010	1.00E-05	0.010	1.00E-05	CLARC 2010	--	--	1.00E-05	DOE/RL-96-17
121-14-2	2,4-Dinitrotoluene	dinitrotoluene;2,4-	0.28	WAC 173-340-720(4)(b)(iii)	3.80E-06	CLARC 2010	0.096	96	0.096	CLARC 2010	--	--	0.096	DOE/RL-96-17
606-20-2	2,6-Dinitrotoluene	dinitrotoluene;2,6-	16	WAC 173-340-720(4)(b)(iii)	3.10E-05	CLARC 2010	0.069	69	0.069	CLARC 2010	--	--	0.069	DOE/RL-96-17
78-93-3	2-Butanone	methyl ethyl ketone (MEK; 2-butanone)	4,800	WAC 173-340-720(4)(b)(iii)	0.0023	EPA 2010	--	4.5	0.0045	EPA 2010	--	--	0.0045	EPA 2010

Table 4-3. Summary of Input Parameters Used for the Fixed Parameter 3-Phse Partitioning Model Calculation

CAS #	Constituent Name	Alternate Constituent Name	Groundwater CUL for Protectiveness (µg/L)	Groundwater CUL for Protectiveness Source	Henry's Law Constant (Dimensionless)	Henry's Law[b,d] Constant Source	RDR/RAWP K_d (DOE/RL-96-17)[a]	K_{oc} (L/kg)	Organic K_d (L/kg) = K_{oc} x f_{oc}	Organic K_d Source[b]	Inorganic K_d (L/kg)	Inorganic K_d Source[b]	Selected K_d (L/kg)	Source of Selected K_d[c]
111-76-2	2-Butoxyethanol	ethylene glycol monobutyl ether (EGBE)	800	WAC 173-340-720(4)(b)(iii)	6.54E-05	EPA 2010	--	2.8	0.0028	EPA 2010	--	--	0.0028	EPA 2010
91-58-7	2-Chloronaphthalene	beta-chloronaphthalene	640	WAC 173-340-720(4)(b)(iii)	0.013	EPA 2010	3.0	2,478	2.5	EPA 2010	--	--	3.0	DOE/RL-96-17
95-57-8	2-Chlorophenol	Chlorophenol;2-	40	WAC 173-340-720(4)(b)(iii)	0.016	CLARC 2010	0.39	390	0.39	CLARC 2010	--	--	0.39	DOE/RL-96-17
591-78-6	2-Hexanone	HEXANONE;2- [MBK, methyl butyl ketone]	40	WAC 173-340-720(4)(b)(iii)	0.0038	ORNL 2010	--	15	0.015	EPA 2010	--	--	0.015	EPA 2010
91-57-6	2-Methylnaphthalene	methylnapthalene;2-	32	WAC 173-340-720(4)(b)(iii)	0.021	ORNL 2010	3.0	2,480	2.5	ORNL 2010	--	--	3.0	DOE/RL-96-17
95-48-7	2-Methylphenol (cresol, o-)	cresol;o-	400	WAC 173-340-720(4)(b)(iii)	4.90E-05	CLARC 2010	0.43	91	0.091	CLARC 2010	--	--	0.43	DOE/RL-96-17
88-74-4	2-Nitroaniline	nitroaniline, 2-	160	WAC 173-340-720(4)(b)(iii)	2.40E-06	EPA 2010	0.053	111	0.11	EPA 2010	--	--	0.053	DOE/RL-96-17
88-75-5	2-Nitrophenol	nitrophenol;2-	--	--	5.23E-04	ORNL 2010	0.31	297	0.30	ORNL 2010	--	--	0.31	DOE/RL-96-17
91-94-1	3,3'-Dichlorobenzidine	dichlorobenzidine;3,3'-	0.19	WAC 173-340-720(4)(b)(iii)	1.60E-07	CLARC 2010	0.72	720	0.72	CLARC 2010	--	--	0.72	DOE/RL-96-17
65794-96-9	3+4 Methylphenol (cresol, m+p)	methylphenol,3+4 (cresol, m+p)	--	--	--	--	--	--	--	--	--	--	--	--
99-09-2	3-Nitroaniline	nitroaniline, 3-	4.2	WAC 173-340-720(4)(b)(iii)	3.23E-07	ORNL 2010	0.052	109	0.11	ORNL 2010	--	--	0.052	DOE/RL-96-17
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	ddd	0.36	WAC 173-340-720(4)(b)(iii)	1.60E-04	CLARC 2010	46	46,000	46	CLARC 2010	--	--	46	DOE/RL-96-17
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	dde	0.26	WAC 173-340-720(4)(b)(iii)	8.60E-04	CLARC 2010	86	86,000	86	CLARC 2010	--	--	86	DOE/RL-96-17
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	ddt	0.26	WAC 173-340-720(4)(b)(iii)	3.30E-04	CLARC 2010	678	680,000	680	CLARC 2010	--	--	678	DOE/RL-96-17
534-52-1	4,6-Dinitro-2-methylphenol	dinitro-2-methylphenol;4,6-	1.3	WAC 173-340-720(4)(b)(iii)	5.70E-05	EPA 2010	0.60	754	0.75	EPA 2010	--	--	0.60	DOE/RL-96-17
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	picloram	500	Federal MCLG	2.18E-12	EPA 2010	--	39	0.039	EPA 2010	--	--	0.039	EPA 2010
101-55-3	4-Bromophenylphenyl ether	bromodiphenyl ether;4-	--	--	--	--	--	--	--	--	--	--	--	--
59-50-7	4-Chloro-3-methylphenol	chloro-3-methylphenol;4-	1,600	WAC 173-340-720(4)(b)(iii)	1.0E-04	EPA 2010	--	491.8	0.49	EPA 2010	--	--	0.49	EPA 2010
106-47-8	4-Chloroaniline	chloroaniline;p-	0.22	WAC 173-340-720(4)(b)(iii)	1.40E-05	CLARC 2010	0.073	66	0.066	CLARC 2010	--	--	0.073	DOE/RL-96-17
7005-72-3	4-Chlorophenylphenyl ether	chlorodiphenyl ether;4-	--	--	0.0098	ORNL 2010	--	3,080	3.1	ORNL 2010	--	--	3.1	ORNL 2010
108-10-1	4-Methyl-2-pentanone	methyl isobutyl ketone	640	WAC 173-340-720(4)(b)(iii)	0.0056	EPA 2010	--	13	0.013	EPA 2010	--	--	0.013	EPA 2010
106-44-5	4-Methylphenol (cresol, p-)	cresol;p-	40	WAC 173-340-720(4)(b)(iii)	4.10E-05	EPA 2010	0.43	300	0.30	EPA 2010	--	--	0.43	DOE/RL-96-17
100-01-6	4-Nitroaniline	nitroaniline, 4-	4.4	WAC 173-340-720(4)(b)(iii)	5.20E-08	EPA 2010	0.052	109	0.11	EPA 2010	--	--	0.052	DOE/RL-96-17
100-02-7	4-Nitrophenol	nitrophenol;4-	128	WAC 173-340-720(4)(b)(iii)	1.70E-08	ORNL 2010	0.31	291	0.29	ORNL 2010	--	--	0.31	DOE/RL-96-17
83-32-9	Acenaphthene	acenaphthene	960	WAC 173-340-720(4)(b)(iii)	0.0064	CLARC 2010	6.1	4,900	4.9	CLARC 2010	--	--	6.1	DOE/RL-96-17

Table 4-3. Summary of Input Parameters Used for the Fixed Parameter 3-Phse Partitioning Model Calculation

CAS #	Constituent Name	Alternate Constituent Name	Groundwater CUL for Protectiveness (µg/L)	Groundwater CUL for Protectiveness Source	Henry's Law Constant (Dimensionless)	Henry's Law[b,d] Constant Source	RDR/RAWP K_d (DOE/RL-96-17)[a]	K_{oc} (L/kg)	Organic K_d (L/kg) = K_{oc} x f_{oc}	Organic K_d Source[b]	Inorganic K_d (L/kg)	Inorganic K_d Source[b]	Selected K_d (L/kg)	Source of Selected K_d[c]
208-96-8	Acenaphthylene	acenaphthylene (Not in CLARC database tables; use acenaphthene as surrogate)	--	--	0.0047	ORNL 2010	--	5,030	5.0	ORNL 2010	--	--	5.0	ORNL 2010
67-64-1	Acetone	Acetone	7,200	WAC 173-340-720(4)(b)(iii)	0.0016	CLARC 2010	6.00E-04	0.58	5.80E-04	CLARC 2010	--	--	6.00E-04	DOE/RL-96-17
107-13-1	Acrylonitrile	Acrylonitrile	0.081	WAC 173-340-720(4)(b)(iii)	0.0056	EPA 2010	--	8.5	0.0085	EPA 2010	--	--	0.0085	EPA 2010
309-00-2	Aldrin	aldrin	0.0026	WAC 173-340-720(4)(b)(iii)	0.0070	CLARC 2010	49	49,000	49	CLARC 2010	--	--	49	DOE/RL-96-17
319-84-6	Alpha-BHC	hexachlorocyclohexane;alpha (alpha-BHC, HCH)	0.014	WAC 173-340-720(4)(b)(iii)	4.40E-04	CLARC 2010	1.8	1,800	1.8	CLARC 2010	--	--	1.8	DOE/RL-96-17
5103-71-9	Alpha-Chlordane	Alpha-Chlordane	0.25	WAC 173-340-720(4)(b)(iii)	0.0020	ORNL 2010	51	67,500	68	ORNL 2010	--	--	51	DOE/RL-96-17
7429-90-5	Aluminum	Aluminum (soluble)	50	Federal MCL	0	CLARC 2010	--	--	--	--	1,500	EPA 2010	1,500	EPA 2010
120-12-7	Anthracene	anthracene	4,800	WAC 173-340-720(4)(b)(iii)	0.0027	CLARC 2010	24	23,000	23	CLARC 2010	--	--	24	DOE/RL-96-17
7440-36-0	Antimony	antimony	6.0	Federal MCLG	0	CLARC 2010	3.8	--	--	--	45	CLARC 2010	3.8	DOE/RL-96-17
12674-11-2	Aroclor-1016	aroclor 1016 (PCB)	0.50	Federal MCL	0.0082	EPA 2010	107	110,000	110	CLARC 2010	--	--	107	DOE/RL-96-17
11104-28-2	Aroclor-1221	aroclor 1221 [PCB]	0.044	WAC 173-340-720(4)(b)(iii)	0.030	EPA 2010	10	8,397	8.4	EPA 2010	--	--	10	DOE/RL-96-17
11141-16-5	Aroclor-1232	aroclor 1232 [PCB]	0.044	WAC 173-340-720(4)(b)(iii)	0.030	EPA 2010	10	8,397	8.4	EPA 2010	--	--	10	DOE/RL-96-17
53469-21-9	Aroclor-1242	aroclor 1242 [PCB]	0.044	WAC 173-340-720(4)(b)(iii)	0.0078	EPA 2010	45	78,100	78	EPA 2010	--	--	45	DOE/RL-96-17
12672-29-6	Aroclor-1248	aroclor 1248 [PCB]	0.044	WAC 173-340-720(4)(b)(iii)	0.018	EPA 2010	44	76,530	77	EPA 2010	--	--	44	DOE/RL-96-17
11097-69-1	Aroclor-1254	aroclor 1254 (PCB)	0.044	WAC 173-340-720(4)(b)(iii)	0.012	EPA 2010	76	130,500	131	EPA 2010	--	--	76	DOE/RL-96-17
11096-82-5	Aroclor-1260	aroclor 1260 (PCB)	0.044	WAC 173-340-720(4)(b)(iii)	0.014	EPA 2010	822	820,000	820	CLARC 2010	--	--	822	DOE/RL-96-17
7440-38-2	Arsenic	arsenic, inorganic	0.058	WAC 173-340-720(4)(b)(iii)	0	CLARC 2010	3.0	--	--	--	29	CLARC 2010	29	CLARC 2010
7440-39-3	Barium, compounds	Barium	2,000	Federal MCLG	0	CLARC 2010	25	--	--	--	41	CLARC 2010	25	DOE/RL-96-17
71-43-2	Benzene	Benzene	0.80	WAC 173-340-720(4)(b)(iii)	0.23	CLARC 2010	--	62	0.062	CLARC 2010	--	--	0.062	CLARC 2010
56-55-3	Benzo(a)anthracene	Benzo(a)anthracene	0.12	WAC 173-340-720(4)(b)(iii)	1.40E-04	CLARC 2010	360	360,000	360	CLARC 2010	--	--	360	DOE/RL-96-17
50-32-8	Benzo(a)pyrene	Benzo(a)pyrene	0.012	WAC 173-340-720(4)(b)(iii)	4.60E-05	CLARC 2010	5,500	970,000	970	CLARC 2010	--	--	5,500	DOE/RL-96-17
205-99-2	Benzo(b)fluoranthene	Benzo(b)fluoranthene	0.12	WAC 173-340-720(4)(b)(iii)	0.0046	CLARC 2010	803	1.20E+06	1,200	CLARC 2010	--	--	803	DOE/RL-96-17
191-24-2	Benzo(ghi)perylene	BENZO(g,h,i)PERYLENE (using pyrene as a surrogate)	--	--	1.35E-05	ORNL 2010	--	1.95E+06	1,950	ORNL 2010	--	--	1,950	ORNL 2010
207-08-9	Benzo(k)fluoranthene	Benzo(k)fluoranthene	0.12	WAC 173-340-720(4)(b)(iii)	3.40E-05	CLARC 2010	1,230	1.20E+06	1,200	CLARC 2010	--	--	1,230	DOE/RL-96-17

Table 4-3. Summary of Input Parameters Used for the Fixed Parameter 3-Phse Partitioning Model Calculation

CAS #	Constituent Name	Alternate Constituent Name	Groundwater CUL for Protectiveness (µg/L)	Groundwater CUL for Protectiveness Source	Henry's Law Constant (Dimensionless)	Henry's Law[b,d] Constant Source	RDR/RAWP K_d (DOE/RL-96-17)[a]	K_{oc} (L/kg)	Organic K_d (L/kg) = K_{oc} x f_{oc}	Organic K_d Source[b]	Inorganic K_d (L/kg)	Inorganic K_d Source[b]	Selected K_d (L/kg)	Source of Selected K_d[c]
7440-41-7	Beryllium	beryllium	4.0	Federal MCLG	0	CLARC 2010	790	--	--	--	790	CLARC 2010	790	DOE/RL-96-17
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	hexachlorocyclohexane;beta-	0.049	WAC 173-340-720(4)(b)(iii)	3.10E-05	CLARC 2010	2.1	2,100	2.1	CLARC 2010	--	--	2.1	DOE/RL-96-17
108-60-1	Bis(2-chloro-1-methylethyl)ether	bis(2-chloro-1-methyl-ethyl)ether	0.63	WAC 173-340-720(4)(b)(iii)	0.0030	EPA 2010	0.039	83	0.083	EPA 2010	--	--	0.039	DOE/RL-96-17
111-91-1	Bis(2-Chloroethoxy)methane	bis(2-chloroethoxyl)methane	48	WAC 173-340-720(4)(b)(iii)	1.60E-04	EPA 2010	0.0028	14	0.014	EPA 2010	--	--	0.0028	DOE/RL-96-17
111-44-4	Bis(2-chloroethyl) ether	bis(2-chloroethyl)ether	0.040	WAC 173-340-720(4)(b)(iii)	7.40E-04	CLARC 2010	0.076	76	0.076	CLARC 2010	--	--	0.076	DOE/RL-96-17
117-81-7	Bis(2-ethylhexyl) phthalate	bis(2-ethylhexyl) phthalate	6.0	Federal MCL	4.20E-06	CLARC 2010	110	110,000	110	CLARC 2010	--	--	110	DOE/RL-96-17
7440-69-9	Bismuth	Bismuth	--	--	--	--	--	--	--	--	--	--	--	--
7440-42-8	Boron	Boron	3,200	WAC 173-340-720(4)(b)(iii)	0	CLARC 2010	--	--	--	--	3.0	EPA 2010	3.0	EPA 2010
24959-67-9	Bromide	Bromide	--	--	--	--	--	--	--	--	--	--	--	--
75-27-4	Bromodichloromethane	bromodichloromethane	0.71	WAC 173-340-720(4)(b)(iii)	0.066	CLARC 2010	--	55	0.055	CLARC 2010	--	--	0.055	CLARC 2010
75-25-2	Bromoform	bromoform	5.5	WAC 173-340-720(4)(b)(iii)	0.022	CLARC 2010	--	130	0.13	CLARC 2010	--	--	0.13	CLARC 2010
74-83-9	Bromomethane	bromomethane	11	WAC 173-340-720(4)(b)(iii)	0.26	CLARC 2010	--	9.0	0.0090	CLARC 2010	--	--	0.0090	CLARC 2010
85-68-7	Butylbenzylphthalate	butyl benzyl phthalate	46	WAC 173-340-720(4)(b)(iii)	5.20E-05	CLARC 2010	14	14,000	14	CLARC 2010	--	--	14	DOE/RL-96-17
7440-43-9	Cadmium	cadmium	5.0	Federal MCLG	0	CLARC 2010	30	--	--	--	75	EPA 2010	30	DOE/RL-96-17
7440-70-2	Calcium	Calcium	--	--	--	--	--	--	--	--	--	--	--	--
86-74-8	Carbazole	carbazole	4.4	WAC 173-340-720(4)(b)(iii)	6.30E-07	CLARC 2010	3.4	3,400	3.4	CLARC 2010	--	--	3.4	DOE/RL-96-17
75-15-0	Carbon disulfide	carbon disulfide	800	WAC 173-340-720(4)(b)(iii)	1.2	CLARC 2010	--	46	0.046	CLARC 2010	--	--	0.046	CLARC 2010
56-23-5	Carbon tetrachloride	carbon tetrachloride	0.34	WAC 173-340-720(4)(b)(iii)	1.3	CLARC 2010	0.15	150	0.15	CLARC 2010	--	--	0.15	DOE/RL-96-17
57-74-9	Chlordane	chlordane	0.25	WAC 173-340-720(4)(b)(iii)	0.0020	CLARC 2010	51	51,000	51	CLARC 2010	--	--	51	DOE/RL-96-17
16887-00-6	Chloride	chloride	250,000	State MCL	0	ORNL 2010	0	--	--	--	--	--	0	DOE/RL-96-17
108-90-7	Chlorobenzene	chlorobenzene	100	Federal MCLG	0.15	CLARC 2010	--	220	0.22	CLARC 2010	--	--	0.22	CLARC 2010
75-00-3	Chloroethane	ethyl chloride	--	--	4.5E-01	EPA 2010	--	22	0.022	ORNL 2010	--	--	0.022	ORNL 2010
67-66-3	Chloroform	chloroform	1.4	WAC 173-340-720(4)(b)(iii)	0.15	CLARC 2010	--	53	0.053	CLARC 2010	--	--	0.053	CLARC 2010
74-87-3	Chloromethane	chloromethane	--	--	3.6E-01	ORNL 2010	--	6.0	0.0060	CLARC 2010	--	--	0.0060	CLARC 2010
7440-47-3	Chromium	chromium (total)	100	Federal MCLG	0	CLARC 2010	200	--	--	--	1,000	CLARC 2010	200	DOE/RL-96-17
218-01-9	chrysene	Chrysene	1.2	WAC 173-340-	0.0039	CLARC 2010	200	400,000	400	CLARC 2010	--	--	200	DOE/RL-

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				720(4)(b)(iii)										96-17
156-59-2	cis-1,2-Dichloroethylene	dichloroethylene;1,2-,cis	70	Federal MCLG	0.17	CLARC 2010	--	36	0.036	CLARC 2010	--	--	0.036	CLARC 2010
10061-01-5	cis-1,3-Dichloropropene	dichloropropene;1,2-,cis	0.44	WAC 173-340-720(4)(b)(iii)	0.73	CLARC 2010	--	27	0.027	CLARC 2010	--	--	0.027	CLARC 2010
7440-48-4	cobalt	Cobalt	4.8	WAC 173-340-720(4)(b)(iii)	0	ORNL 2010	50	--	--	--	45	EPA 2010	50	DOE/RL-96-17
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	Co-elution of Aroclor 1242 and Aroclor 1017	--	--	--	--	--	--	--	--	--	--	--	--
7440-50-8	Copper	copper	640	WAC 173-340-720(4)(b)(iii)	0	CLARC 2010	22	--	--	--	22	CLARC 2010	22	DOE/RL-96-17
57-12-5	Cyanide	cyanide	200	Federal MCLG	0.0054	EPA 2010	9.9	--	--	--	9.9	EPA 2010	9.9	DOE/RL-96-17
75-99-0	Dalapon	Dalapon	200	Federal MCLG	2.3E-06	EPA 2010	0.0027	3.231	0.0032	EPA 2010	--	--	0.0027	DOE/RL-96-17
319-86-8	Delta-BHC	hexachlorocyclohexane;delta-	--	--	2.10E-04	ORNL 2010	--	2,810	2.8	ORNL 2010	--	--	2.8	ORNL 2010
53-70-3	Dibenz[a,h]anthracene	Dibenz[a,h]anthracene	0.12	WAC 173-340-720(4)(b)(iii)	6.00E-07	CLARC 2010	1,790	1.80E+06	1,800	CLARC 2010	--	--	1,790	DOE/RL-96-17
132-64-9	Dibenzofuran	dibenzofuran	16	WAC 173-340-720(4)(b)(iii)	0.0087	EPA 2010	11	9,161	9.2	EPA 2010	--	--	11	DOE/RL-96-17
124-48-1	Dibromochloromethane	chlorodibromomethane [dibromochloromethane]	0.52	WAC 173-340-720(4)(b)(iii)	0.032	CLARC 2010	--	63	0.063	CLARC 2010	--	--	0.063	CLARC 2010
1918-00-9	Dicamba	Dicamba	480	WAC 173-340-720(4)(b)(iii)	8.9E-08	EPA 2010	0.029	29.01	0.029	EPA 2010	--	--	0.029	DOE/RL-96-17
120-36-5	Dichloroprop	Dichloroprop	--	--	--	--	0.029	--	--	--	--	--	0.029	DOE/RL-96-17
60-57-1	Dieldrin	dieldrin	0.0055	WAC 173-340-720(4)(b)(iii)	6.20E-04	CLARC 2010	26	26,000	26	CLARC 2010	--	--	26	DOE/RL-96-17
60-29-7	Diethyl ether	ethyl ether	1,600	Method B GW CUL	0.050	EPA 2010	--	9.7	0.0097	EPA 2010	--	--	0.0097	EPA 2010
84-66-2	Diethylphthalate	diethyl phthalate	12,800	WAC 173-340-720(4)(b)(iii)	1.90E-05	CLARC 2010	0.082	82	0.082	CLARC 2010	--	--	0.082	DOE/RL-96-17
131-11-3	Dimethyl phthalate	dimethyl phthalate	--	--	8.05E-06	CLARC 2010	--	32	0.032	ORNL 2010	--	--	0.032	ORNL 2010
84-74-2	Di-n-butylphthalate	di-butyl phthalate	1,600	WAC 173-340-720(4)(b)(iii)	3.90E-08	CLARC 2010	1.6	1,600	1.6	CLARC 2010	--	--	1.6	DOE/RL-96-17
117-84-0	Di-n-octylphthalate	di-n-octyl phthalate	--	--	0.0027	CLARC 2010	--	8.30E+07	83,000	CLARC 2010	--	--	83,000	CLARC 2010
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	Dinoseb	7.0	Federal MCLG	1.9E-05	EPA 2010	3.5	4294	4.3	EPA 2010	--	--	3.5	DOE/RL-96-17
959-98-8	Endosulfan I	Endosulfan I	96	WAC 173-340-720(4)(b)(iii)	4.60E-04	CLARC 2010	2.0	2,000	2.0	CLARC 2010	--	--	2.0	DOE/RL-96-17
33213-65-9	Endosulfan II	Endosulfan II	96	WAC 173-340-720(4)(b)(iii)	4.60E-04	CLARC 2010	2.0	2,000	2.0	CLARC 2010	--	--	2.0	DOE/RL-96-17
1031-07-8	Endosulfan sulfate	Endosulfan sulfate	--	--	1.33E-05	ORNL 2010	2.0	9,850	9.9	ORNL 2010	--	--	2.0	DOE/RL-96-17
72-20-8	Endrin	endrin	2.0	Federal MCLG	3.10E-04	CLARC 2010	11	11,000	11	CLARC 2010	--	--	11	DOE/RL-96-17

Table 4-3. Summary of Input Parameters Used for the Fixed Parameter 3-Phse Partitioning Model Calculation

CAS #	Constituent Name	Alternate Constituent Name	Groundwater CUL for Protectiveness (µg/L)	Groundwater CUL for Protectiveness Source	Henry's Law Constant (Dimensionless)	Henry's Law[b,d] Constant Source	RDR/RAWP K_d (DOE/RL-96-17)[a]	K_{oc} (L/kg)	Organic K_d (L/kg) = K_{oc} x f_{oc}	Organic K_d Source[b]	Inorganic K_d (L/kg)	Inorganic K_d Source[b]	Selected K_d (L/kg)	Source of Selected K_d[c]
7421-93-4	Endrin aldehyde	Endrin aldehyde	--	--	1.71E-04	ORNL 2010	11	3,270	3.3	ORNL 2010	--	--	11	DOE/RL-96-17
53494-70-5	Endrin ketone	Endrin ketone	--	--	8.26E-07	ORNL 2010	--	9,720	9.7	ORNL 2010	--	--	9.7	ORNL 2010
141-78-6	Ethyl acetate	Ethyl acetate	7,200	WAC 173-340-720(4)(b)(iii)	0.0055	EPA 2010	--	5.6	0.0056	EPA 2010	--	--	0.0056	EPA 2010
107-21-1	Ethylene glycol	Ethylene glycol	16,000	WAC 173-340-720(4)(b)(iii)	2.45E-06	EPA 2010	0.0010	1.0	0.0010	ORNL 2010	--	--	0.0010	DOE/RL-96-17
100-41-4	Ethylbenzene	ethylbenzene	4.0	WAC 173-340-720(4)(b)(iii)	0.32	CLARC 2010	--	200	0.20	CLARC 2010	--	--	0.20	CLARC 2010
206-44-0	Fluoranthene	fluoranthene	640	WAC 173-340-720(4)(b)(iii)	6.60E-04	CLARC 2010	49	49,000	49	CLARC 2010	--	--	49	DOE/RL-96-17
86-73-7	Fluorene	fluorene	640	WAC 173-340-720(4)(b)(iii)	0.0026	CLARC 2010	7.7	7,700	7.7	CLARC 2010	--	--	7.7	DOE/RL-96-17
16984-48-8	Fluoride	fluoride (using fluorine)	960	WAC 173-340-720(4)(b)(iii)	0	(Conservative assumption)	150	--	--	--	150	EPA 2010	150	DOE/RL-96-17
58-89-9	Gamma-BHC (Lindane)	lindane [gamma-BHC] (see hexachlorocyclohexane)	0.080	WAC 173-340-720(4)(b)(iii)	5.70E-04	CLARC 2010	1.4	1,400	1.4	CLARC 2010	--	--	1.4	DOE/RL-96-17
76-44-8	Heptachlor	heptachlor	0.019	WAC 173-340-720(4)(b)(iii)	0.045	CLARC 2010	9.5	9,500	9.5	CLARC 2010	--	--	9.5	DOE/RL-96-17
1024-57-3	Heptachlor epoxide	Heptachlor epoxide	0.0048	WAC 173-340-720(4)(b)(iii)	3.90E-04	CLARC 2010	83	83,000	83	CLARC 2010	--	--	83	DOE/RL-96-17
118-74-1	Hexachlorobenzene	hexachlorobenzene	0.055	WAC 173-340-720(4)(b)(iii)	0.054	CLARC 2010	80	80,000	80	CLARC 2010	--	--	80	DOE/RL-96-17
87-68-3	Hexachlorobutadiene	hexachlorobutadiene	0.56	WAC 173-340-720(4)(b)(iii)	0.33	CLARC 2010	54	54,000	54	CLARC 2010	--	--	54	DOE/RL-96-17
77-47-4	Hexachlorocyclopentadiene	hexachlorocyclopentadiene	48	WAC 173-340-720(4)(b)(iii)	1.1	CLARC 2010	200	200,000	200	CLARC 2010	--	--	200	DOE/RL-96-17
67-72-1	Hexachloroethane	hexachloroethane	3.1	WAC 173-340-720(4)(b)(iii)	0.16	CLARC 2010	1.8	1,800	1.8	CLARC 2010	--	--	1.8	DOE/RL-96-17
18540-29-9	Hexavalent Chromium	chromium(VI)	48	WAC 173-340-720(4)(b)(iii)	0	CLARC 2010	0	--	--	--	19	CLARC 2010	0	DOE/RL-96-17
193-39-5	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	0.12	WAC 173-340-720(4)(b)(iii)	6.60E-05	CLARC 2010	3,470	3.50E+06	3,500	CLARC 2010	--	--	3,470	DOE/RL-96-17
7439-89-6	Iron	Iron	300	Federal MCL	0	CLARC 2010	--	--	--	--	25	EPA 2010	25	EPA 2010
78-59-1	Isophorone	isophorone	46	WAC 173-340-720(4)(b)(iii)	2.70E-04	CLARC 2010	0.047	47	0.047	CLARC 2010	--	--	0.047	DOE/RL-96-17
7439-92-1	Lead	lead	15	Federal MCL	0	CLARC 2010	30	--	--	--	10,000	CLARC 2010	30	DOE/RL-96-17
7439-93-2	Lithium	Lithium	32	WAC 173-340-720(4)(b)(iii)	0	ORNL 2010	50	--	--	--	300	EPA 2010	50	DOE/RL-96-17
7439-95-4	Magnesium	Magnesium (Not in CLARC database Tables)	--	--	--	--	--	--	--	--	--	--	--	--
7439-96-5	Manganese	manganese	50	Federal MCL	0	CLARC 2010	50	--	--	--	65	EPA 2010	50	DOE/RL-96-17
7487-94-7	Mercury	Mercury (using mercuric chloride)	2.0	Federal MCLG	0.47	CLARC 2010	30	--	--	--	52	CLARC 2010	30	DOE/RL-96-17
72-43-5	Methoxychlor	methoxychlor	40	Federal MCLG	6.50E-04	CLARC 2010	80	80,000	80	CLARC 2010	--	--	80	DOE/RL-96-17

Table 4-3. Summary of Input Parameters Used for the Fixed Parameter 3-Phse Partitioning Model Calculation

CAS #	Constituent Name	Alternate Constituent Name	Groundwater CUL for Protectiveness (µg/L)	Groundwater CUL for Protectiveness Source	Henry's Law Constant (Dimensionless)	Henry's Law[b,d] Constant Source	RDR/RAWP K_d (DOE/RL-96-17)[a]	K_{oc} (L/kg)	Organic K_d (L/kg) = K_{oc} x f_{oc}	Organic K_d Source[b]	Inorganic K_d (L/kg)	Inorganic K_d Source[b]	Selected K_d (L/kg)	Source of Selected K_d[c]
75-09-2	Methylene chloride	methylene chloride	5.0	Federal MCL	0.090	CLARC 2010	0.010	10	0.010	CLARC 2010	--	--	0.010	DOE/RL-96-17
7439-98-7	Molybdenum	molybdenum	80	WAC 173-340-720(4)(b)(iii)	0	CLARC 2010	20	--	--	--	20	EPA 2010	20	DOE/RL-96-17
108-38-3	m-Xylene	Xylene, m-	1,600	WAC 173-340-720(4)(b)(iii)	0.30	CLARC 2010	--	200	0.20	CLARC 2010	--	--	0.20	CLARC 2010
91-20-3	Naphthalene	naphthalene	160	WAC 173-340-720(4)(b)(iii)	0.020	CLARC 2010	1.2	1,200	1.2	CLARC 2010	--	--	1.2	DOE/RL-96-17
7440-02-0	Nickel	nickel soluble salts	100	State MCL	0	CLARC 2010	65	--	--	--	65	CLARC 2010	65	DOE/RL-96-17
14797-55-8	Nitrate	Nitrate	45,000	Federal MCL	0	(Conservative assumption)	0	--	--	--	--	--	0	DOE/RL-96-17
14797-65-0	Nitrite	Nitrite	3,300	Federal MCL	0	(Conservative assumption)	0	--	--	--	--	--	0	DOE/RL-96-17
98-95-3	Nitrobenzene	Nitrobenzene	16	WAC 173-340-720(4)(b)(iii)	9.80E-04	CLARC 2010	0.12	120	0.12	CLARC 2010	--	--	0.12	DOE/RL-96-17
NO3-N	Nitrogen in Nitrate	Nitrogen in Nitrate	10,000	Federal MCL	0	(Conservative assumption)	0	--	--	--	--	--	0	DOE/RL-96-17
NO2-N	Nitrogen in Nitrite	Nitrogen in Nitrite	1,000	Federal MCL	0	(Conservative assumption)	0	--	--	--	--	--	0	DOE/RL-96-17
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	Nitrogen in Nitrite and Nitrate	10,000	Federal MCL	0	(Conservative assumption)	0	--	--	--	--	--	0	DOE/RL-96-17
621-64-7	n-Nitrosodi-n-dipropylamine	nitroso-di-n-propylamine;N-	0.013	WAC 173-340-720(4)(b)(iii)	9.20E-05	CLARC 2010	0.024	24	0.024	CLARC 2010	--	--	0.024	DOE/RL-96-17
86-30-6	n-Nitrosodiphenylamine	nitrosodiphenylamine;N-	18	WAC 173-340-720(4)(b)(iii)	2.10E-04	CLARC 2010	1.3	1,300	1.3	CLARC 2010	--	--	1.3	DOE/RL-96-17
95-47-6	o-Xylene	xylene,o-	1,600	WAC 173-340-720(4)(b)(iii)	2.1E-01	CLARC 2010	--	240	0.24	CLARC 2010	--	--	0.24	CLARC 2010
87-86-5	Pentachlorophenol	pentachlorophenol	0.73	WAC 173-340-720(4)(b)(iii)	1.00E-06	CLARC 2010	0.59	590	0.59	CLARC 2010	--	--	0.59	DOE/RL-96-17
%MOISTURE	Percent moisture (wet sample)	Percent moisture (wet sample)	--	--	--	--	--	--	--	--	--	--	--	--
PH	pH Measurement	pH Measurement	--	--	--	--	--	--	--	--	--	--	--	--
85-01-8	Phenanthrene	Phenanthrene	--	--	0.0017	ORNL 2010	24	16,700	17	ORNL 2010	--	--	24	DOE/RL-96-17
108-95-2	Phenol	Phenol	2,400	WAC 173-340-720(4)(b)(iii)	1.60E-05	CLARC 2010	0.029	29	0.029	CLARC 2010	--	--	0.029	DOE/RL-96-17
14265-44-2	Phosphate	Phosphate	--	--	--	--	--	--	--	--	--	--	--	--
7723-14-0	Phosphorus	phosphorus	0.16	WAC 173-340-720(4)(b)(iii)	0	(Conservative assumption)	--	--	--	--	3.5	EPA 2010	3.5	EPA 2010
PO4-P	Phosphorus in phosphate	Phosphorus in phosphate	--	--	--	--	--	--	--	--	--	--	--	--
7440-09-7	Potassium	Potassium	--	--	--	--	--	--	--	--	--	--	--	--
129-00-0	Pyrene	pyrene	480	WAC 173-340-720(4)(b)(iii)	4.50E-04	CLARC 2010	68	68,000	68	CLARC 2010	--	--	68	DOE/RL-96-17
7782-49-2	Selenium	selenium and compounds	50	Federal MCLG	0	CLARC 2010	5.0	--	--	--	5.0	CLARC 2010	5.0	DOE/RL-96-17
7440-21-3	Silicon	Silicon	--	--	--	--	--	--	--	--	--	--	--	--
7440-22-4	Silver	silver	80	WAC 173-340-	0	CLARC 2010	90	--	--	--	8.3	CLARC	90	DOE/RL-

Table 4-3. Summary of Input Parameters Used for the Fixed Parameter 3-Phse Partitioning Model Calculation

CAS #	Constituent Name	Alternate Constituent Name	Groundwater CUL for Protectiveness (µg/L)	Groundwater CUL for Protectiveness Source	Henry's Law Constant (Dimensionless)	Henry's Law[b,d] Constant Source	RDR/RAWP K_d (DOE/RL-96-17)[a]	K_{oc} (L/kg)	Organic K_d (L/kg) = K_{oc} x f_{oc}	Organic K_d Source[b]	Inorganic K_d (L/kg)	Inorganic K_d Source[b]	Selected K_d (L/kg)	Source of Selected K_d[c]
				720(4)(b)(iii)								2010		96-17
7440-23-5	Sodium	Sodium	--	--	--	--	--	--	--	--	--	--	--	--
7440-24-6	Strontium	strontium	9,600	WAC 173-340-720(4)(b)(iii)	0	CLARC 2010	25	--	--	--	35	EPA 2010	25	DOE/RL-96-17
100-42-5	Styrene	styrene	100	Federal MCLG	0.11	CLARC 2010	--	910	0.91	CLARC 2010	--	--	0.91	CLARC 2010
14808-79-8	Sulfate	sulfate	250,000	Federal MCL	0	(Conservative assumption)	0	--	--	--	--	--	0	DOE/RL-96-17
18496-25-8	Sulfide	Sulfide	--	--	--	--	0	--	--	--	--	--	0	DOE/RL-96-17
127-18-4	Tetrachloroethene	tetrachloroethylene	0.081	WAC 173-340-720(4)(b)(iii)	0.75	CLARC 2010	--	270	0.27	CLARC 2010	--	--	0.27	CLARC 2010
7440-28-0	Thallium	Thallium, soluable salts	0.50	Federal MCLG	0	CLARC 2010	--	--	--	--	71	CLARC 2010	71	EPA 2010
7440-31-5	Tin	tin	9,600	WAC 173-340-720(4)(b)(iii)	0	CLARC 2010	130	--	--	--	250	EPA 2010	130	DOE/RL-96-17
108-88-3	Toluene	Toluene	640	WAC 173-340-720(4)(b)(iii)	0.27	CLARC 2010	0.14	140	0.14	CLARC 2010	--	--	0.14	DOE/RL-96-17
TPH	Total petroleum hydrocarbons	Total petroleum hydrocarbons	500	WAC 173-340-720(3)(b)	--	--	--	--	--	--	--	--	--	--
TPHDIESEL	Total petroleum hydrocarbons - diesel range	Total petroleum hydrocarbons - diesel range	500	WAC 173-340-720(3)(b)	--	--	--	--	--	--	--	--	--	--
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	Total petroleum hydrocarbons - motor oil (high boiling)	500	WAC 173-340-720(3)(b)	--	--	--	--	--	--	--	--	--	--
8001-35-2	Toxaphene	toxaphene	0.080	WAC 173-340-720(4)(b)(iii)	2.50E-04	CLARC 2010	96	96,000	96	CLARC 2010	--	--	96	DOE/RL-96-17
156-60-5	trans-1,2-Dichloroethylene	dichloroethylene;1,2-,trans	100	Federal MCLG	0.39	CLARC 2010	--	38	0.038	CLARC 2010	--	--	0.038	CLARC 2010
10061-02-6	trans-1,3-Dichloropropene	dichloropropene;1,3-,trans	0.44	WAC 173-340-720(4)(b)(iii)	0.73	CLARC 2010	--	27	0.027	CLARC 2010	--	--	0.027	CLARC 2010
126-73-8	Tributyl phosphate	Tributyl phosphate	9.7	WAC 173-340-720(4)(b)(iii)	5.76E-05	EPA 2010	1.9	2,350	2.4	EPA 2010	--	--	1.9	DOE/RL-96-17
79-01-6	Trichloroethene	trichloroethylene (TCE)	0.49	WAC 173-340-720(4)(b)(iii)	0.42	CLARC 2010	--	94	0.094	CLARC 2010	--	--	0.094	CLARC 2010
75-69-4	Trichloromonofluoromethane	trichlorofluoromethane	2,400	WAC 173-340-720(4)(b)(iii)	4.0	EPA 2010	--	44	0.044	EPA 2010	--	--	0.044	EPA 2010
7440-61-1	Uranium	Uranium	30	Federal MCL	0	CLARC 2010	2.0	--	--	--	450	EPA 2010	2.0	DOE/RL-96-17
7440-62-2	Vanadium	vanadium	80	WAC 173-340-720(4)(b)(iii)	0	CLARC 2010	1,000	--	--	--	1,000	CLARC 2010	1,000	DOE/RL-96-17
75-01-4	Vinyl chloride	vinyl chloride [chloroethene; 1-]	0.061	WAC 173-340-720(4)(b)(iii)	1.1	CLARC 2010	--	19	0.019	CLARC 2010	--	--	0.019	CLARC 2010
1330-20-7	Xylenes (total)	Xylenes (total)	1,600	WAC 173-340-720(4)(b)(iii)	0.28	CLARC 2010	0.23	230	0.23	CLARC 2010	--	--	0.23	DOE/RL-96-17
7440-66-6	Zinc	zinc	4,800	WAC 173-340-720(4)(b)(iii)	0	CLARC 2010	30	--	--	--	62	CLARC 2010	30	DOE/RL-96-17

Notes:

a. Table E-2, DOE/RL-96-17 Rev. 6, Remedial Design Report/Remedial Action Work Plan

Table 4-3. Summary of Input Parameters Used for the Fixed Parameter 3-Phse Partitioning Model Calculation

CAS #	Constituent Name	Alternate Constituent Name	Groundwater CUL for Protectiveness (µg/L)	Groundwater CUL for Protectiveness Source	Henry's Law Constant (Dimensionless)	Henry's Law[b,d] Constant Source	RDR/RAWP K_d (DOE/RL-96-17)[a]	K_{oc} (L/kg)	Organic K_d (L/kg) = K_{oc} x f_{oc}	Organic K_d Source[b]	Inorganic K_d (L/kg)	Inorganic K_d Source[b]	Selected K_d (L/kg)	Source of Selected K_d[c]

(RDR/RAWP) for the 100 Area

b. Chemical-specific parameters (H_{cc}, K_d, and K_{oc}) were obtained from the following sources, in order of preference:

1. Ecology, 2010, Cleanup Levels and Risk Calculations (CLARC) Database, Washington State Department of Ecology, Olympia, Washington, available on the internet at <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.
2. EPA, 2010, "Regional Screening Levels for Chemical Contaminants at Superfund Sites", screening level/preliminary remediation goal website, updated May 27, 2010
3. ORNL, 2010, Risk Assessment Information System, Oak Ridge National Laboratory, Oak Ridge, Tennessee, available on the internet at < http://rais.ornl.gov/ >.

c. The final selected soil/water distribution coefficinets (Kd) were obtained from the RDR/RAWP. If a kd is not identified in the RDR/RAWP, a Kd is calculated using the method described in Section 4 of this environmental calculation.

d. A Henry's Law Constant was not identified in the three tabulated sources for fluoride, nitrate, nitrite, nitrogen as nitrate, nitrogen as nitrite, nitrogen as nitrite and nitrate, phosphorous, and sulfate. A value of zero was use as a conservative assumption for these constituents.

K_d = distribution coefficient

K_{oc} = carbon-water partitioning coefficient

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5 Software Applications

All supporting calculations are performed on electronic spreadsheets using Microsoft Excel®.

6 Calculation

Soil concentrations for groundwater protection are calculated using the methodology and equations presented in Section 3 and the assumptions and inputs presented in Section 4. Results of the calculations are discussed in Section 7. The spreadsheet calculations are validated by comparison with hand calculations. The hand calculations are provided in Figure 6-1.

7 Results/Conclusions

Results of the fixed parameter three-phase partitioning model calculations are presented in Table 7-1. The concentrations in soil calculated with this equation are highly conservative values that are calculated with assumptions which potentially overstate the potential impacts to groundwater from contaminants in soil under actual waste site conditions. These conservative assumptions are listed in Section 4, and are discussed in further detail in EPA/540/R-96/018. The dilution factor is also a default value; site-specific values for dilution factors can be calculated according to the variable parameter three-phase partitioning model, as described in WAC-173-340-747(5), "Variable Parameter Three-Phase Partitioning Model." As described in EPA/540/R-96/018, the concentrations in soil calculated with this equation are most useful as screening levels for identifying sites and locations where further evaluation of potential impacts to groundwater from contaminants in soil may be warranted. Therefore, the concentrations in soil calculated with the fixed parameter three-phase model may be useful in identifying contaminants of potential concern which should be evaluated further using more refined modeling within a graded approach.

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Table 7-1. Fixed Parameter 3-Phase Partitioning Model Calculation for Soil Concentrations Protective of Groundwater

CAS #	Constituent Name	Alternate Constituent Name	Soil Concentration Protective of Groundwater (mg/kg)
71-55-6	1,1,1-Trichloroethane	Trichloroethane;1,1,1-	1.6
79-34-5	1,1,2,2-Tetrachloroethane	tetrachloroethane;1,1,2,2-	0.0012
79-00-5	1,1,2-Trichloroethane	trichloroethane;1,1,2-	0.0043
75-34-3	1,1-Dichloroethane	dichloroethane;1,1-	8.7
75-35-4	1,1-Dichloroethene	Dichloroethene;1,1-	0.050
120-82-1	1,2,4-Trichlorobenzene	trichlorobenzene;1,2,4-	0.056
95-50-1	1,2-Dichlorobenzene	dichlorobenzene;1,2- (ortho-Dichlorobenzene)	7.0
107-06-2	1,2-Dichloroethane	dichloroethane;1,2-	0.0023
540-59-0	1,2-Dichloroethene (Total)	dichloroethylene,1,2- (mixed isomers)	0.37
78-87-5	1,2-Dichloropropane	dichloropropane;1,2-	0.0063
541-73-1	1,3-Dichlorobenzene	dichlorobenzene;1,3	--
106-46-7	1,4-Dichlorobenzene	dichlorobenzene;1,4- (para-Dichlorobenzene)	0.13
93-76-5	2,4,5-T(2,4,5-Trichlorophenoxyacetic acid)	Trichlorophenoxyacetic Acid, 2,4,5-	0.80
93-72-1	2,4,5-TP(2-(2,4,5-Trichlorophenoxy)propionic acid)Silvex	Trichlorophenoxypropionic acid, -2,4,5	0.28
95-95-4	2,4,5-Trichlorophenol	Trichlorophenol;2,4,5-	29
88-06-2	2,4,6-Trichlorophenol	Trichlorophenol2,4,6-	0.046
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	Dichlorophenoxy)butyric Acid, 4-(2,4-	0.77
120-83-2	2,4-Dichlorophenol	dichlorophenol;2,4-	0.17
94-75-7	2,4-Dichlorophenoxyacetic acid	Dichlorophenoxy Acetic Acid, 2,4-	0.32
105-67-9	2,4-Dimethylphenol	dimethylphenol;2,4-	1.3
51-28-5	2,4-Dinitrophenol	dinitrophenol;2,4-	0.13
121-14-2	2,4-Dinitrotoluene	dinitrotoluene;2,4-	0.0017
606-20-2	2,6-Dinitrotoluene	dinitrotoluene;2,6-	0.086
78-93-3	2-Butanone	methyl ethyl ketone (MEK; 2-butanone)	20

Table 7-1. Fixed Parameter 3-Phase Partitioning Model Calculation for Soil Concentrations Protective of Groundwater

CAS #	Constituent Name	Alternate Constituent Name	Soil Concentration Protective of Groundwater (mg/kg)
111-76-2	2-Butoxyethanol	ethylene glycol monobutyl ether (EGBE)	3.2
91-58-7	2-Chloronaphthalene	beta-chloronaphthalene	41
95-57-8	2-Chlorophenol	Chlorophenol;2-	0.47
591-78-6	2-Hexanone	HEXANONE;2- [MBK, methyl butyl ketone]	0.17
91-57-6	2-Methylnaphthalene	methylnapthalene;2-	2.0
95-48-7	2-Methylphenol (cresol, o-)	cresol;o-	5.1
88-74-4	2-Nitroaniline	nitroaniline, 2-	0.81
88-75-5	2-Nitrophenol	nitrophenol;2-	--
91-94-1	3,3'-Dichlorobenzidine	dichlorobenzidine;3,3'-	0.0036
65794-96-9	3+4 Methylphenol (cresol, m+p)	methylphenol,3+4 (cresol, m+p)	--
99-09-2	3-Nitroaniline	nitroaniline, 3-	0.021
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	ddd	0.34
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	dde	0.45
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	ddt	3.5
534-52-1	4,6-Dinitro-2-methylphenol	dinitro-2-methylphenol;4,6-	0.021
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	picloram	2.4
101-55-3	4-Bromophenylphenyl ether	bromodiphenyl ether;4-	--
59-50-7	4-Chloro-3-methylphenol	chloro-3-methylphenol;4-	22
106-47-8	4-Chloroaniline	chloroaniline;p-	0.0012
7005-72-3	4-Chlorophenylphenyl ether	chlorodiphenyl ether;4-	--
108-10-1	4-Methyl-2-pentanone	methyl isobutyl ketone	2.7
106-44-5	4-Methylphenol (cresol, p-)	cresol;p-	0.51
100-01-6	4-Nitroaniline	nitroaniline, 4-	0.022
100-02-7	4-Nitrophenol	nitrophenol;4-	1.3

Table 7-1. Fixed Parameter 3-Phase Partitioning Model Calculation for Soil Concentrations Protective of Groundwater

CAS #	Constituent Name	Alternate Constituent Name	Soil Concentration Protective of Groundwater (mg/kg)
83-32-9	Acenaphthene	acenaphthene	121
208-96-8	Acenaphthylene	acenaphthylene (Not in CLARC database tables; use acenaphthene as surrogate)	--
67-64-1	Acetone	Acetone	29
107-13-1	Acrylonitrile	Acrylonitrile	3.39E-04
309-00-2	Aldrin	aldrin	0.0025
319-84-6	Alpha-BHC	hexachlorocyclohexane;alpha (alpha-BHC, HCH)	5.44E-04
5103-71-9	Alpha-Chlordane	Alpha-Chlordane	0.26
7429-90-5	Aluminum	Aluminum (soluble)	1,500
120-12-7	Anthracene	anthracene	2,275
7440-36-0	Antimony	antimony	0.48
12674-11-2	Aroclor-1016	aroclor 1016 (PCB)	1.1
11104-28-2	Aroclor-1221	aroclor 1221 [PCB]	0.0092
11141-16-5	Aroclor-1232	aroclor 1232 [PCB]	0.0092
53469-21-9	Aroclor-1242	aroclor 1242 [PCB]	0.039
12672-29-6	Aroclor-1248	aroclor 1248 [PCB]	0.039
11097-69-1	Aroclor-1254	aroclor 1254 (PCB)	0.066
11096-82-5	Aroclor-1260	aroclor 1260 (PCB)	0.72
7440-38-2	Arsenic	arsenic, inorganic	0.034
7440-39-3	Barium, compounds	Barium	1,008
71-43-2	Benzene	Benzene	0.0045
56-55-3	Benzo(a)anthracene	Benzo(a)anthracene	0.86
50-32-8	Benzo(a)pyrene	Benzo(a)pyrene	1.3
205-99-2	Benzo(b)fluoranthene	Benzo(b)fluoranthene	1.9

Table 7-1. Fixed Parameter 3-Phase Partitioning Model Calculation for Soil Concentrations Protective of Groundwater

CAS #	Constituent Name	Alternate Constituent Name	Soil Concentration Protective of Groundwater (mg/kg)
191-24-2	Benzo(ghi)perylene	BENZO(g,h,i)PERYLENE (using pyrene as a surrogate)	--
207-08-9	Benzo(k)fluoranthene	Benzo(k)fluoranthene	2.9
7440-41-7	Beryllium	beryllium	63
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	hexachlorocyclohexane;beta-	0.0023
108-60-1	Bis(2-chloro-1-methylethyl)ether	bis(2-chloro-1-methyl-ethyl)ether	0.0030
111-91-1	Bis(2-Chloroethoxy)methane	bis(2-chloroethoxyl)methane	0.19
111-44-4	Bis(2-chloroethyl) ether	bis(2-chloroethyl)ether	2.20E-04
117-81-7	Bis(2-ethylhexyl) phthalate	bis(2-ethylhexyl) phthalate	13
7440-69-9	Bismuth	Bismuth	--
7440-42-8	Boron	Boron	205
24959-67-9	Bromide	Bromide	--
75-27-4	Bromodichloromethane	bromodichloromethane	0.0037
75-25-2	Bromoform	bromoform	0.037
74-83-9	Bromomethane	bromomethane	0.052
85-68-7	Butylbenzylphthalate	butyl benzyl phthalate	13
7440-43-9	Cadmium	cadmium	3.0
7440-70-2	Calcium	Calcium	--
86-74-8	Carbazole	carbazole	0.31
75-15-0	Carbon disulfide	carbon disulfide	5.6
56-23-5	Carbon tetrachloride	carbon tetrachloride	0.0031
57-74-9	Chlordane	chlordane	0.26
16887-00-6	Chloride	chloride	1,000
108-90-7	Chlorobenzene	chlorobenzene	0.87

Table 7-1. Fixed Parameter 3-Phase Partitioning Model Calculation for Soil Concentrations Protective of Groundwater

CAS #	Constituent Name	Alternate Constituent Name	Soil Concentration Protective of Groundwater (mg/kg)
75-00-3	Chloroethane	ethyl chloride	--
67-66-3	Chloroform	chloroform	0.0075
74-87-3	Chloromethane	chloromethane	--
7440-47-3	Chromium	chromium (total)	400
218-01-9	chrysene	Chrysene	4.8
156-59-2	cis-1,2-Dichloroethylene	dichloroethylene;1,2-,cis	0.35
10061-01-5	cis-1,3-Dichloropropene	dichloropropene;1,2-,cis	0.0025
7440-48-4	cobalt	Cobalt	4.8
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	Co-elution of Aroclor 1242 and Aroclor 1017	--
7440-50-8	Copper	copper	284
57-12-5	Cyanide	cyanide	40
75-99-0	Dalapon	Dalapon	0.81
319-86-8	Delta-BHC	hexachlorocyclohexane;delta-	--
53-70-3	Dibenz[a,h]anthracene	Dibenz[a,h]anthracene	4.3
132-64-9	Dibenzofuran	dibenzofuran	3.7
124-48-1	Dibromochloromethane	chlorodibromomethane [dibromochloromethane]	0.0028
1918-00-9	Dicamba	Dicamba	2.2
120-36-5	Dichloroprop	Dichloroprop	--
60-57-1	Dieldrin	dieldrin	0.0028
60-29-7	Diethyl ether	ethyl ether	6.8
84-66-2	Diethylphthalate	diethyl phthalate	72
131-11-3	Dimethyl phthalate	dimethyl phthalate	--
84-74-2	Di-n-butylphthalate	di-butyl phthalate	57
117-84-0	Di-n-octylphthalate	di-n-octyl phthalate	--

Table 7-1. Fixed Parameter 3-Phase Partitioning Model Calculation for Soil Concentrations Protective of Groundwater

CAS #	Constituent Name	Alternate Constituent Name	Soil Concentration Protective of Groundwater (mg/kg)
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	Dinoseb	0.52
959-98-8	Endosulfan I	Endosulfan I	4.3
33213-65-9	Endosulfan II	Endosulfan II	4.3
1031-07-8	Endosulfan sulfate	Endosulfan sulfate	--
72-20-8	Endrin	endrin	0.44
7421-93-4	Endrin aldehyde	Endrin aldehyde	--
53494-70-5	Endrin ketone	Endrin ketone	--
141-78-6	Ethyl acetate	Ethyl acetate	30
107-21-1	Ethylene glycol	Ethylene glycol	64
100-41-4	Ethylbenzene	ethylbenzene	0.034
206-44-0	Fluoranthene	fluoranthene	631
86-73-7	Fluorene	fluorene	101
16984-48-8	Fluoride	fluoride (using fluorine)	2,884
58-89-9	Gamma-BHC (Lindane)	lindane [gamma-BHC] (see hexachlorocyclohexane)	0.0025
76-44-8	Heptachlor	heptachlor	0.0038
1024-57-3	Heptachlor epoxide	Heptachlor epoxide	0.0080
118-74-1	Hexachlorobenzene	hexachlorobenzene	0.088
87-68-3	Hexachlorobutadiene	hexachlorobutadiene	0.60
77-47-4	Hexachlorocyclopentadiene	hexachlorocyclopentadiene	192
67-72-1	Hexachloroethane	hexachloroethane	0.12
18540-29-9	Hexavalent Chromium	chromium(VI)	0.19
193-39-5	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	8.3
7439-89-6	Iron	Iron	151

Table 7-1. Fixed Parameter 3-Phase Partitioning Model Calculation for Soil Concentrations Protective of Groundwater

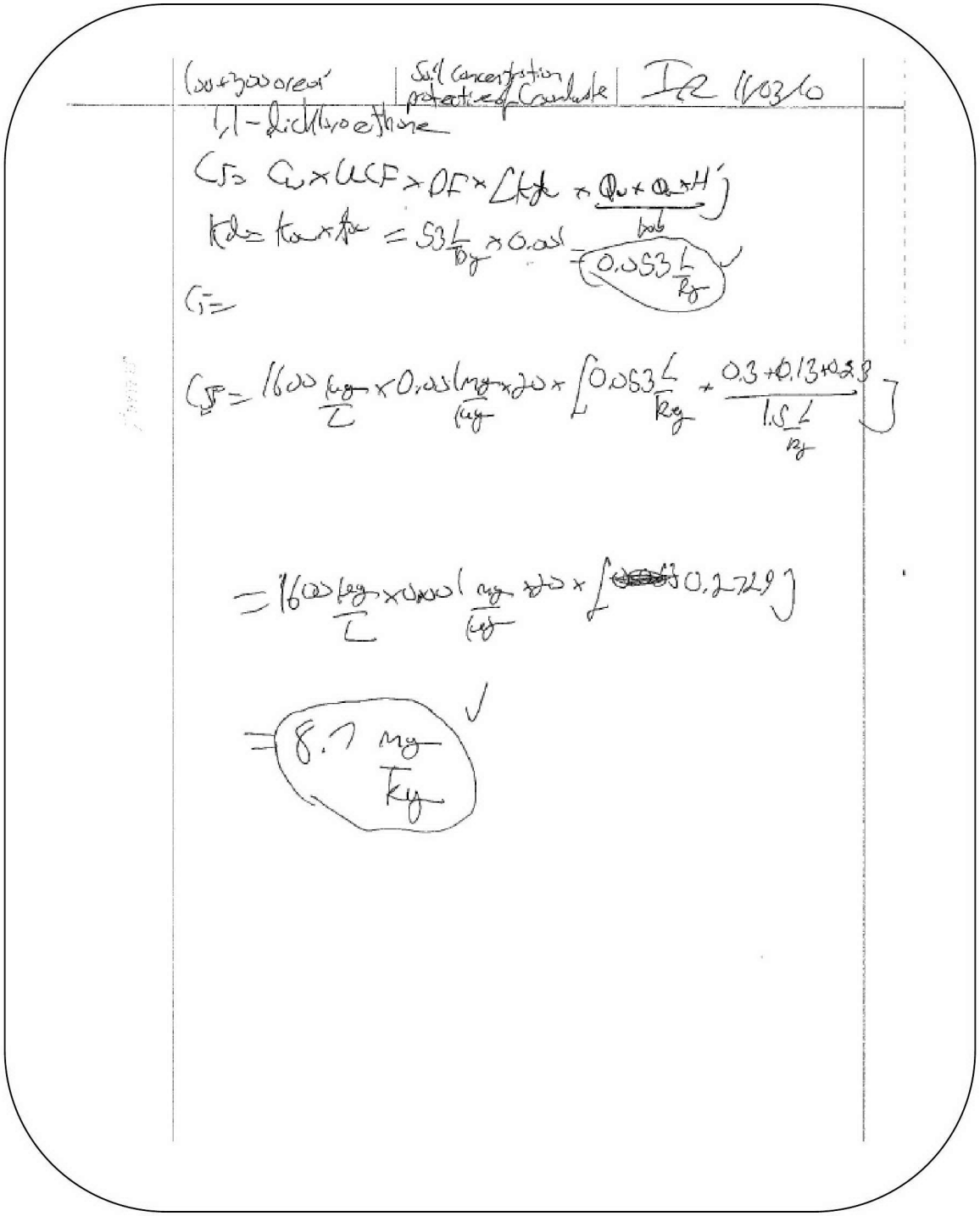
CAS #	Constituent Name	Alternate Constituent Name	Soil Concentration Protective of Groundwater (mg/kg)
78-59-1	Isophorone	isophorone	0.23
7439-92-1	Lead	lead	9.1
7439-93-2	Lithium	Lithium	32
7439-95-4	Magnesium	Magnesium (Not in CLARC database Tables)	--
7439-96-5	Manganese	manganese	50
7487-94-7	Mercury	Mercury (using mercuric chloride)	1.2
72-43-5	Methoxychlor	methoxychlor	64
75-09-2	Methylene chloride	methylene chloride	0.022
7439-98-7	Molybdenum	molybdenum	32
108-38-3	m-Xylene	Xylene, m-	14
91-20-3	Naphthalene	naphthalene	4.5
7440-02-0	Nickel	nickel soluble salts	130
14797-55-8	Nitrate	Nitrate	180
14797-65-0	Nitrite	Nitrite	13
98-95-3	Nitrobenzene	Nitrobenzene	0.10
NO3-N	Nitrogen in Nitrate	Nitrogen in Nitrate	40
NO2-N	Nitrogen in Nitrite	Nitrogen in Nitrite	4.0
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	Nitrogen in Nitrite and Nitrate	40
621-64-7	n-Nitrosodi-n-dipropylamine	nitroso-di-n-propylamine;N-	5.60E-05
86-30-6	n-Nitrosodiphenylamine	nitrosodiphenylamine;N-	0.53
95-47-6	o-Xylene	xylene,o-	15
87-86-5	Pentachlorophenol	pentachlorophenol	0.012
%MOISTURE	Percent moisture (wet sample)	Percent moisture (wet sample)	--
PH	pH Measurement	pH Measurement	--

Table 7-1. Fixed Parameter 3-Phase Partitioning Model Calculation for Soil Concentrations Protective of Groundwater

CAS #	Constituent Name	Alternate Constituent Name	Soil Concentration Protective of Groundwater (mg/kg)
85-01-8	Phenanthrene	Phenanthrene	--
108-95-2	Phenol	Phenol	11
14265-44-2	Phosphate	Phosphate	--
7723-14-0	Phosphorus	phosphorus	0.012
PO4-P	Phosphorus in phosphate	Phosphorus in phosphate	--
7440-09-7	Potassium	Potassium	--
129-00-0	Pyrene	pyrene	655
7782-49-2	Selenium	selenium and compounds	5.2
7440-21-3	Silicon	Silicon	--
7440-22-4	Silver	silver	144
7440-23-5	Sodium	Sodium	--
7440-24-6	Strontium	strontium	4,838
100-42-5	Styrene	styrene	2.2
14808-79-8	Sulfate	sulfate	1,000
18496-25-8	Sulfide	Sulfide	--
127-18-4	Tetrachloroethene	tetrachloroethylene	8.67E-04
7440-28-0	Thallium	Thallium, soluable salts	0.71
7440-31-5	Tin	tin	24,998
108-88-3	Toluene	Toluene	4.7
TPH	Total petroleum hydrocarbons	Total petroleum hydrocarbons	--
TPHDIESEL	Total petroleum hydrocarbons - diesel range	Total petroleum hydrocarbons - diesel range	--
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	Total petroleum hydrocarbons - motor oil (high boiling)	--
8001-35-2	Toxaphene	toxaphene	0.15

Table 7-1. Fixed Parameter 3-Phase Partitioning Model Calculation for Soil Concentrations Protective of Groundwater

CAS #	Constituent Name	Alternate Constituent Name	Soil Concentration Protective of Groundwater (mg/kg)
156-60-5	trans-1,2-Dichloroethylene	dichloroethylene;1,2-,trans	0.54
10061-02-6	trans-1,3-Dichloropropene	dichloropropene;1,3-,trans	0.0025
126-73-8	Tributyl phosphate	Tributyl phosphate	0.41
79-01-6	Trichloroethene	trichloroethylene (TCE)	0.0032
75-69-4	Trichloromonofluoromethane	trichlorofluoromethane	28
7440-61-1	Uranium	Uranium	1.3
7440-62-2	Vanadium	vanadium	1,600
75-01-4	Vinyl chloride	vinyl chloride [chloroethene; 1-]	3.82E-04
1330-20-7	Xylenes (total)	Xylenes (total)	15
7440-66-6	Zinc	zinc	2,899



(100+300 area | Soil Concentration protective of Groundwater | IR 11/03/10

1,1-dichloroethane

$C_S = C_w \times UCF \times DF \times [K_d + (\theta_w + \theta_a H')]$

$K_d = K_{oc} \times f_{oc} = 53 \frac{L}{kg} \times 0.001 = 0.053 \frac{L}{kg}$ ✓

$C_S =$

$C_S = 1600 \frac{kg}{L} \times 0.001 \frac{mg}{kg} \times 20 \times \left[0.053 \frac{L}{kg} + \frac{0.3 + 0.13 \times 2.8}{1.5 \frac{L}{kg}}\right]$

$= 1600 \frac{kg}{L} \times 0.001 \frac{mg}{kg} \times 20 \times [0.2729]$

$= 8.7 \frac{mg}{kg}$ ✓

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Revision 3

Groundwater Flow and Uranium Transport Modeling in Support of the 300 Area FF-5 RI/FS

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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Environmental Calculation Cover Page

Part 1: Completed by the Responsible Manager

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Checker: M Al Abody	**Basis of Qualification:** Education & experience
Senior Reviewer: WE Nichols	**Basis of Qualification:** Education & experience

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2	Update calculation to incorporate industrial recharge rate scenario and additional sensitivity cases.	01-Jun-2012	All
3	Updated by adding calculation of irrigation recharge scenario based soil screening level (SSL) for uranium using 2-D uranium model.	19-Oct-2012	Section 6.5

Part 3: Document Review & Approval:

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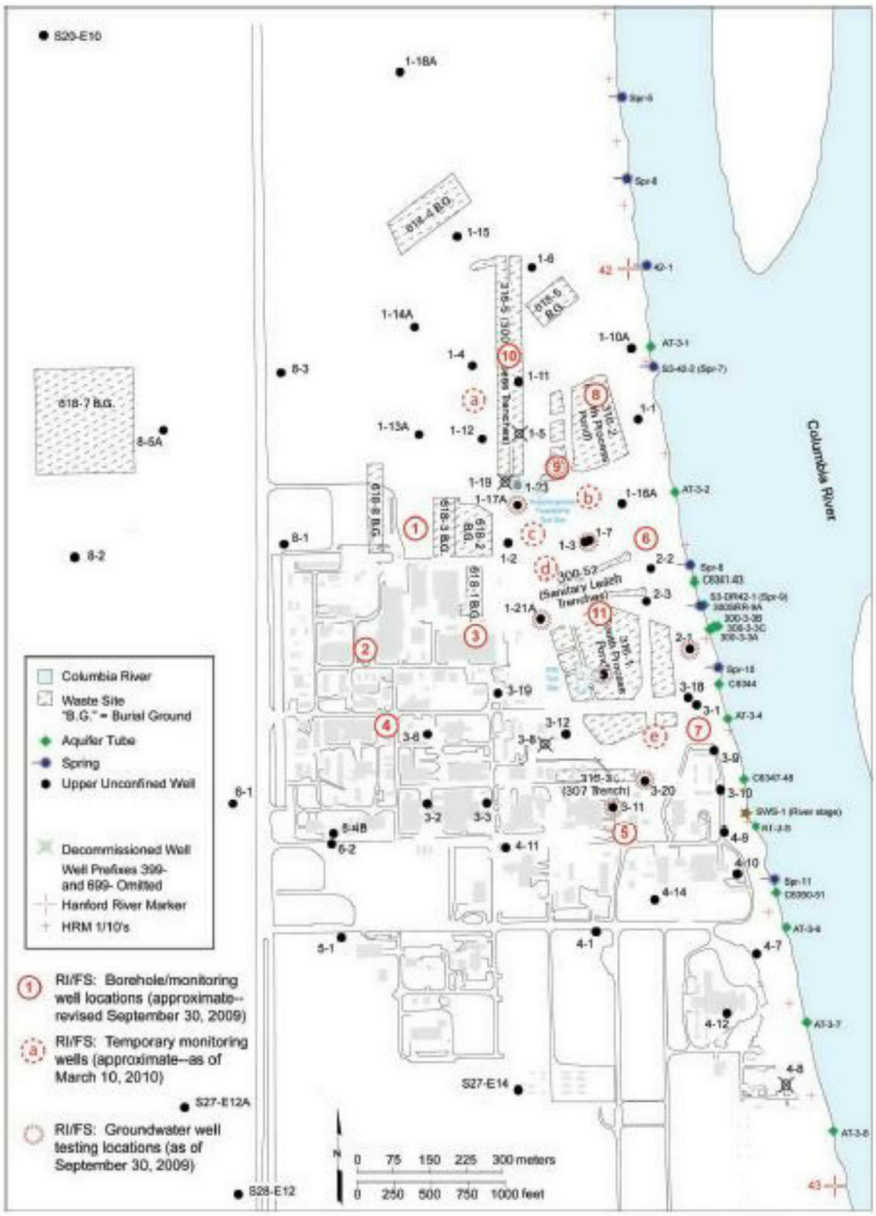
Terms

AWLN	automated water level network
CVP	contamination verification package
EC	electrical conductivity
ERA	expedited response action
FEPs	features, events, and processes
HEIS	Hanford Environmental Information System (database)
HSU	hydrostratigraphic unit
LFI	limited field investigation
MCL	maximum contaminant level
PNNL	Pacific Northwest National Laboratory
PRG	preliminary remediation goal
PRZ	periodically rewetted zone
OU	operable unit
RA	remedial alternative
RI/FS	remedial investigation/field study
STOMP	Subsurface Transport Over Multiple Phases (software)
UCL	upper confidence limit

1 Purpose

The purpose of this calculation is the simulation of the fate and transport of uranium contaminant in the vadose zone and unconfined groundwater aquifer associated with the 300-FF-5 Groundwater Operable Unit (OU) located in the 300 Area of Department of Energy's Hanford Site. A location map for 300-FF-5 OU relevant to the uranium groundwater modeling is shown in Figure 1-1. This map shows the locations of the wells discussed in this report along with their proximity to the Columbia River.



Source: Figure ES-2 from DOE/RL-2009-30

Figure 1-1. Location Map for the 300-FF-5 Operable Unit

The modeling results will be used to estimate the time at which the uranium groundwater concentrations will decrease to below the regulatory limit within the unconfined aquifer and the preliminary remediation goal (PRG) for uranium in support of the Remedial Investigation/Feasibility Study (RI/FS) document for the 300-FF-1, 300-FF-2, and 300-FF-5 OUs.

This effort includes the simulation of a no-action scenario based on current conditions and also a series of simulations which will describe the impact of proposed future remedial actions on the uranium groundwater concentrations. The objectives of the modeling effort will be to provide a basis for making informed remedial action decisions based on description of current and expected future groundwater contaminant concentrations.

2 Methodology

The approach to the groundwater fate and uranium transport modeling within the 300-FF-5 OU utilizes a mathematical hydrogeological construct to represent the physical conditions within the vadose zone and unconfined aquifer. It also involves developing a conceptual model by incorporating the important Features, Events, and Processes (FEPs) that control the uranium transport. Some of the important FEPs that are considered in the model development are discussed below:

- The seasonal fluctuations of flow in the Columbia River at the 300 Area can result in over three meters (m) of change in river stage between the high discharge period (May-June) and the low discharge period (December-January) (Figure 2-1). These seasonal fluctuations are the driving mechanism for the rise and fall of the water table beneath the 300 Area for extended periods of time and also for creating the dynamic hydraulic and geochemical environment found in the unconfined aquifer of the 300 Area. Also shown in Figure 2-1, the seasonal fluctuations in river stage also lead to remobilization of the sorbed uranium mass from the lower part of the vadose zone near 399-1-17A (Figure 1-1) due to rise in water table elevations.

- The seasonal river stage fluctuations lead to changes in the flow direction within the aquifer. Considerable variability in the flow direction also exists spatially as well within the same season. Changing flow directions can cause redistribution of uranium in the aquifer as well as in the periodically rewetted zone above the water table.

- Effect of variably-saturated conditions need to be considered in the modeling. The river stage fluctuations can temporally and spatially increase the water saturation and vary the chemical conditions that can lead to variable transport of uranium. Therefore a coupled vadose-zone and saturated-zone flow and transport needs to be considered.

- The change in groundwater chemistry (i.e., alkalinity) within the unconfined aquifer due to mixing of groundwater with river water needs to be considered in the context of adsorption/desorption of uranium.

- Due to variable flow and chemical conditions, the sorption/desorption of uranium may be kinetically limited and full equilibrium may not be established between dissolved and sorbed mass of uranium. The modeling should consider evaluating both equilibrium and non-equilibrium (kinetic) sorption.

The Pacific Northwest National Laboratory (PNNL) developed flow and transport simulator STOMP (Subsurface Transport Over Multiple Phases) (PNNL-15782, *STOMP Subsurface Transport Over*

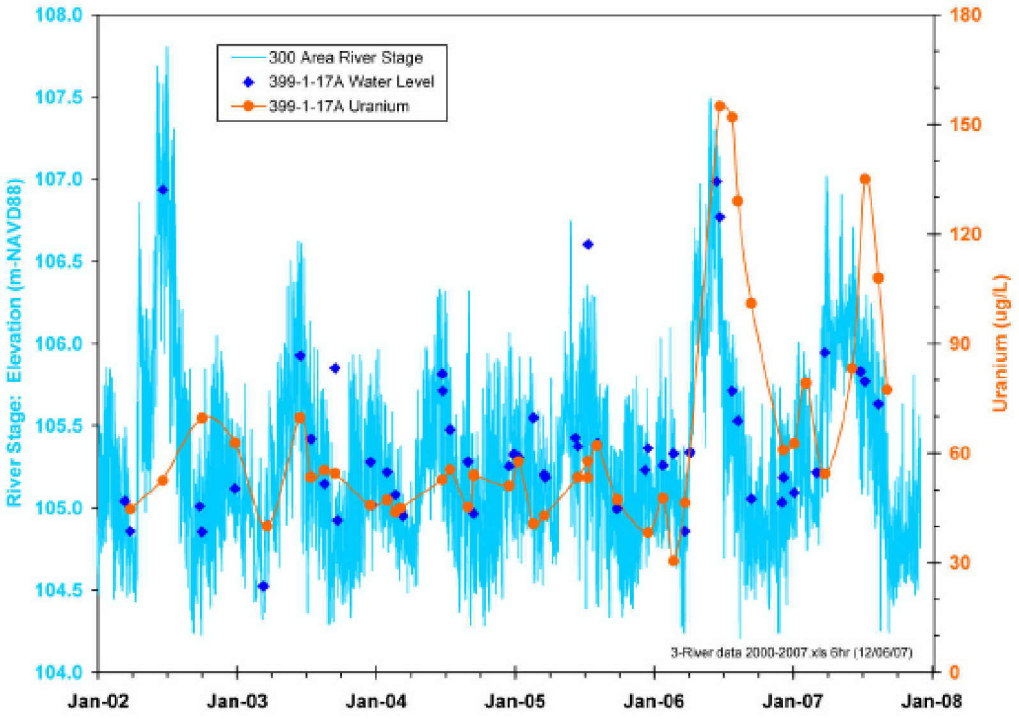


Figure 2-1. Columbia River Stage Fluctuations and Effect on Water Levels and Dissolved Uranium Concentration at Well 399-1-17A

Multiple Phases Version 4.0 User's Guide) was selected to develop the uranium transport model as the above mentioned FEPs can be incorporated in the simulator. The STOMP-W (water operational mode) and STOMP-W-R (water reactive transport operational mode) used for this calculation solve governing equations for water mass conservation and dilute species mass conservation. The reader is directed to PNNL-12030, *STOMP Subsurface Transport Over Multiple Phases Version 2.0 Theory Guide*, for a detailed presentation of the governing equations and constituent relationships.

The steps utilized in the development of the model include:

1. Construct representative two-dimensional (2-D) models for the 300-FF-5 OU using site-specific descriptions of the local physical and hydrogeologic conditions,
2. Calibrate the groundwater flow and transport model (river-tracer model) to selected measured water levels and observed groundwater/river water mixing (using electrical conductivity as a conservative tracer),
3. Conduct alkalinity mixing simulations (alkalinity approach) to capture the spatial and temporal change in water chemistry due to groundwater/river water mixing,
4. Develop an empirical relationship that defines the partition coefficient (K_d) for uranium between the aquifer material (Hanford formation) and water as a function of alkalinity, based on laboratory experiments conducted with 300 Area specific sediment samples and equivalent water chemistry,

5. Develop the non-equilibrium (kinetic) uranium desorption rate based on laboratory experiments conducted with 300 Area specific sediment samples and equivalent water chemistry,
6. Develop a three-dimensional (3-D) solid geologic model of the unconfined aquifer in the 300 Area,
7. Develop the 3-D distribution of the uranium groundwater concentrations within the 300 Area unconfined aquifer using current groundwater monitoring results,
8. Develop the 3-D distribution of uranium soil concentrations within the 300 Area subsurface using all available soil sample analysis results,
9. Develop the information and method for extrapolating uranium soil concentrations from <2-mm grain size fraction to field-textured soil (gravel correction) and for determining the labile fraction, and

Implement the gravel-corrected labile uranium distributions as initial starting conditions for the selected 2-D cross-sections modeled using STOMP. The steps utilized in the application of the model include:

1. Employ the 2-D uranium transport model to calculate the change in soil and groundwater uranium concentrations over time for the No-Action scenario and for selected remedial alternatives (RAs), and
2. Present the simulation results in meaningful graphical forms.

3 Assumptions and Inputs

This section provides all the relevant assumptions and inputs necessary to perform the calculation, including a very brief explanation of the basis for each.

3.1 Hydrostratigraphy of the 300 Area

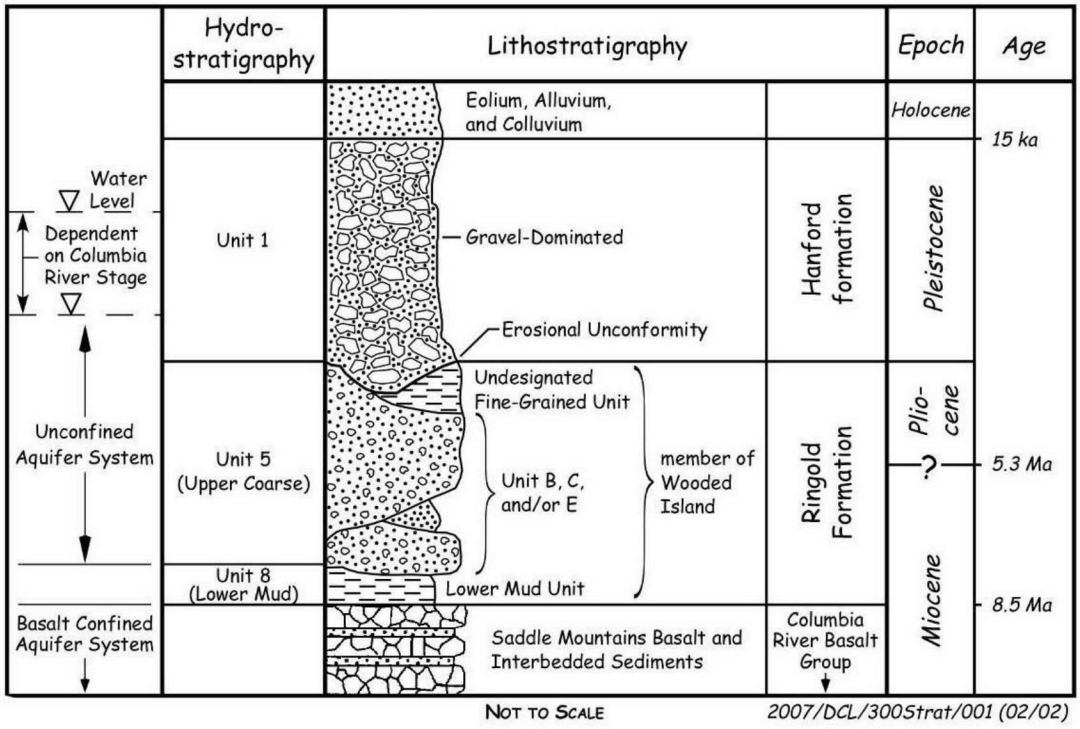
This section describes the hydrostratigraphic units within the 300 Area subsurface that are relevant to the 300-FF-5 OU shallow unconfined aquifer system. This information was summarized from the 300 Area RI/FS Work Plan (DOE/RL-2009-30, *300 Area Remedial Investigation/Feasibility Study Work Plan for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units*). Figure 3-1 provides the principle hydrostratigraphic features of 300 Area.

3.1.1 Ringold Formation: Lower Mud Unit

The Ringold Formation Lower Mud Unit is an aquitard which underlies the shallow unconfined aquifer within the 300-FF-5 OU. This unit is comprised of silty clay to silty sand sediments. The Lower Mud unit has very low permeability and separates the shallow unconfined aquifer from the underlying Columbia River Basalt Group.

3.1.2 Ringold Formation: Coarse Gravel

In the FF-5 OU, the coarse gravel lithofacies of Ringold Formation overlies the Lower Mud Unit. This section is comprised of gravel to silty/sand gravel fluvial sediments. The permeability of this gravel dominated unit is less than the overlying Hanford formation gravel deposits due to a greater percentage of silts and clay, and a greater degree of consolidation.



Source: Figure 2-17 from DOE/RL-2009-30

Figure 3-1. Hydrostratigraphic Column for the 300 Area

3.1.3 Ringold Formation: Undesignated Finer-Grained Interval

In the 300 Area, a finer-grained interval of sediment is located intermittently within the upper portion of the Ringold Formation at the contact with the overlying Hanford formation. This lithofacies is comprised of sediments ranging in grain size from silt to coarse-grained sand. Where present, this facies acts as a barrier to vertical flow and contaminant migration.

3.1.4 Hanford Formation

The Hanford formation overlies the Ringold Formation and is comprised of mainly pebble to boulder sized gravel with a matrix of poorly sorted fine to coarse grained sand and silt. Within the 300 Area, the water table is located within the Hanford formation. The hydraulic conductivity of the Hanford can be over several orders of magnitude greater than the Ringold Formation.

3.1.5 Surface Deposits

Overlying the Hanford formation is 1 to 6 m of eolian silt, rework sandy gravels from the Hanford formation, or surface fill from site operations. Three surface soil types have been identified within the 300 Area. These are the Ephrata Sandy Loam, Burbank Sandy Loam and Rupert Sand (PNNL-14702 Rev. 1, *Vadose Zone Hydrogeology Data Package for Hanford Assessments*). Prior to recent demolition actions conducted within the 300 Area, a large portion of the 300 Area was covered by industrial operations (buildings, foundations, roads, etc…) thereby limiting the areal coverage for recharge.

3.1.6 Solid Model

Leapfrog Hydro™[1] V1.3 (ARANZ Geo Limited, 2010) software was used to create a 3-D solid hydrogeologic model within the 300 Area (Figure 3-2). Hydrostratigraphic data was compiled for the 300 Area from two main sources: the hydrostratigraphic unit (HSU) database maintained by Freestone Environmental (version updated 12/15/2009, ECF 200BP5-10-00344, Rev 0) and Table 4.1 of PNNL-17034, *Uranium Contamination in the Subsurface beneath the 300 Area, Hanford Site, Washington*. Additional borehole log data, in draft form, were provided for the following new RI wells: 399-1-55, 399-1-56, 399-1-57, 399-1-58, and 300-2-32. The HSUs detailed in the 3-D model include the following designations: Hanford, Ringold Fine Grained, and Ringold E. Leapfrog Hydro™ uses radial basis functions to interpolate contact surfaces between units based on the HSU data. The units between contact surfaces are then assigned a user-specified HSU to create the 3-D layered model. Cross-sections were extracted from the 3-D model and used to produce the 2-D STOMP flow and transport model grids. The 2-D grids were truncated vertically above the mud to reduce the number of nodes in the model. This was justified since contamination was not observed in the lower parts of Ringold E and flow within the unconfined aquifer is predominantly in the Hanford formation.

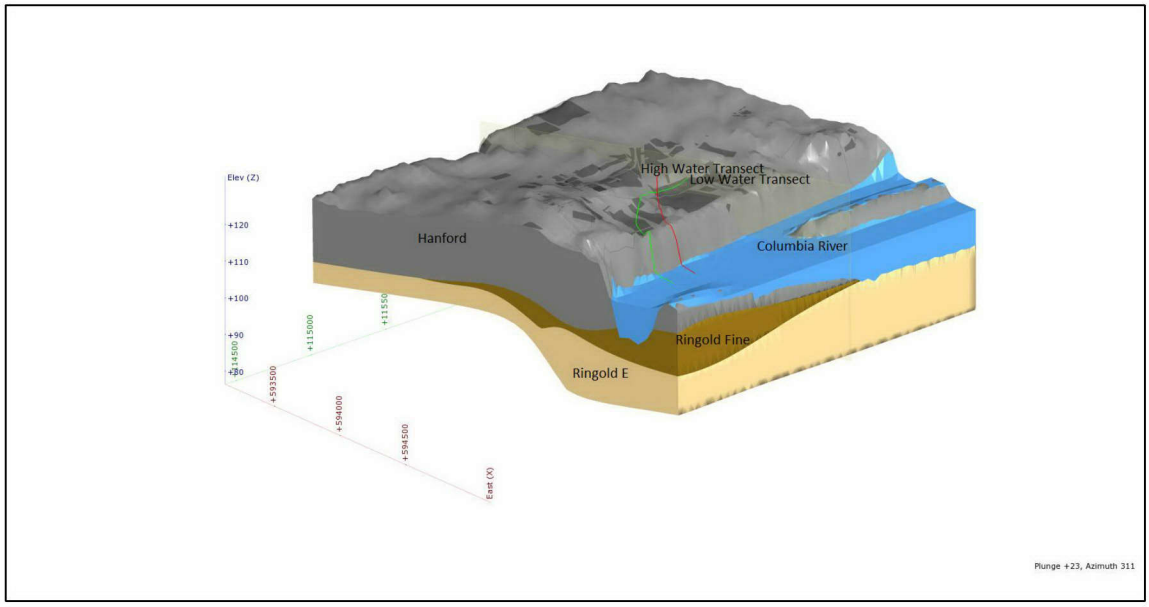


Figure 3-2. 300 Area Solid Model Developed using Leapfrog Hydro™

3.2 Development of 2-D Model Domain

The seasonal river stage fluctuations lead to changes in the flow direction within the aquifer. Considerable variability in the flow direction also exists spatially as well within the same season. To evaluate the changes in flow direction water table maps were created for each month of year 2009. The water level elevations for the wells were taken from HEIS by selecting a specific date for each month when data from maximum number of wells were available. Limiting the dataset to a specific date of measurement reduces the temporal variability that is introduced by the short-term (hourly) variable discharge through the Columbia River. The water table maps were generated by interpolation using the ordinary kriging

[1] Leapfrog Hydro is a trademark of ARANZ Geo Limited, Christchurch, New Zealand.

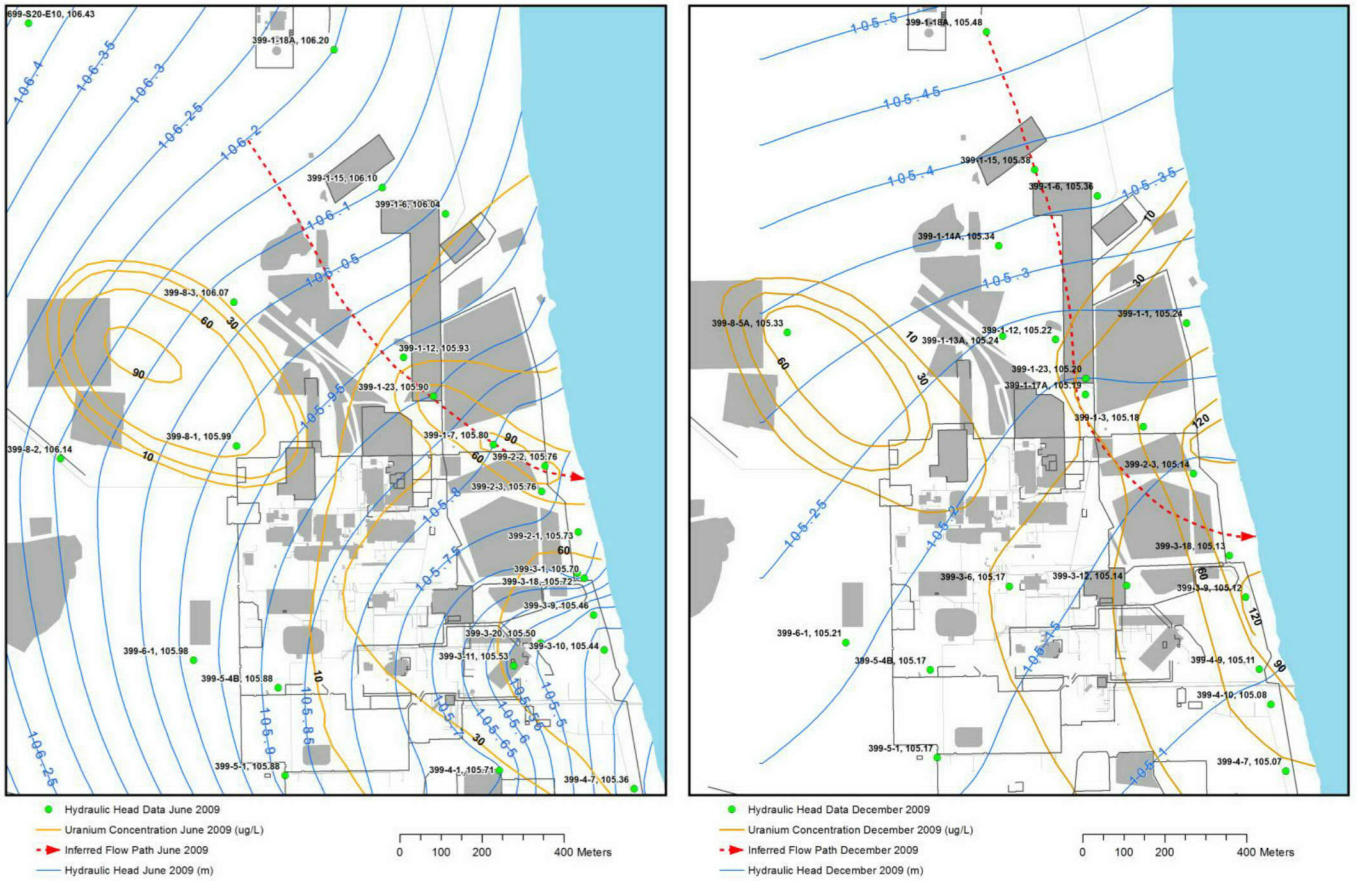
geostatistical technique. The results for the month of June 2009 (high water table) and December 2009 (low water table) are shown in Figure 3-3 along with dissolved uranium concentration in groundwater. An inferred flow path is shown for both months for flow south of the Process Trench (316-5 waste site), the area that is known to have high sorbed uranium concentration in the vadose zone and a potentially big contributor of uranium mass to the groundwater. The comparison of flow paths among the two months indicate that the flow direction is northwest-southeast in June 2009 (high water table) and changes to more southerly direction in December 2009 (low water table). The flow paths in other months fall between the two flow directions but seem to be closer to the June 2009 flow path. The variability in flow direction can result in the extent of mixing of river water and groundwater, which influences the alkalinity variation in the aquifer and thereby the uranium mobility (based on K_d).

To evaluate the influence of mixing of river water and groundwater under seasonally variable flow directions, 2-D cross-sectional modeling was performed separately along predominant flow path for June and December. These two months encompass the range in flow path variation and thus evaluating the effect of mixing among these flow paths can lead to understanding of uranium transport over time.

Two transects were chosen to represent cross section models of the 300-FF-5 OU. The June-North transect was determined from the evaluation of high water levels and uranium groundwater concentrations in June 2009 (Figure 3-3a and Figure 3-3c). This transect was designed such that it followed a flow path that intersected the highest concentrations of the uranium groundwater concentration plume. Laterally the flow model domain extends from the vicinity of well 399-1-13A curving southeast towards the Columbia River. The transect skirts the southern sides of the Process Trenches and North Process Pond before ending beneath the Columbia River.

The December-North transect represented low water level conditions observed during the fall and winter months and was determined based on water levels and groundwater uranium concentrations in December 2009 (Figure 3-3b and Figure 3-3c). This transect extended from the vicinity of well 399-1-4 heading mostly southward through the Process trench. It intersects the June-North transect before curving eastward toward the river where it continues through the South Process trench before terminating beneath the Columbia River.

The model domain and finite-difference grid chosen for both transects is shown in Figure 3-4 and Figure 3-5. Vertically both models extended from ground surface into the Ringold Unit E or fine grained formations. The vertical grid spacing was chosen to be 0.5 m. Horizontally, the grid spacing varied from 1.0 to 5.0 m. A horizontal grid spacing of 1.0 m was assigned in the vicinity of the river boundary to provide better resolution in describing the river alluvium adjacent to the river. A grid spacing of 2.0 m was assigned in the vicinity of the high soil uranium concentrations near the southern end of the Process Trench. Elsewhere the grid spacing was 5.0 m with the grid spacing transitioning between the smaller and larger cells by increasing cell size by no more than 1.5 times the adjacent cell size. A maximum grid spacing (Δx) of 5.0 m spacing was determined based on the Peclet number ($Pe = \Delta x/\alpha_L$) with a maximum Peclet number of 10 and a dispersivity of 0.5 m (William et al., 2008). Ultimately the maximum Peclet number was less than 1.0 based on the calibrated longitudinal dispersivity of 8.75 m.



(a) (b)

Figure 3-3. Plan-view Maps Showing the Water-level Contours (blue lines), the Dissolved Uranium Groundwater Concentrations (orange lines) and the Inferred Flow Paths for (a) June 2009 and (b) December 2009, and (c) Displays Final Modeled Transects Relative to Well Locations

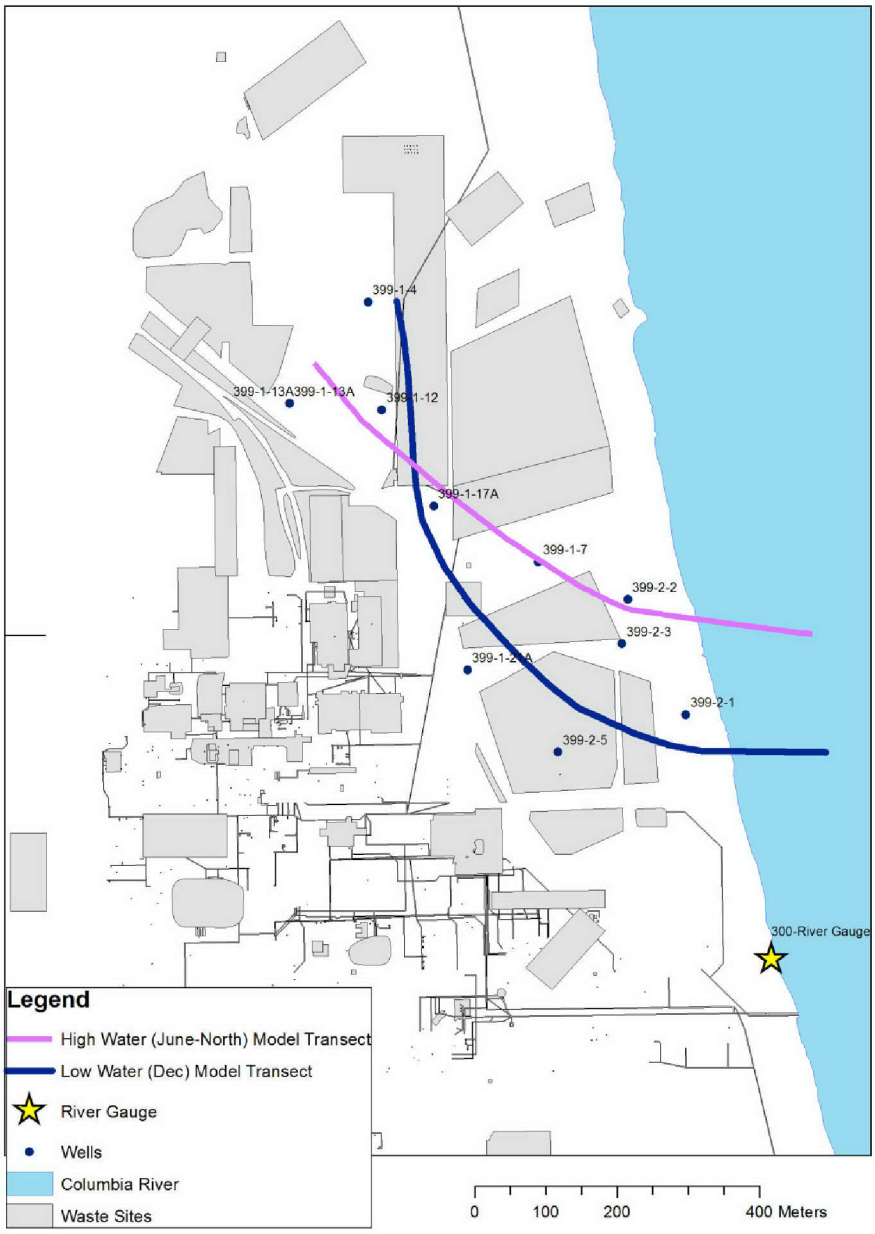


Figure 3-3 (continued). Plan-view Maps Showing the Water-level Contours (blue lines), the Dissolved Uranium Groundwater Concentrations (orange lines) and the Inferred Flow Paths for (a) June 2009 and (b) December 2009, and (c) Displays Final Modeled Transects Relative to Well Locations

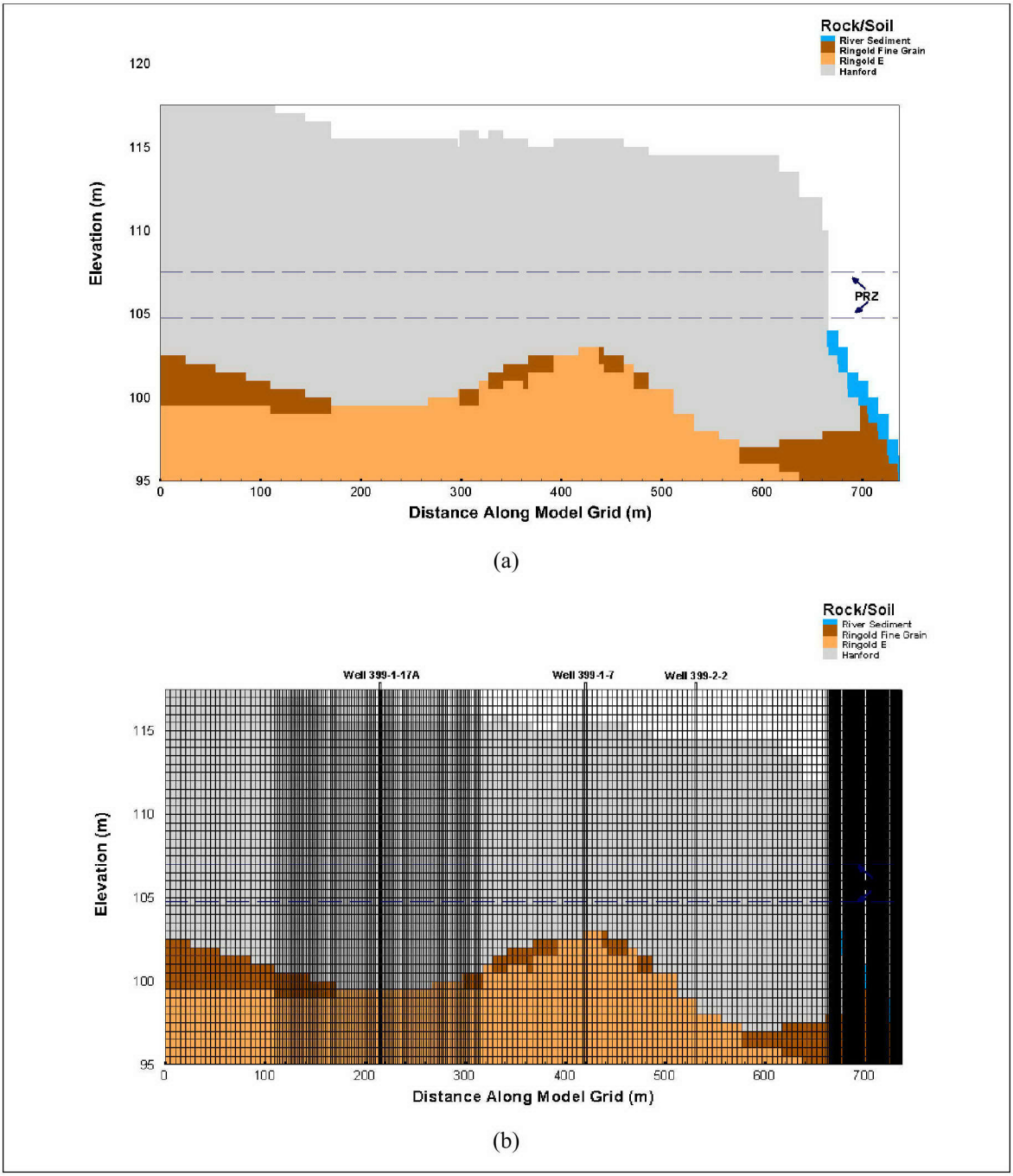


Figure 3-4. Model Domain for the June-North (high water) Transect showing the (a) Assigned Hydrostratigraphy and (b) Overlain with the Model Grid

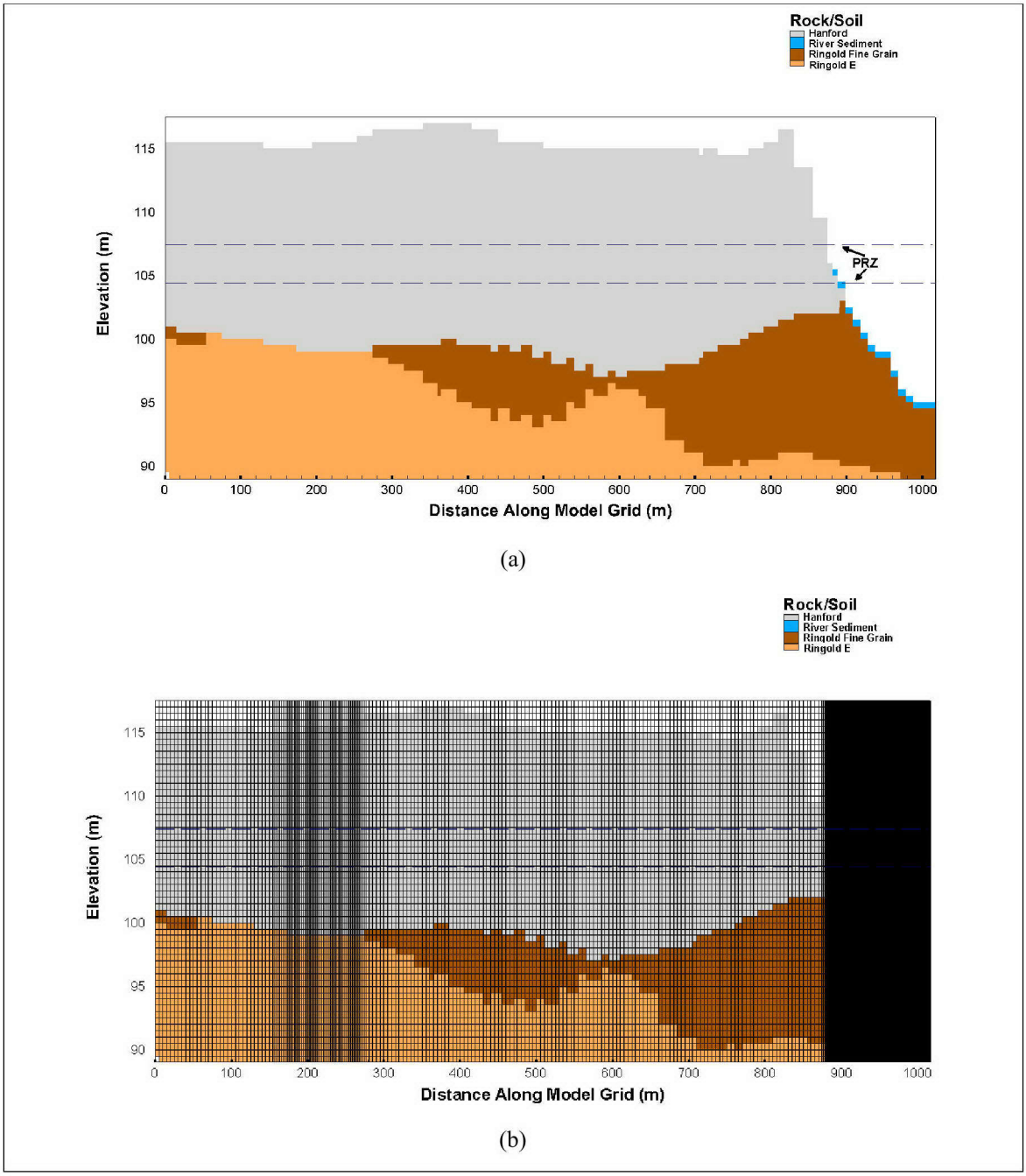


Figure 3-5. Model Domain for the December-North (low water) Transect showing the (a) Assigned Hydrostratigraphy and (b) Overlain with the Model Grid

3.3 Processes Simulated and Limitations

The 300-FF-5 OU groundwater flow and uranium transport model simulates the following processes:

- Variably saturated flow
- Transient hydraulic boundary conditions
- Advective transport
- Dispersive transport
- Diffusive transport
- Sorption of uranium

Separate transport models were developed to address the sensitivity of uranium transport to equilibrium and kinetic (non-equilibrium) sorption models.

Fluid density variations due to fluid chemistry, contaminant concentrations, or temperature variations are assumed to be negligible.

The limitations to the calculation follow from the governing equations, boundary conditions, initial conditions, parameter values, and discretization employed in the model development. The calculation results are dependent on the current understanding of these components. Hence, discovery of new data regarding these components may cause the models and their results to change. For example, new data about the lithology and hydraulic properties of an area of concern could require changes to the grid discretization, hydraulic property distribution, and initial condition. An additional limitation results from the usage of a 2-D model to simulate the groundwater flow and transport in a 3-D system. The selection of the 2-D transect location for the model limits the utility of the modeling results to the locale represented by this transect. The extrapolation of the calculation results to other areas within the 300 Area will be uncertain given the differences in flow direction and uranium source term.

3.4 Groundwater Flow

3.4.1 Boundary Conditions

3.4.1.1 Top Boundary (Recharge)

For the calibrated model, the recharge rate applied at the top boundary was a constant, Neumann type (specified flux) boundary condition based on the analysis reported in PNL-10285, *Estimated Recharge Rates at the Hanford Site,* of lysimeter drainage measured at the South Caisson located in the Buried Waste Test Facility of the 300 North Area during the period from July 1985 to June 1993. Over the eight-year period of record, the recharge ranged from 24 to 111 mm/yr with an average of 55.4 mm/yr. Drainage data from the lysimeter reflects a non-vegetated cover and medium to coarse sand. The recharge boundary condition in the model was specified as a Neumann (specified flux) boundary condition with a flux rate of 55.4 mm/yr.

For forward (predictive) modeling, the recharge rate transitions in time towards a native shrub steppe vegetation cover with reduced recharge so a transient, Neumann type (specified flux) boundary condition was applied. From the present, the recharge changes from the current 55.4 mm/yr used in the model calibration to 6 mm/yr after six years (representing a young shrub steppe vegetative cover), and then to 3 mm/yr after thirty years (representing a mature shrub steppe vegetative cover). The transition time is consistent with that identified in DOE/RL-2011-50, *Regulatory Basis and Implementation of a Graded*

Approach to Evaluation of Groundwater Protection. This recharge change is termed the native vegetation recharge scenario and would be appropriate for PRG development for waste sites outside of industrial use.

For waste sites in industrial use areas, an industrial recharge scenario was developed with regulator agreement to evaluate representative conditions for land surface that remains in a permanently disturbed condition as a consequence of industrial land use. In this scenario, recharge begins with a steady state of 50 mm/yr and continues at this rate for five years. This rate is similar to that measured rate of 51 mm/yr for an area covered with gravelly sand at the Hanford Solid Waste Landfill and is based on data collected over a 22-year period with less than 5 percent vegetation cover (DOE/RL-2011-50, Table 4-7). Next, the rate transitions linearly from 50 mm/yr to 25 mm/yr over a period of 5 years, representing the establishment of a cheatgrass community. Thereafter, the surface is assumed to remain in a permanently disturbed state with the cheatgrass community unchanged. The 25 mm/yr rate for cheat grass is similar to the measured rate of 25.4 mm/yr at the "Grass Site" in the 300 Area covered with coarse-grained soil and cheat grass (DOE/RL-2011-50, Table 4-7).

To support the calculation of the SSL for uranium, the irrigation recharge scenario used for other COPC PRGs was adopted. In this scenario, recharge begins with a steady state of 55.4 mm/yr and continues at this rate for six years. The rate then transitions as a step function to 74.4 mm/yr after six years representing introduction of irrigation as an additional rate above the native vegetation recharge scenario rate (see ECF-300FF5-11-0153), and after 30 years decreases to 71.4 mm/yr (again, evaluated as an irrigation addition to the native vegetation rate), where it remains thereafter.

3.4.1.2 River Side Lateral Boundary (River Stage)

Columbia River stage is a major driver in the hydrologic system in the 300 Area and measured river stage was applied as a transient Dirichlet type (specified head) boundary condition for the river side lateral boundary of the 2-D model. Changes in Columbia River stage reflect the release of water upstream at the Priest Rapids Dam to meet electric power demand. The seasonal cycle in river stage is related to the timing and volume of snowpack and snowmelt in the watershed with lower river stages typically occurring during fall and winter. The average range of diurnal fluctuations is ~0.5 m. Within 1,000 m of the river, this diurnal river fluctuation is larger than the average piezometric head drop of approximately 0.2 m, resulting in twice daily groundwater flow reversals (Yabusaki et. al., 2008). Weekly, daily, and sub-daily cycles are also evident from the river stage data.

Hourly Columbia River stage data from the river stage recorder in the 300 Area (SWS-1) were used to set a time-varying hydrostatic pressure at the river boundary. The SWS-1 gage is located on the west bank of the Columbia River slightly south of the transect lines (indicated by yellow star labeled "300-River Gauge" in Figure 3-3c). The river stage data was collected manually beginning in 1991 at approximately monthly intervals until collection of automated hourly measurements began in January 2004. The river stage data were implemented in the model by averaging the hourly data over a daily cycle for the period starting from January 1, 2008 through December 31, 2009 (2008-2009) (Figure 3-6). Over this time period, the minimum and maximum river stage was 104.3 m and 107.6 m, respectively. The median stage over this time period was 105.1 m. During initial model development, simulations were run with hourly, daily, and monthly boundary condition intervals. Monthly-averaged boundary conditions were shown to produce too much error in terms of simulated heads when compared to heads at groundwater monitoring wells. The daily-averaged boundary conditions resulted in insignificant error such that all further simulations were carried out with daily boundary condition intervals as opposed to hourly boundary conditions that resulted in much longer run times.

3.4.1.3 Inland Lateral Boundary (Automated Water Level Network Hydraulic Heads)

Hourly water-level measurements from the automated water level network (AWLN) were used to assign a transient, Dirichlet type (specified head) boundary conditions to the inland lateral boundary of the model grid. There are 27 AWLN gages in the 300 Area, some of which were used for model evaluation. Most of the AWLN gages in the 300 Area began recording in January of 2008 which resulted in the decision to select the 2008-2009 time period as the representative model period.

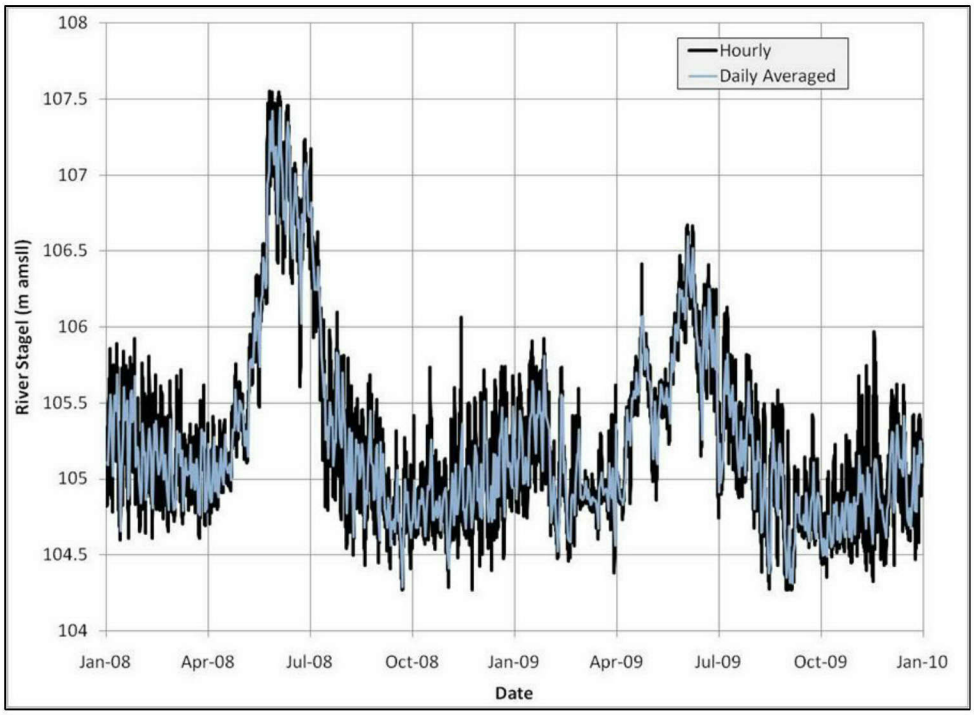


Figure 3-6. Comparison of the Hourly and the Daily Averaged River Stage Data for the Columbia River at the 300 Area

The water level data at AWLN gage 399-1-13A, the well located closest to the inland end of the June-North 2-D model grid (Figure 3-3c), was used to set time-varying hydrostatic pressures at that boundary (Figure 3-7). The inland boundary condition for the December-North model grid was based on a combination of water level data from nearby wells (399-1-4, 399-1-12, and 399-1-4) as shown in Figure 3-3c. This is because the closest well 399-1-4 is not part of the AWLN and therefore daily water level dataset was not available. During the months of February through October (representing relatively high water table) daily boundary conditions from well 399-1-13A were used. During the months of November through January (representing low water table) the water levels from downgradient well 399-1-12 modified by a constant offset of +0.12 m. This trend correction was necessary because well 399-1-4 was not a part of the AWLN and upgradient of 399-1-12, so a trend correction was derived by comparing the trends between the measured water levels for 399-1-4 and 399-1-12 and calculating the average offset. The final modified water level time series along with the contributing time series are shown in Figure 3-8. This method resulted in better water level and tracer concentration matches when compared to using only one set of data from any single well.

The hourly water levels for both models were averaged over a daily time-step for the 2008-2009 period as was done for the river stage data. As with the river stage data, the model was run with hourly, daily, and monthly boundary condition intervals with daily boundary conditions considered the best option. Results using daily averages indicate that, at the location of well 399-1-17A in the June-North (high-water) model, the difference in simulated water levels using hourly and daily boundary condition specifications was minimal relative to the vertical model discretization, on the order of 2 to 6 cm. Daily boundary conditions were found to adequately capture the transient nature of the data without prohibitively long simulation run times.

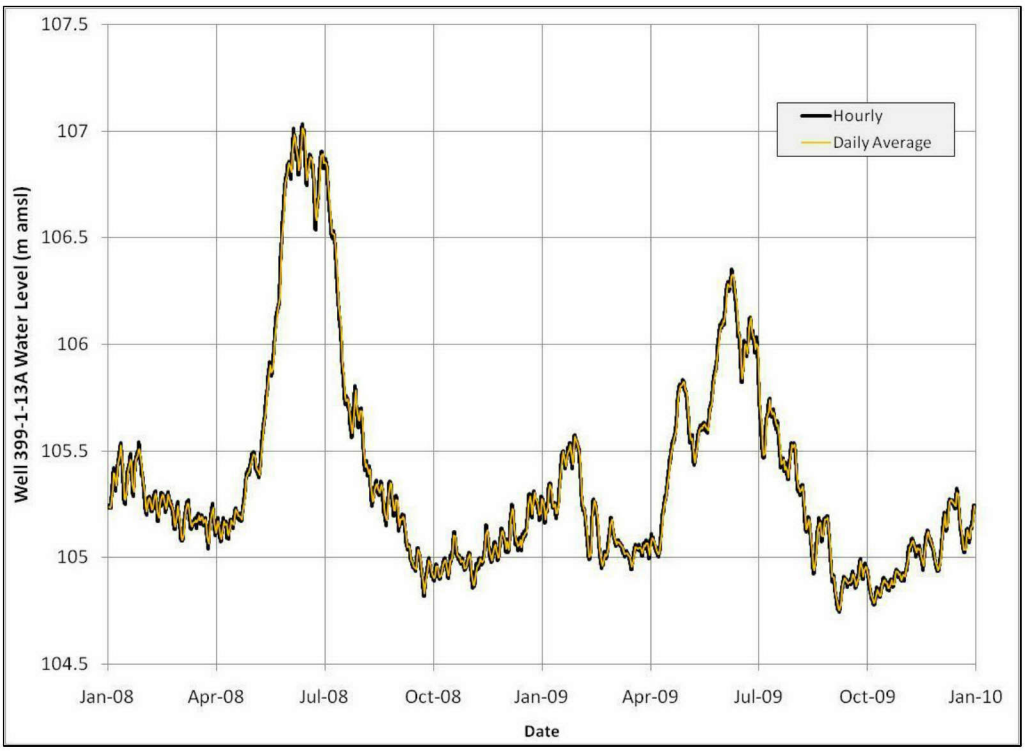


Figure 3-7. Comparison of the Hourly and the Daily Averaged Water Level Data for Well 399-1-13A

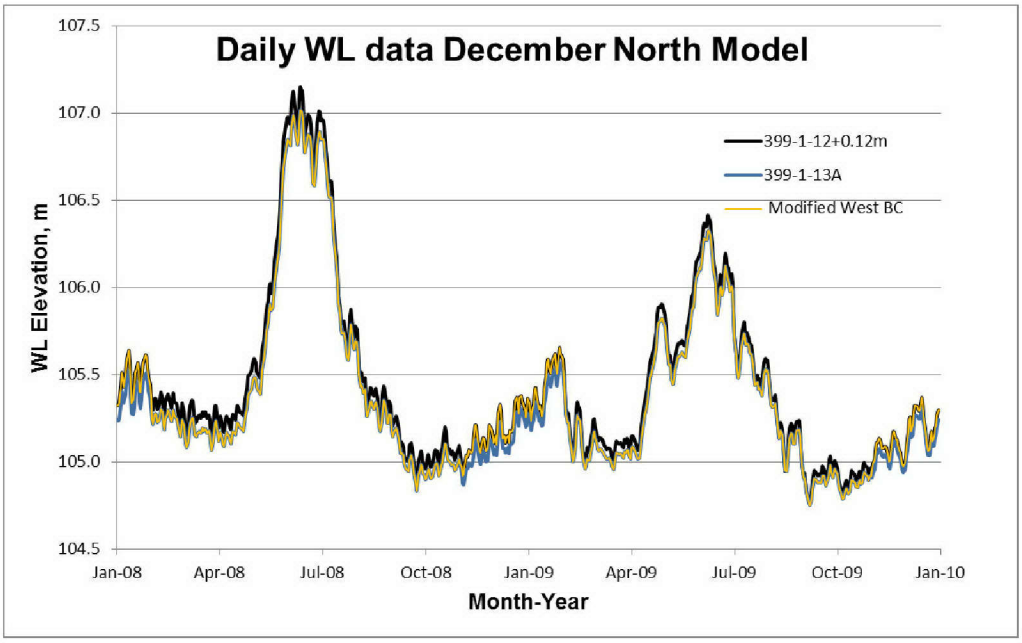


Figure 3-8. Water Level Data at Well 399-1-12 and Modification for the December-North Model Inland Boundary Conditions

Over the 2008-2009 simulation time period the minimum and maximum water levels at 399-1-13A were 104.8 m and 107.0 m, respectively. The median water level over this period was 105.2 m. The period of sustained high water levels generally occurs during the months of May through August.

3.4.2 Simulation Periods

Simulations were initially conducted over the two-year period from January 1, 2008 through December 31, 2009. This period coincides with complete water level data sets available for the inland and river model boundaries from well 399-1-13A and the river gage, respectively. Additional wells along or close to the cross section also had complete or nearly complete data sets for the same 2 year period that were useful in the calibration process. Of the years 2008 and 2009, 2008 exhibits the highest river stage and corresponding aquifer water levels while the maximum river stage and aquifer water levels measured in 2009 are lower. High water levels are thought largely responsible for the interaction of groundwater with labile uranium soil concentrations towards the top of the periodically rewetted zone (PRZ). This in turn is surmised to be responsible for generating periodic pulses to the uranium groundwater plumes with concentrations exceeding 90 µg/L. The high river stage during summer of 2009 is lower than that observed in 2008 such that groundwater does not intersect soils near the top of the PRZ containing higher soil uranium concentrations. Thus the use of data from the period 2008-2009 provides a sampling of different flow behaviors and resulting uranium transport in the aquifer.

3.4.3 Initial Hydraulic Head Distribution

The two-year simulation lateral boundary conditions (Section 3.4.1.2 and 3.4.1.3) were applied cyclically for the three different models developed: the river-tracer model, the alkalinity model, and the uranium transport model.

The process of setting a coherent initial hydraulic head distribution in the model domain requires starting from an approximate initial condition and then running the model for a sufficient number of cycles of the

river boundary condition to equilibrate the hydraulic heads. Equilibrium in this case is measured by comparing hydraulic head at the same time in the cycle between cycles; when the difference between cycles for a given node and point in the cycle is essentially nil, the initial condition is considered coherent.

For the river-tracer model, initial hydraulic conditions were established by setting boundary hydraulic heads based on observed data at the inland lateral and river side lateral model boundaries based on a vertical hydrostatic head distribution as the approximate initial condition. The river-tracer model was run for five cycles (10 years) in order to iterate to a coherent initial head condition for subsequent forward (predictive) model simulations. Hydraulic heads in the model rapidly equilibrated (achieved coherence) within the first two cycles.

Based on the rapid equilibration of the flow system in the river-tracer model, the alkalinity model was run for two cycles (four years) using the final head distribution from the 10 year river-tracer model as the approximate initial hydraulic condition. Running the alkalinity model for two cycles (four years) achieved equilibration of the initial alkalinity distribution.

The uranium transport model also used the final hydraulic solution from the 10 year river-tracer model as the initial (coherent) hydraulic condition. In order to extend the uranium transport model run time, the two-year simulation cycle was repeated for 100 cycles for a total of 200 years.

Initial hydraulic conditions for the start of a new two-year model cycle were taken from the final 'restart' file of the previous two-year cycle. The 'restart' file was accessed by STOMP using the ***Restart*** option in the Solution Control Card of the STOMP 'input' file (PNNL-15782).

3.4.4 Hydraulic Parameters

Four different material property zones were characterized for the hydrologic system: (1) Hanford formation gravel and sand, (2) Ringold Unit E gravel and sand, (3) undesignated fine grained subunit of the Ringold Formation consisting of gravel, sand, and silt, and (4) river alluvium representing the hyporheic zone of the Columbia River. The Hanford formation gravel and sand zone was further divided into saturated and vadose zones for purposes of assigning different dispersivities (the need for this is explained in Section 3.5.1.1). Groundwater flow parameters used in the model include:

- Hydraulic conductivity
- Porosity
- Particle density
- Saturation-pressure and relative permeability relationships
- Specific storativity

3.4.4.1 Hydraulic Conductivity

The hydraulic conductivity of the Hanford formation has been reported to be difficult to determine from aquifer testing due to its highly transmissive nature. Constant rate aquifer tests conducted at wells screened in the Hanford formation within the 300 Area resulted in values of horizontal hydraulic conductivity ranging from approximately 980 m/d to 15,000 m/d (WHC-SD-EN-TI-052, *Phase 1 Hydrogeologic Summary of the 300-FF-5 Operable Unit, 300 Area*). Re-evaluation of these tests (William et al., 2008) identified recharge boundary effects in some cases leading to unreliable results. Aquifer test results with hydraulic conductivities >5,000 m/d were considered uncertain due to the low drawdown obtained during the tests (<0.1 m) making accurate analysis difficult. Horizontal hydraulic

conductivity of the Hanford formation are reported for previous 2-D and 3-D numerical modeling studies: 2,000 to 10,000 m/d (PNNL-17708, *Three Dimensional Groundwater Models of the 300 Area at the Hanford Site, Washington State*), 1,500 m/d (Yabusaki et al, 2008), and 7,000 m/d (Ma et al., 2010). Hydraulic conductivity for the Hanford formation was adjusted as part of the model calibration.

In previous 2-D and 3-D numerical modeling studies the assigned Ringold E hydraulic conductivity value ranges from 15 m/d (Yabusaki et al., 2008) to 40 m/d (PNNL-17708 and Ma et al., 2010). Hydraulic testing of the Ringold formation gave reliable horizontal hydraulic conductivity estimates of between 2 and 51 m/d (PNNL-17708). Of these estimates, horizontal hydraulic conductivity of 42 m/d was reported in WHC-SD-EN-TI-052 for pumping tests conducted at well 399-1-16A while an averaged result of 43.25 m/d was reported by Swanson (1992) for pumping tests conducted further from the current study but within the 300 Area (see PNNL-17708). A horizontal hydraulic conductivity of 42 m/d, based on the pumping tests conducted at well 399-1-16A, was assigned to the Ringold E and was not adjusted during model calibration.

The Ringold fine grained unit was previously simulated with an assigned hydraulic conductivity between 1 m/d (PNNL-17708; Ma et al., 2010) and 1.5 m/d (Yabusaki et al., 2008). Previously 3-D modeling assigned a horizontal hydraulic conductivity of 1 m/d to the Ringold fine grained unit (PNNL-16435, *Limited Field Investigation Report for Uranium Contamination in the 300 Area, 300FF5 Operable Unit, Hanford Site*). The Ringold fine grained was assigned a hydraulic conductivity of 1 m/d and was not adjusted during model calibration.

The vertical hydraulic conductivity of the Hanford and Ringold formations were set to 0.01 times the horizontal conductivity which is consistent with previous groundwater modeling studies that assume the vertical hydraulic conductivity of the Hanford and Ringold range from 0.01 to 0.1 times the horizontal conductivity (PNNL-16396, *Combined Estimation of Hydrogeologic Conceptual Model, Parameter, and Scenario Uncertainty with Application to Uranium Transport at the Hanford Site 300 Area*; PNNL-17708; Yabusaki et al., 2008).

The hydraulic conductivity of alluvium in the hyporheic zone of the Columbia River adjacent to the 300 Area has been estimated between 0.63 and 103.68 m/d (Fritz and Arntzen, 2007) based on slug tests conducted in nine piezometers with depths to top of screen ranging from 19 to 180 cm. Hydraulic conductivities were shown to be smaller near the water-sediment interface and increasing exponentially with depth. An effective vertical hydraulic conductivity was determined for three of the piezometers and ranged from 0.37 to 7.0 m/d. Based on the hyporheic zone study, the thickness of the river alluvium was modeled at 1 m in the June-North model and 0.5 m in the December-North model. The previous study that explicitly simulated river sediments, the PNNL-17708 study, used an isotropic conductivity. Following that study, the hydraulic conductivity of the river alluvium was simulated as isotropic in this model as well. Hydraulic conductivity of the river alluvium was adjusted as part of model calibration.

3.4.4.2 Porosity

In the STOMP multiple-porosity formulation, total porosity (n_T) refers to both isolated and connected pore space while diffusive porosity (n_D) refers to the connected pore space and is the porosity through which flow and transport occurs. The diffusive porosity was assumed equal to total porosity in this model because data were insufficient to distinguish between these porosities. This expedient assumption is conservative with regard to peak concentration because if $n_T > n_D$ then there is potential for some contaminant mass to migrate into isolated pore space, thereby reducing peak arrival concentration. Total and diffusive porosity was specified as 0.177 cm^3/cm^3 for the Ringold Formation units and the river alluvium (PNNL-14702 Rev. 1, Table 4.5, Soil Class Rg). Porosity for the Hanford formation was specified as 0.167 cm^3/cm^3 (PNNL-14702 Rev. 1, Table 4.5, Soil Class Hg).

3.4.4.3 Particle Density

The bulk density for the Hanford formation was taken as 2.23 g/cm^3 and reflects the modal value of measurements for sandy gravel at the 300 Area (PNNL-17708, Table A.3). A bulk density of 2.23 g/cm^3 is also reasonable given the range of bulk densities for Hanford coarse gravel of 1.56 to 2.42 g/cm^3 for a gravel content ranging from 50% to 85% respectively (PNNL-14702 Rev. 1, Table B-21). The particle density for the Hanford formation was 2.68 g/cm^3 based on a porosity of 0.167 cm^3/cm^3 and a bulk density of 2.23 g/cm^3.

A particle density of 2.63 g/cm^3 and 2.66 g/cm^3 was reported (William et al. 2008, Appendix A) for the Ringold E and fine grained formations for the 300 Area with an average value of 2.65 g/cm^3 assigned to both of these units in the model. Using a porosity of 0.177 for the Ringold units gives a bulk density of 2.18 g/cm^3 and is nearly identical to the value of 2.17 g/cm^3 for Ringold sandy gravel for 82% gravel (PNNL-14702 Rev. 1, Table B-27).

The particle density of 2.76 g/cm^3 was used to represent the river alluvium (PNNL-17708). Using a diffusive porosity of 0.177 gives a bulk density of 2.27 g/cm^3.

3.4.4.4 Saturation-Pressure and Relative Permeability Relationships

The relationship between capillary pressure and saturation was characterized using the van Genuchten function (van Genuchten, 1980) and the Mualem pore distribution model (Mualem, 1976). In the stratigraphic representations developed simulation of the 300 Area, only the Hanford formation has the potential to be variably saturated. The parameters needed for the van Genuchten function include the fitting parameters α and n, and the residual water content θ_r. The Mualem function requires the fitting parameter m. The van Genuchten n parameter and θ_r were those reported for sandy gravel (used to represent the Hanford formation) as summarized in PNNL-14702 Rev. 1, Table 4.5 and are based on laboratory measurements. The parameter α reported for sandy gravel is 0.017 cm^{-1} (PNNL-14702 Rev. 1, Table 4-5), but this value was considered to represent too large of an air entry potential and capillary fringe ($\propto 1/\alpha$) for the Hanford gravel. Accordingly, α was assigned a reduced value of 0.1 cm^{-1}. The default option was used for the m parameter where $m = 1 - 1/n$.

3.4.4.5 Specific Storativity

The specific storativity used in the model was taken as the default value where specific storativity = 1×10^{-7} × diffusive porosity. The specific storativity is an insensitive parameter for this application, so this approximation was deemed sufficient. The value of specific storativity was held constant during all simulations and not included as a calibration parameter in the model.

3.5 Groundwater Contaminant Transport

3.5.1 Transport Parameters

Four different material property zones were characterized for the hydrologic system: (1) Hanford formation gravel and sand, (2) Ringold Unit E gravel and sand, (3) undesignated fine grained subunit of the Ringold Formation consisting of gravel, sand, and silt, and (4) river alluvium representing the hyporheic zone of the Columbia River. The Hanford formation gravel and sand zone was further divided into saturated and vadose zones for purposes of assigning different dispersivities (the need for this is explained in Section 3.5.1.1). Groundwater transport parameters used in the model include:

- Dispersivity
- Molecular diffusion

- Sorption/desorption rate parameters

Calibration metrics to be used to measure the goodness of fit of the calibrated model are also defined.

3.5.1.1 Dispersivity

The initial longitudinal dispersivity used in the models (to begin the calibration process) was 8.75 m for the both the Hanford formation and the Ringold Unit E. A dispersivity of 8.75 m reflects the value derived using the weighted least squares method of Xu and Eckstein (1995); EPA (2011) based on the approximate plume length. The longitudinal dispersivity was set to 1.0 m for both the Ringold fine grained and the river alluvium units. These values are comparable to previous modeling studies that assigned values of 1 m to 3 m for Hanford longitudinal dispersivity and values of 0.5 to 3.0 m for both Ringold units (PNNL-17708, Ma et al., 2010, PNNL-16396).

For all material property zones, except the Hanford vadose zone, the vertical transverse-to-longitudinal dispersivity ratio was set to 0.01 during calibration of the model. Previous modeling studies at Hanford have set the transverse-to-longitudinal dispersivity ratio from 0.01 to 1.0 (PNNL-16396, PNNL-17708, Ma et al., 2010). Dispersivity parameters were adjusted for the Hanford and Ringold Unit E units during calibration. Longitudinal dispersivity for the Hanford vadose zone (above the PRZ) was set at one-tenth of Hanford formation longitudinal dispersivity while the transverse dispersivity remained unchanged. This was done because the dispersivity in the unsaturated media is typically less than that in the saturated zone owing to the differing transport distances and grid dimensions (Xu and Eckstein, 1995).

3.5.1.2 Molecular Diffusion

Molecular diffusion is not an influential parameter in an advection-dominated problem such as this one, so the simplest STOMP option was available, the 'conventional' diffusion option with a molecular diffusion coefficient of 2.5×10^{-9} m^2/s and solute partition option of 'continuous', was applied. The molecular diffusion coefficient was held constant during all simulations and not included as a calibration parameter in the model.

3.5.1.3 Sorption/Desorption Rate Parameters

The uranium sorption/desorption parameters applied in the model are developed based on desorption experiments conducted by Bond et al. (2008) and Liu et al. (2008). The results presented in these papers are consistent and therefore are used exclusively for the purpose of developing the sorption parameters. The sorption/desorption related information available from other reports (e.g., PNNL-16435) was evaluated for corroboration of results. The sorption/desorption parameters presented here apply specifically to uranyl ion, which has the chemical formula of $[UO_2]^{2+}$ resulting in oxidation state of +6. For simplicity it is referred in this report as U(VI). The uranyl ion forms from hydrolysis of uranium mineral during water-mineral interaction.

Batch sorption experiments were conducted by Bond et al. (2008) on sediments taken from the 300-Area North and South Processing Ponds, the two main disposal basins that were active from 1943 to 1975. Experiments related to desorption of U(VI) were conducted by Bond et al (2008) on <2 mm grain size sediments by contacting them with artificial groundwater of varying alkalinities to mimic the pore water compositions based on groundwater and river water mixing. These batch desorption experiments were conducted for varying lengths of time but the ones for which most information is available are those that were conducted for 96 hours, which are considered of sufficient duration where quasi-equilibrium conditions are established in terms of dissolved U(VI) concentrations in solution. A total of 68 desorption experiments were conducted, some of which are presented in Figures 14.15 and 14.16 of Bond et al. (2008). A complete dataset was made available via a personal communication. This dataset is presented in Table 3-1. The changes in Log K_d for U(VI) (ml/g) as a function of alkalinity of the water is presented in

Figure 3-9. The results indicate that as the alkalinity increases the K_d of U(VI) decreases in general up to approximately 6 meq/L; beyond this point trend appears constant (although this observation based on just a three data points in the upper range). This observed decreasing trend is consistent with the expected results as increasing alkalinity increases the carbonate and bicarbonate content in the water which leads to increased aqueous complexation of U(VI) thereby reducing the K_d.

A multiple regression analysis was undertaken to investigate the effect of various parameters listed in Table 3-1 on the Log K_d. The independent parameters considered were sediment concentration (solid to water ratio), alkalinity of the waters, and labile U(VI) concentration of the contaminated sediments. The labile U(VI) concentration for a soil type provides a practical limit on the amount of U(VI) mass that is available for exchange and can be desorbed. The labile concentration is determined based on exchange with ^{233}U(VI) isotope through spiking the concentration in the secondary stock. All three parameters were evaluated in the regression analysis initially and then dropped sequentially when shown to be statistically insignificant. The coefficient of determination (R^2) was found to be largely dependent on alkalinity. Inclusion of other two parameters in the regression analysis marginally increased the R^2 (from 0.47 to 0.53) and thus those two parameters were not considered in the subsequent calculations. A separate regression analysis indicated that by taking the square root of the alkalinity considerably increased the R^2 (from 0.47 to 0.56). The result of the regression analysis is shown in Figure 3-10, which indicates that a linear relationship exists between the square root of alkalinity and the Log K_d. About 56% of the total variation in Log K_d can be explained by this linear relationship. The regression analysis leads to the following linear relationship model:

Table 3-1. Results of 96 Hour Long Desorption Experiments by Bond et al. (2008)

Index *	Soil Sample**	Artificial Groundwater Solution Number	Sediment Conc. (g/L)	Alkalinity (meq/L)	Labile U(VI) (mol/L)	U(VI) Dissolved (mol/L)	U(VI) Adsorbed (mol/L)	U(VI) Adsorbed (mol/m^2)	Measured K_d (mL/g)	Log K_d (mL/g)
1	NPP 1-16	8	200.00	1.91	3.61E-06	3.47E-07	3.26E-06	5.99E-10	46.90	1.67
2	NPP 1-16	10	200.00	1.03	3.61E-06	1.30E-07	3.48E-06	6.39E-10	133.68	2.13
3	NPP 1-16	11	200.00	0.66	3.61E-06	5.04E-08	3.55E-06	6.53E-10	352.97	2.55
4	NPP 1-16	9	24.73	3.77	4.46E-07	2.90E-07	1.55E-07	2.31E-10	21.62	1.33
5	NPP 1-16	9	49.90	3.91	8.99E-07	4.84E-07	4.15E-07	3.06E-10	17.18	1.23
6	NPP 1-16	9	99.99	3.29	1.80E-06	7.46E-07	1.06E-06	3.88E-10	14.16	1.15
7	NPP 1-16	9	200.41	3.50	3.61E-06	9.09E-07	2.70E-06	4.96E-10	14.84	1.17
8	NPP 1-16	9	399.78	3.04	7.21E-06	1.18E-06	6.03E-06	5.54E-10	12.81	1.11
9	NPP 1-16	9	94.49	4.04	6.28E-06	2.61E-06	3.66E-06	1.43E-09	14.83	1.17
10	NPP 1-16	9	176.51	4.42	7.75E-06	1.92E-06	5.84E-06	1.22E-09	17.23	1.24
11	NPP 1-16	4	24.11	3.77	4.35E-07	2.73E-07	1.62E-07	2.47E-10	24.67	1.39
12	NPP 1-16	4	50.05	3.91	9.02E-07	4.34E-07	4.68E-07	3.44E-10	21.51	1.33
13	NPP 1-16	4	99.99	3.59	1.80E-06	6.85E-07	1.12E-06	4.11E-10	16.31	1.21
14	NPP 1-16	4	399.95	3.59	7.21E-06	9.31E-07	6.28E-06	5.77E-10	16.87	1.23
15	NPP 1-16	4	94.35	4.18	5.90E-06	3.02E-06	2.88E-06	1.12E-09	10.12	1.01
16	NPP 1-16	4	179.92	4.55	7.44E-06	2.04E-06	5.40E-06	1.10E-09	14.73	1.17
17	NPP 1-16	2	200.00	8.28	3.61E-06	1.61E-06	1.99E-06	3.66E-10	6.18	0.79
18	NPP 1-16	3	200.00	1.84	3.61E-06	3.71E-07	3.23E-06	5.94E-10	43.54	1.64
19	NPP 1-16	4	100.00	3.55	1.80E-06	6.85E-07	1.12E-06	4.11E-10	16.31	1.21
20	NPP 1-16	5	200.00	1.00	3.61E-06	1.07E-07	3.50E-06	6.43E-10	162.98	2.21

Table 3-1. Results of 96 Hour Long Desorption Experiments by Bond et al. (2008)

Index *	Soil Sample**	Artificial Groundwater Solution Number	Sediment Conc. (g/L)	Alkalinity (meq/L)	Labile U(VI) (mol/L)	U(VI) Dissolved (mol/L)	U(VI) Adsorbed (mol/L)	U(VI) Adsorbed (mol/m^2)	Measured K_d (mL/g)	Log K_d (mL/g)
21	NPP 1-20	4	24.98	3.87	2.35E-07	1.52E-07	8.31E-08	1.94E-10	21.86	1.34
22	NPP 1-20	4	50.23	3.82	4.73E-07	2.82E-07	1.92E-07	2.22E-10	13.54	1.13
23	NPP 1-20	4	199.82	3.64	1.88E-06	6.28E-07	1.25E-06	3.66E-10	10.00	1.00
24	NPP 1-20	4	400.76	3.55	3.78E-06	8.38E-07	2.94E-06	4.27E-10	8.75	0.94
25	NPP 1-20	4	98.81	3.54	6.22E-06	3.66E-06	2.55E-06	1.51E-09	7.05	0.85
26	NPP 1-20	4	199.71	3.60	7.17E-06	2.74E-06	4.42E-06	1.29E-09	8.07	0.91
27	NPP1-20	3	201.02	2.89	1.89E-06	2.92E-07	1.60E-06	4.65E-10	27.30	1.44
28	NPP1-20	5	199.91	1.43	1.88E-06	8.61E-08	1.80E-06	5.24E-10	104.42	2.02
29	NPP1-20	6	201.66	0.87	1.90E-06	2.65E-08	1.87E-06	5.42E-10	350.98	2.55
30	NPP1-20	12	200.34	5.51	1.89E-06	8.56E-07	1.03E-06	3.00E-10	6.01	0.78
31	NPP1-20	13	201.43	7.35	1.90E-06	8.46E-07	1.05E-06	3.04E-10	6.17	0.79
32	SPP 2-18	8	199.16	2.07	5.05E-07	2.17E-07	2.87E-07	9.43E-11	6.63	0.82
33	SPP 2-18	10	200.32	1.19	5.08E-07	9.71E-08	4.11E-07	1.34E-10	21.11	1.32
34	SPP 2-18	11	199.75	0.60	5.06E-07	2.99E-08	4.76E-07	1.56E-10	79.67	1.90
35	SPP 2-18	9	389.48	3.86	9.87E-07	5.13E-07	4.73E-07	7.95E-11	2.37	0.37
36	SPP 2-18	9	95.41	4.52	4.81E-06	3.89E-06	9.28E-07	6.36E-10	2.50	0.40
37	SPP 2-18	9	181.16	4.18	5.03E-06	3.44E-06	1.59E-06	5.75E-10	2.56	0.41
38	SPP 2-18	9	196.94	4.04	4.99E-07	3.15E-07	1.84E-07	6.11E-11	2.97	0.47
39	SPP 2-18	4	185.10	4.24	5.39E-06	3.42E-06	1.96E-06	6.93E-10	3.10	0.49
40	SPP 2-18	4	397.75	3.99	1.01E-06	4.21E-07	5.87E-07	9.64E-11	3.50	0.54

Table 3-1. Results of 96 Hour Long Desorption Experiments by Bond et al. (2008)

Index *	Soil Sample**	Artificial Groundwater Solution Number	Sediment Conc. (g/L)	Alkalinity (meq/L)	Labile U(VI) (mol/L)	U(VI) Dissolved (mol/L)	U(VI) Adsorbed (mol/L)	U(VI) Adsorbed (mol/m^2)	Measured K_d (mL/g)	Log K_d (mL/g)
41	SPP 2-18	4	95.07	4.47	5.16E-06	4.21E-06	9.49E-07	6.53E-10	2.37	0.38
42	SPP 2-18	3	200.05	1.96	5.07E-07	1.64E-07	3.43E-07	1.12E-10	10.48	1.02
43	SPP 2-18	5	198.94	1.03	5.04E-07	7.96E-08	4.24E-07	1.39E-10	26.80	1.43
44	SPP 2-18	6	198.87	0.60	5.04E-07	3.31E-08	4.71E-07	1.55E-10	71.43	1.85
45	SPP 2-18	4	96.50	3.85	2.45E-07	1.46E-07	9.87E-08	6.69E-11	7.02	0.85
46	SPP 2-18	4	800.70	3.48	2.03E-06	6.89E-07	1.34E-06	1.09E-10	2.43	0.39
47	SPP 2-18	4	1599.78	3.35	4.05E-06	9.53E-07	3.10E-06	1.27E-10	2.03	0.31
48	SPP 2-18	4	95.60	3.76	2.74E-06	1.69E-06	1.05E-06	7.18E-10	6.49	0.81
49	SPP 2-18	4	95.60	3.60	3.99E-06	2.60E-06	1.38E-06	9.47E-10	5.56	0.75
50	SPP 2-18	4	180.80	3.76	2.96E-06	1.59E-06	1.37E-06	4.96E-10	4.79	0.68
51	SPP 2-18	4	183.00	3.72	4.21E-06	2.28E-06	1.93E-06	6.90E-10	4.64	0.67
52	SPP1-18	3	199.93	2.86	2.23E-06	5.87E-07	1.65E-06	3.74E-10	14.03	1.15
53	SPP1-18	5	200.60	1.47	2.24E-06	2.93E-07	1.95E-06	4.41E-10	33.15	1.52
54	SPP1-18	6	201.09	0.83	2.25E-06	1.22E-07	2.13E-06	4.80E-10	86.81	1.94
55	SPP1-18	12	200.54	5.36	2.24E-06	1.37E-06	8.72E-07	1.98E-10	3.18	0.50
56	SPP1-18	13	200.30	7.35	2.24E-06	1.46E-06	7.83E-07	1.78E-10	2.68	0.43
57	SPP 1-18	4	103.06	3.60	1.15E-06	6.32E-07	5.19E-07	2.29E-10	7.97	0.90
58	SPP 2-16	4	50.20	3.60	3.42E-07	3.04E-07	3.84E-08	4.94E-11	2.52	0.40
59	SPP 2-16	4	199.74	3.74	1.36E-06	9.55E-07	4.06E-07	1.31E-10	2.13	0.33
60	SPP 2-16	4	399.87	3.77	2.73E-06	1.57E-06	1.15E-06	1.86E-10	1.83	0.26

Table 3-1. Results of 96 Hour Long Desorption Experiments by Bond et al. (2008)

Index *	Soil Sample**	Artificial Groundwater Solution Number	Sediment Conc. (g/L)	Alkalinity (meq/L)	Labile U(VI) (mol/L)	U(VI) Dissolved (mol/L)	U(VI) Adsorbed (mol/L)	U(VI) Adsorbed (mol/m^2)	Measured K_d (mL/g)	Log K_d (mL/g)
61	SPP 2-16	4	99.23	3.57	5.96E-06	4.50E-06	1.46E-06	9.53E-10	3.28	0.52
62	SPP 2-16	4	198.78	3.58	6.64E-06	4.12E-06	2.52E-06	8.19E-10	3.07	0.49
63	SPP2-16	3	200.46	2.48	1.37E-06	5.30E-07	8.36E-07	2.70E-10	7.87	0.90
64	SPP2-16	5	199.86	1.58	1.36E-06	2.92E-07	1.07E-06	3.46E-10	18.38	1.26
65	SPP2-16	6	200.04	0.83	1.36E-06	1.62E-07	1.20E-06	3.88E-10	37.09	1.57
66	SPP2-16	12	198.40	5.68	1.35E-06	9.32E-07	4.20E-07	1.37E-10	2.27	0.36
67	SPP 1-22	4	100.69	3.62	1.23E-06	6.79E-07	5.54E-07	2.13E-10	8.10	0.91
68	SPP 1-16	4	100.62	3.65	1.71E-06	1.00E-06	7.08E-07	3.32E-10	7.04	0.85

Notes: *Index is provided for convenience only; ** SPP stands for South Process Pond sample and NPP stands for North Process Pond sample. The number following NPP (or SPP) is the sample number and the last number is the depth of the sample in feet.

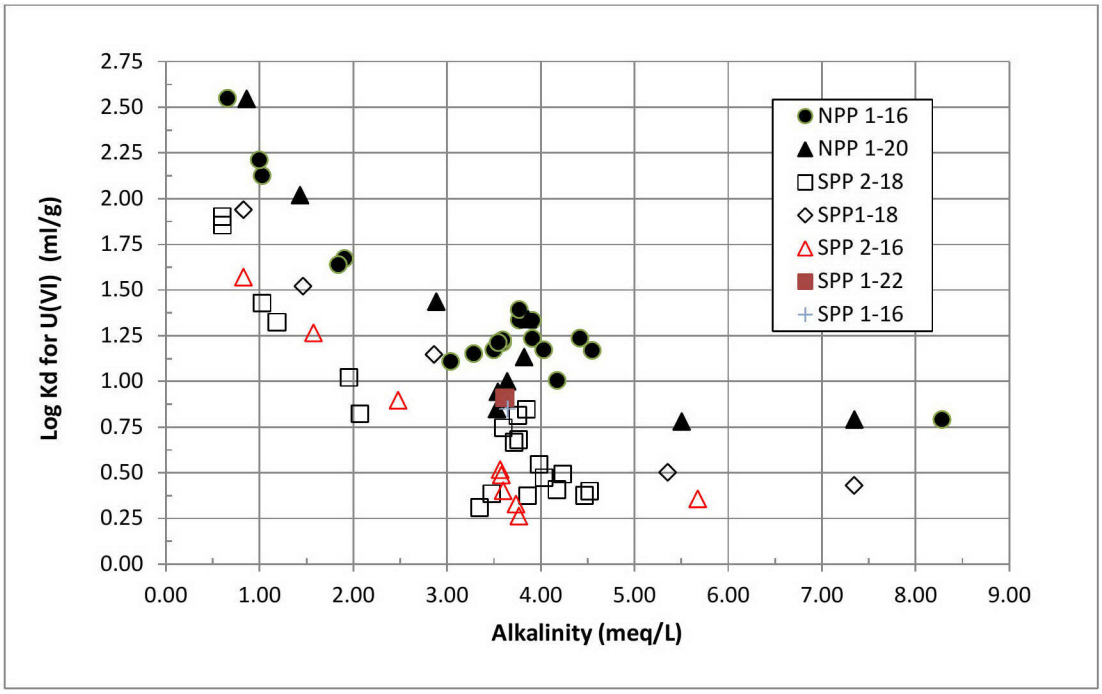


Figure 3-9. Log K_d of U(VI) as a Function of Alkalinity (meq/L) based on Desorption Experiments Conducted by Bond et al. (2008) on <2 mm size Contaminated Sediments

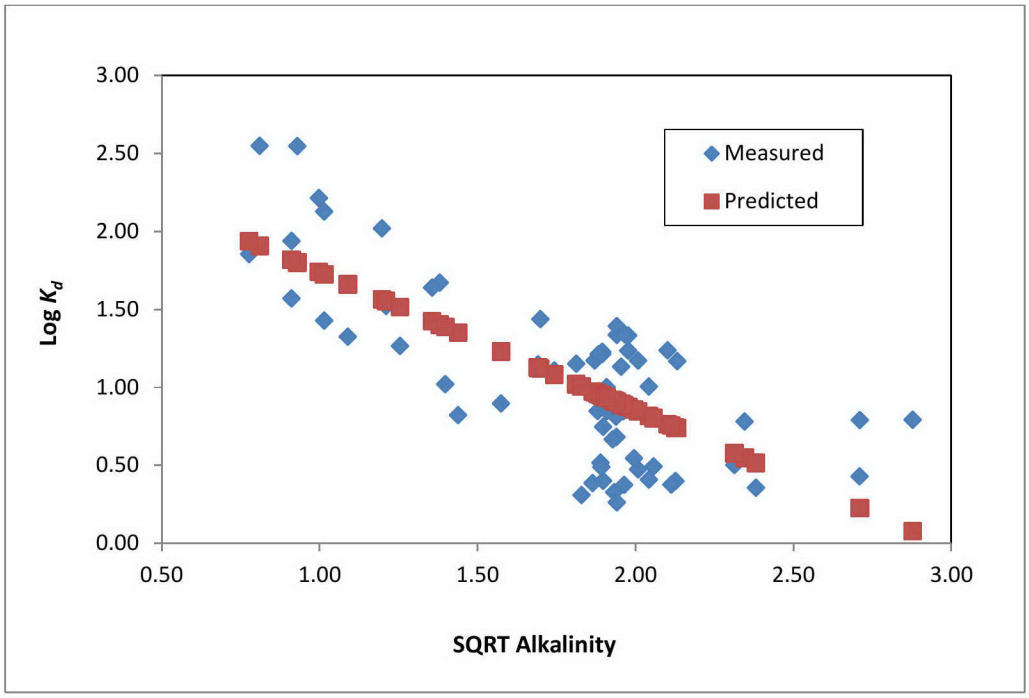


Figure 3-10. Regression Analysis Comparing the Measured to the Predicted Values

$$\log K_d = 2.62 - 0.885\sqrt{Alkalinity} + \varepsilon \qquad \text{Eqn 1}$$

where, ε is the error term describing the unexplained variance.

The predicted Log K_d based on the regression equation (ignoring the error term) are compared to the measured Log K_d in Figure 3-11. The uniform scatter around the 1:1 line indicates that the regression model is reasonable. An analysis of the residuals (difference between the predicted and measured) is undertaken and found to have a mean of 0 and standard deviation of 0.37. Plotting the quantiles of the residuals to that of the standard normal (using a q-q plot) shows a good fit (Figure 3-12) indicating that the residuals are normally distributed. As a result, the error term in Equation 1 can be quantified by a truncated normal distribution with mean of zero and standard deviation of 0.37 that is truncated at ±1 standard deviation. However, to implement this in a transport model a full uncertainty treatment of the Log K_d would be needed through stochastic modeling. Since the calculations being performed for the current analysis are deterministic in nature, the error term can be dropped leading to the following regression equation:

$$\log K_d = 2.62 - 0.885\sqrt{Alkalinity} \qquad \text{Eqn 2}$$

Three different end-member water types are present in the aquifer that may mix in various proportions spatially and temporally. These are: (1) upgradient groundwater; (2) river water; and (3) pore water in the vadose zone (above PRZ). The alkalinity in these water types are different and are summarized in Table 3-2. The average groundwater alkalinity is considered to be 2.574 meq/L based on the average bicarbonate content from 42 wells in the 300 Area while the average river water alkalinity is considered to be 1.128 meq/L based on the average of values during years 2001 through 2007 (Ma et al., 2010, Table 2). The average pore water alkalinity is taken to be 3.2 meq/L based on the average value reported for the LFI boreholes (PNNL-16435) using the ultracentrifugation (UFA) based pore water extraction method.

Since alkalinity is considered a conservative quantity, the alkalinity of waters at any location within the model domain can be calculated based on the relative fraction of end member waters present. This property is used in simplifying the transport simulations. The K_d field within the model domain is calculated based on Equation 2 and by determining the alkalinity of the water based on mixing calculations performed in preliminary simulations performed for this purpose. Note that the K_d value generated is for the <2 mm grain size and needs to be corrected for application to the bulk volume in a similar manner as the soil concentrations are corrected as described in Section 3.5.1. For the purpose of correcting the K_d values (to bulk volume), the average fraction of <2 mm size was deemed to be the size fraction where all of the sorption of U(VI) occurs. No sorption was assumed in other size fractions, a conservative assumption with respect to uranium concentration in water. As a result the K_d value calculated earlier is multiplied by 0.2 representing ratio of the volume (or mass) occupied by <2 mm grain size to the bulk volume (or mass).

Kinetic Sorption

Desorption experiments conducted by Bond et al. (2008) indicated that desorption of U(VI) from contaminated sediments taken from 300 Area varied as a function of time and alkalinity of the water (while holding the sediment mass to water ratio constant). Desorption results from sediment sample, NPP1-16 (at 200 g/L sediment concentration) during reaction with artificial groundwater solutions of varying alkalinities is shown in Figure 3-13. Based on these results the first order desorption rates were determined by linear regression, as shown in Figure 3-14. In almost all experiments it is observed that the amount of desorption is high initially but slows down within a couple of hours. From the modeling point of view, where the calculations are to be performed over time length scale of several years, only the long-term desorption rates are considered. It is observed that the long term desorption rates typically decrease

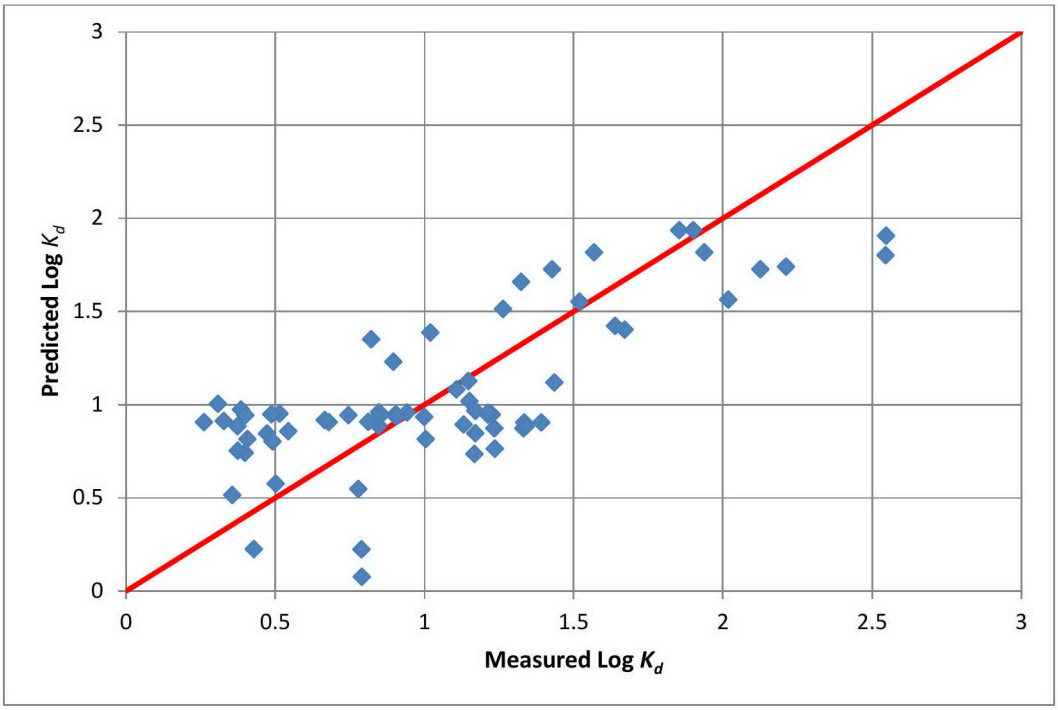


Figure 3-11. Measured Log K_d versus Predicted Log K_d based on the Regression Equation

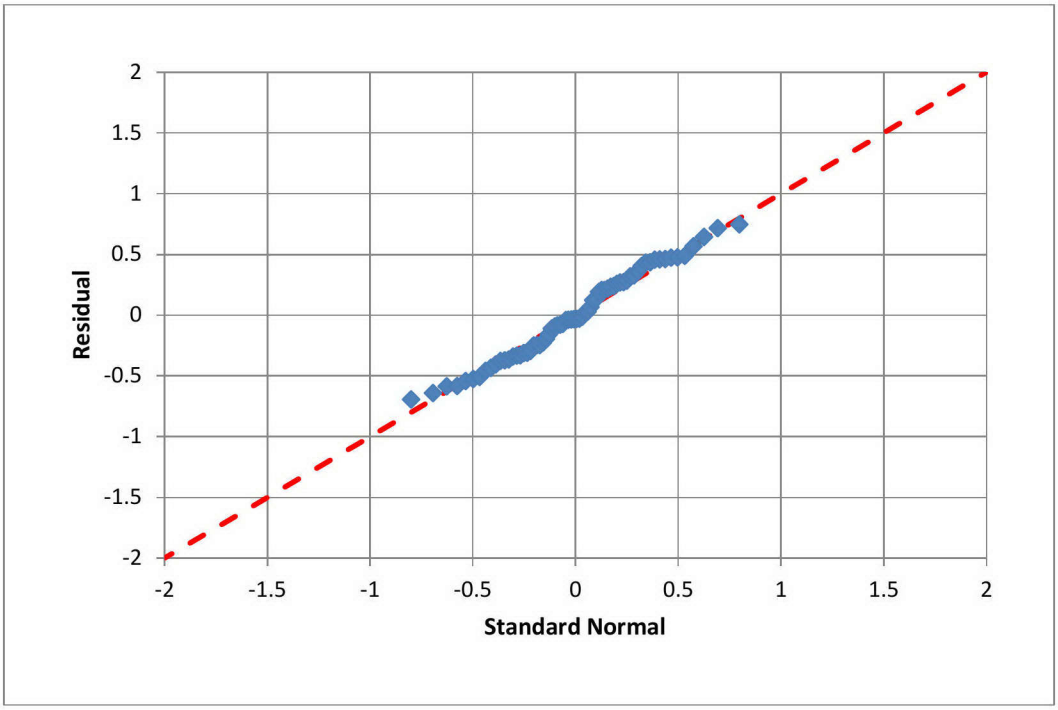
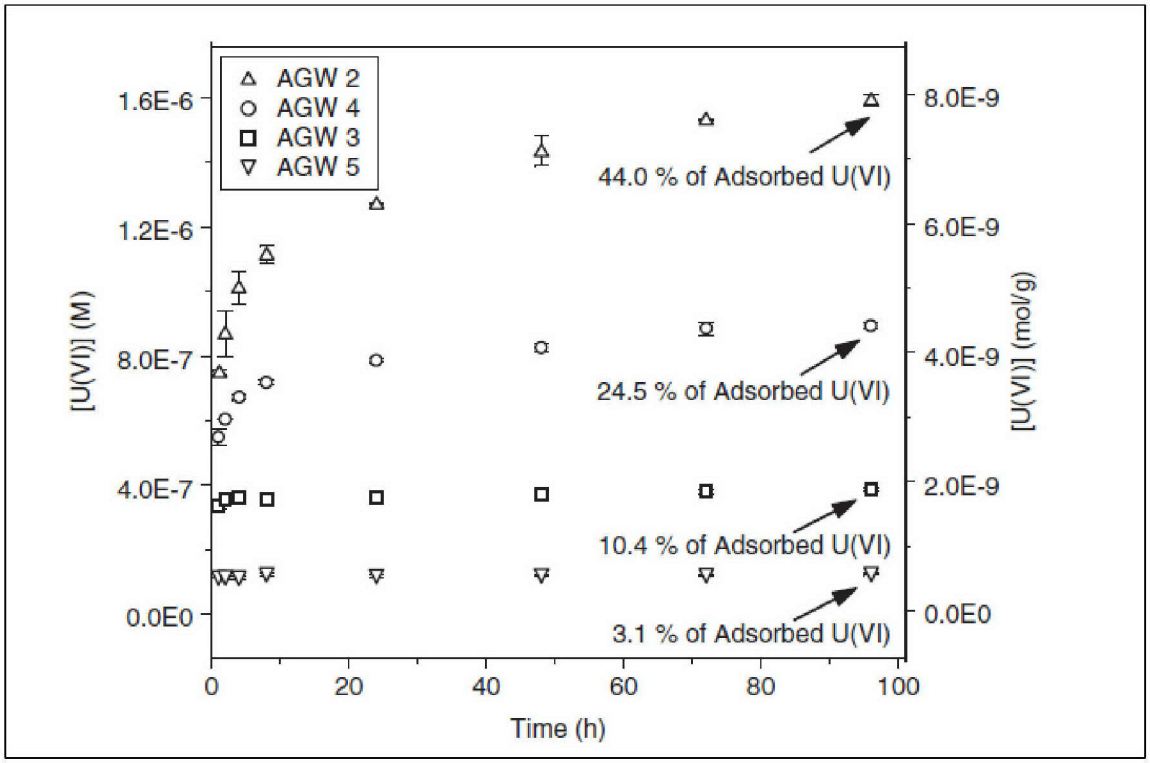


Figure 3-12. Quantile-Quantile Plot of the Residuals against the Standard Normal Distribution

Table 3-2. Alkalinity of the End Member Waters

Water Type	Content	Total Alkalinity (meq/L)
Groundwater: From 42 Wells in Hanford 300 Area (Integrated Field Research Challenge Project) (Ma et al., 2010)	Bicarbonate content (HCO_3^-) of 2.574×10^{-3} mol/L	2.574 meq/L
River water: During 2001-2007 at Richland, Washington (U.S. Geological Survey) (Ma et al., 2010)	Bicarbonate content (HCO_3^-) of 1.128×10^{-3} mol/L	1.128 meq/L
Pore Water: Composition based on Ultracentrifugation of LFI borehole samples (PNNL-16435, Table D.1)	Alkalinity of 160.95 mg/L as $CaCO_3$	3.2 meq/L



Source: Bond et al., 2008

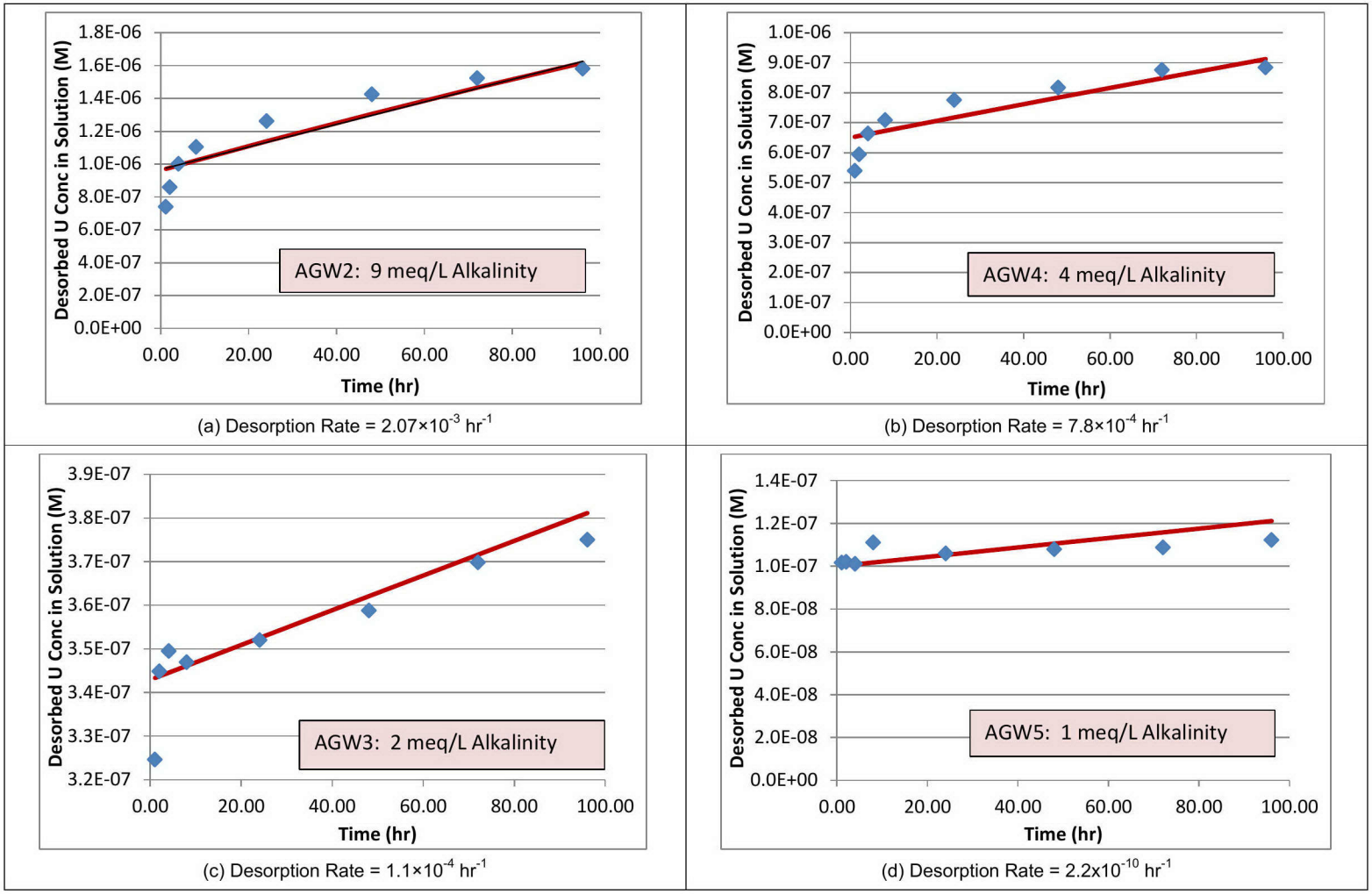
Figure 3-13. Uranium [U(VI] Desorption from Sediment Sample, NPP1-16 (200 g/L), during Reaction with Artificial Groundwater Solutions of varying Alkalinity: AGW2 = 9 meq/L; AGW4 = 4 meq/L, AGW3 = 2 meq/L, and AGW 5 = 1 meq/L (Total Adsorbed U(VI) for the Sample was Estimated from the Amount of Labile U(VI) Determined in 336 h Isotopic Exchange Experiments)

with decreasing alkalinity from 2×10^{-3} hr^{-1} at alkalinity of 9 meq/L to 1×10^{-4} hr^{-1} at the alkalinity of 2.0 meq/L. The desorption rates are much smaller at alkalinity of 1.0 meq/L for the experimental conditions. Because the groundwater in the aquifer has alkalinity of about 2.6 meq/L and is likely to control much of the desorption (ignoring some mixing with river water and vadose zone pore waters), the desorption rates are expected to be in the range of 1×10^{-4} to 7×10^{-4} hr^{-1} (Figure 3-14). Note that these results are based on batch experiments conducted on <2 mm size fraction for one particular sediment type.

The results presented by Bond et al. (2008) based on bicarbonate extraction and isotopic exchange indicates that the labile fraction (the exchangeable uranium fraction) typically ranges from 30% to 60% of the total uranium present in the soil. The labile fraction tends to be lower for soil samples with higher uranium concentration (above 50 μg/g) and typically varies from 30% to <50%. For the purpose of modeling, a 60% labile fraction is chosen initially but for the higher soil concentration regions the labile fraction was adjusted lower (but still within the range) as part of the model calibration exercise.

Liu et al. (2008) conducted column experiments to investigate the scale-dependent desorption of uranyl [U(VI)] from contaminated sediment collected at a depth of about 3 m below ground surface from the 300 Area North Process Pond. Based on the chemical analysis the bulk sediment contained 4.0 nmol/g of U(VI). However, the <2 mm size contained 47.8 nmol/g of U(VI) indicating that almost all of the sorbed U(VI) is associated with <2 mm size fraction, in proportion to its mass fraction (8.3% of total mass). Spectroscopic analysis indicated that majority of sorbed U(VI) was present as a surface complex composed of uranyl carbonate and uranyl hydroxide consistent with the observations of Bond et al. (2008) and others (e.g., PNNL-16435). Liu et al. (2008) performed flow through desorption experiments on the <2 mm size sediments as well as on the bulk sediments (referred as field-textured sediments) and fitted the data using a multi-component kinetic model with the assumption of multiple sites each having its own desorption rate constant. The kinetic desorption rate constants were sampled from a broad log-normal distribution with a geometric mean (median) of 6.4×10^{-5} hr^{-1} that spans over five orders of magnitude range (from $<1\times10^{-7}$ hr^{-1} to $>1\times10^{-2}$ hr^{-1}). The arithmetic mean of the distribution is 2.5×10^{-3} hr^{-1}. This distribution was derived by matching the U(VI) effluent concentration profiles based on desorption experiments on <2mm size and assuming fifty domains (i.e., fifty distinct kinetic rate constants sampled from the distribution) that are distributed within the sample (also called the distributed rate model).

The flow through desorption experiments on field-textured sediments were also performed and the parameters derived from fitting these desorption data on fine grained sediments were used to predict desorption on field-textured sediments. The predictive calculations generally performed well at the peak concentrations but tended to over predict the dissolved concentrations. Liu et al. (2008) used a dual-porosity approach to modify the calculations and to derive better fits to the data. However, this approach was not adopted in the calculations discussed in this report. It was felt that the concept of dual porosity within unconsolidated glacio-fluvial deposits was not well understood at the field-scale to support the RI/FS work. Estimating the mass transfer coefficients between the mobile and immobile domains (within dual porosity concept) and applying at the scale of the model would be extremely difficult with the current state of information. Furthermore, the mass transfer coefficients derived by Liu et al. (2008) were more or less fitting functions on tracer breakthrough and thus do not represent the transfer among mobile and immobile domains in a mechanistic manner. Based on these considerations, a single porosity (single continuum) approach was adopted to support the RI/FS modeling. Separate reactive transport modeling was performed to simulate the laboratory scale desorption experiments and back calculate representative backward (desorption) rate for application to the field-scale kinetic sorption-desorption model.



(a) Desorption Rate = 2.07×10^{-3} hr^{-1}

(b) Desorption Rate = 7.8×10^{-4} hr^{-1}

(c) Desorption Rate = 1.1×10^{-4} hr^{-1}

(d) Desorption Rate = 2.2×10^{-10} hr^{-1}

Note: red lines are linear regressions fit to the data shown.

Figure 3-14. First order U (VI) Desorption Rates Derived from Experiments Presented in Bond et al. (2008, Figure 3.5.2-6)

3.5.1.4 Reactive Transport Equations

The reactive transport equations that are being solved (Fetter 1993) are:

$$\theta \frac{\partial C}{\partial t} = \theta D \frac{\partial^2 C}{\partial x^2} - \theta v \frac{\partial C}{\partial x} - \rho_b \frac{\partial q}{\partial t} \quad \text{Eqn 3}$$

$$\rho_b \frac{\partial q}{\partial t} = \alpha_f \theta C - \alpha_r \rho_b q \quad \text{Eqn 4}$$

$$\alpha_f = \alpha_r K_d \left(\frac{\rho_b}{\theta} \right) \quad \text{Eqn 5}$$

where:

C = aqueous concentration [µmol of dissolved uranium/cm^3-water]

q = amount of solute sorbed per unit weight of solid [µmol of sorbed uranium/g-solid]

θ = water content [water volume/ bulk volume]

ρ_b = bulk density [g-solid/cm^3- bulk volume]

D = dispersion coefficient [cm^2/hr]

v = pore velocity or average linear velocity [cm/hr]

α_f = forward reaction rate constant [hr^{-1}]

α_r = backward reaction rate constant [hr^{-1}]

K_d = equilibrium constant [cm^3-water/g-solid]

Note that of the two rate constants only the backward (desorption) reaction rate constant is needed. The forward rate constant is derived based on Equation 5.

The calculations were performed using a finite difference solution technique using GoldSim Pro®[2] Version 10.11 (GoldSim Technology Group, 2009). The cell-pathway capability of GoldSim Pro® was used to solve the reactive transport equations to match the results of flow-through column experiments. A cell pathway is mathematically equivalent to a mixing cell and can explicitly represent the mass transport processes. When multiple cells are linked together via advective and diffusive mechanisms, the behavior of the cell network is mathematically described using a coupled system of differential equations. In effect, a network of cells is mathematically equivalent to a finite difference network of nodes. GoldSim Pro® numerically solves the coupled system of equations to compute the contaminant mass present in each cell (and the mass fluxes between cells) as a function of time.

Two separate flow through column experiments were conducted by Liu et al. (2008), one on the <2 mm size fraction (in a cylinder of length 10.5 cm and diameter of 2.4 cm) and the other on the field-textured sediments including cobbles and gravels (in a cylinder of length 80 cm and diameter of 15 cm) which also included the fines. Since the experiments included injection of bromide (a conservative non-sorbing species) and desorption of U(VI) (from the contaminated sediments) both processes were simulated based on the experimental conditions. A finite-difference grid composed of ten grid blocks (or cell pathway elements) was created to discretize the transport domain for each experiment in one-dimension (vertical

[2] GoldSim Pro® is a registered trademark of GoldSim Technologies, Inc., Issaquah, Washington.

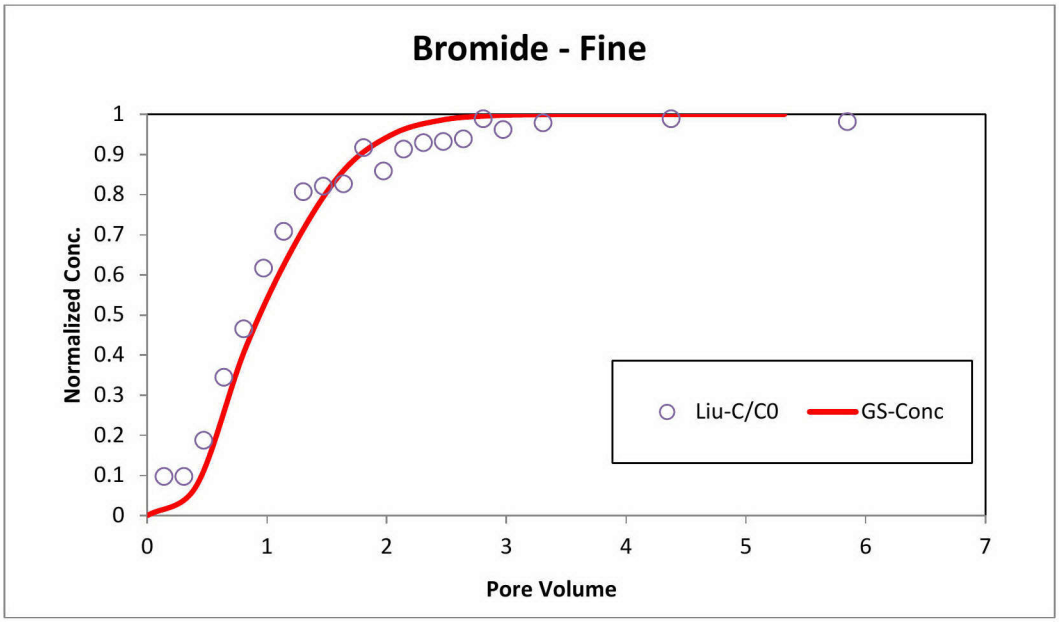
downwards). The boundary conditions imposed were similar to the experimental conditions (specified flow and concentration at the top boundary and a discharge boundary at the bottom) along with other flow and transport parameters. The flow and transport parameters are described in Liu et al. (2008).

The simulations were performed for several pore volumes including a 24-hour stop-flow event. For the fine-grained (<2 mm size) experiments one pore volume is equivalent to approximately 1.22 hours while for the field-textured experiments one pore volume is equivalent to approximately 22.85 hours. The simulation results for the fine-grained column experiments are presented in Figure 3-15. The breakthrough time for bromide matches well, indicating that the transport modeling in one-dimension is adequate. The U(VI) desorption is simulated using kinetic sorption-desorption model (Equations 3, 4, and 5). The desorption rate constant is varied between the geometric mean (median) value (6.4×10^{-5} hr^{-1}) and the arithmetic mean value (2.5×10^{-3} hr^{-1}) of the five order magnitude range used by Liu et al. (2008) to get the best fit to the data using manual calibration. It was observed that the desorption rate declined gradually over time. This observation is consistent with the surface complexation theory which recognizes the variability in the binding energies of various sorption sites. The low affinity sorption sites (also called weak sites) tend to desorb U(VI) at a rate greater than the high affinity sites (also called strong sites) and thus control the early desorption of U(VI). The high-affinity sites however control the long-term release. The desorption rate constant over the long-term (from 5 to 40 pore volumes) was found to be about 6.3e-4 hr^{-1} (Figure 3-15).

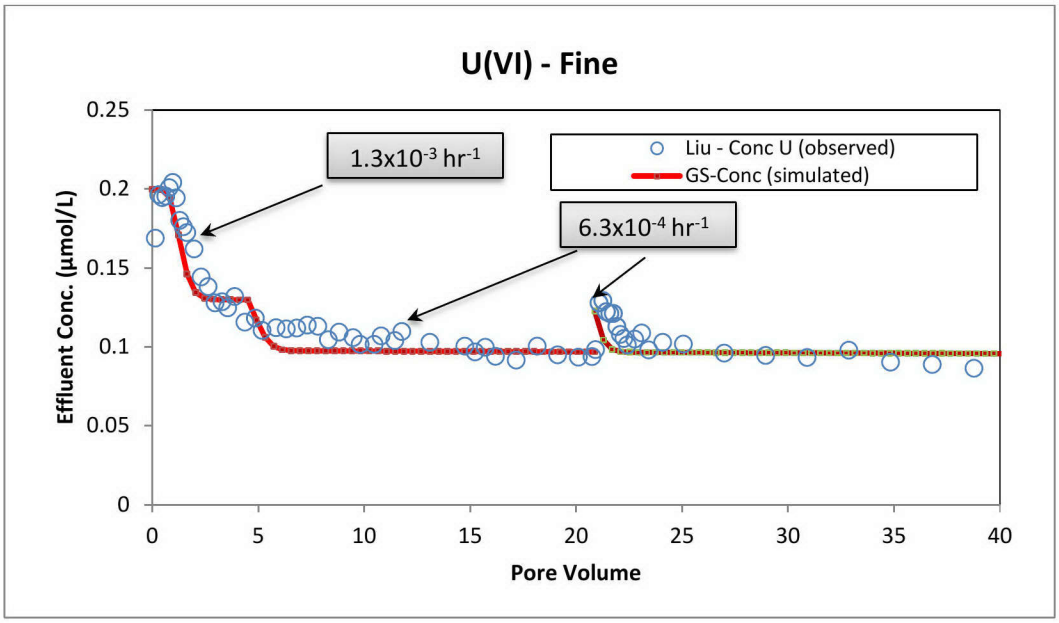
A similar yet separate calculation was performed to match the results of flow-through column experiments conducted on field-textured sediments (which also included the fines) for few pore volumes. The results are presented in Figure 3-16 for breakthrough of bromide and desorption of U(VI) from the sediments. The simulated results compare well for conservative species such as bromide at early times in contrast to experimental data where complete breakthrough was somewhat delayed. This was hypothesized to result from tortuosity, which was not well represented in the model, as bromide ions encountered fine pore spaces within the sediment. Although such tortuous pathways and mass transfer terms can be modeled in STOMP with additional options and parameters, such an effort was deemed unnecessary as the current simpler representation lead to reasonable predictions. The bromide breakthrough simulations indicate that the transport modeling in one dimension is adequate.

The U(VI) desorption was simulated using the same model parameters as done for the bromide and starting with the backward (desorption) reaction rate constant (6.3×10^{-4} hr^{-1}) derived from the fine grained experiments. In order to get a match with experimental data the backward (desorption) reaction rate constant was varied over time as shown in Figure 3-16b. The relative changes in rate constant (6.3×10^{-4} to 1.9×10^{-4} hr^{-1}) indicate a factor of three variation over time. This range is much smaller than the five order magnitude range used by Liu et al. (2008). Furthermore, since these backward reaction rate constants are applied to the simulation time frame of many years, we anticipate that these small variations in reaction rate constants are unlikely to impact the long-term results with regard to the intended use of this model to establish baseline risk and evaluate RAs. For the purpose of transport simulation of uranium conducted for the RI/FS a value of 5×10^{-4} hr^{-1} is selected for backward (desorption) reaction rate constant. This value is chosen as an average between the 6.3×10^{-4} hr^{-1} (at early time) and 4.6×10^{-4} hr^{-1} (about 1.5 pore volumes; refer to Figure 3-16) and rounded to one significant digit.

The backward (desorption) reaction rate constants do not appear to vary much between the fine grained sediments (<2 mm size) and field-textured sediments; this is because the latter includes the former. This is especially true after few pore volumes have passed through the finer grained sediments. It also indicates that the sorption sites on the fine grained sediments control the release of U(VI).



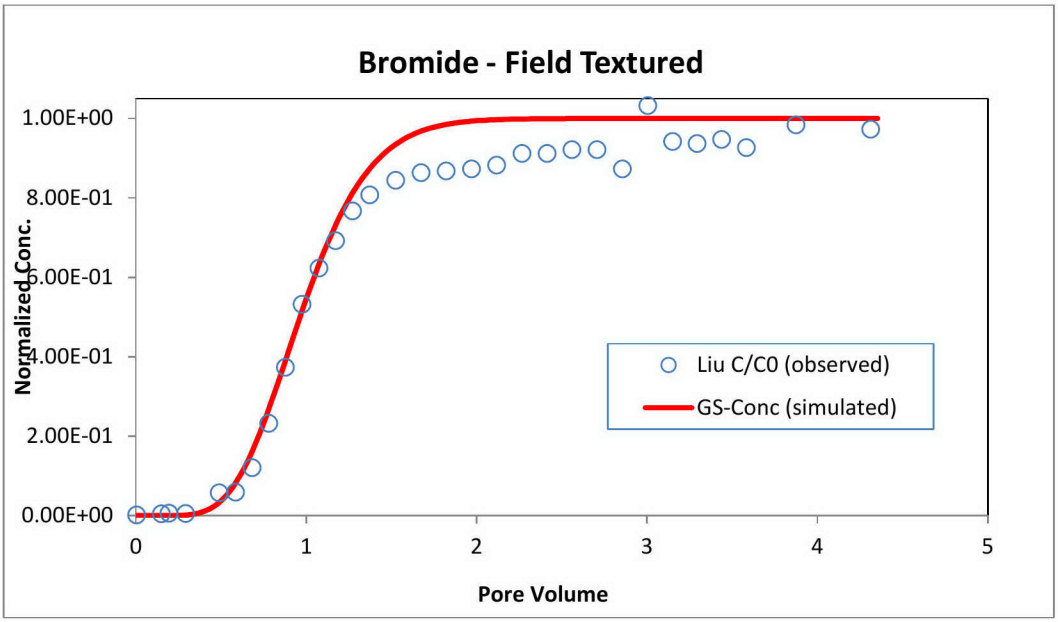
(a)



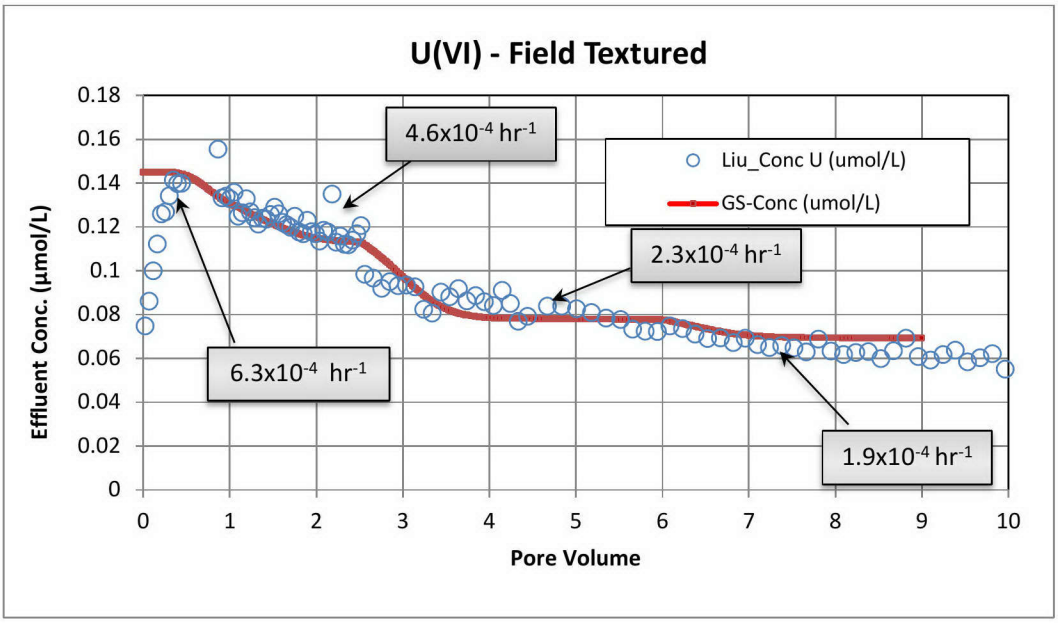
Note: the discontinuity in Uranium concentration observed around pore volume of 21 is due to stoppage of flow for 24 hours followed by restart.

(b)

Figure 3-15. Simulated versus Observed Bromide and Uranium Concentrations based on Flow-through Experiments on Fine Grained (<2 mm size) Column



(a)



(b)

Figure 3-16. Simulated versus Observed Bromide and U(VI) Concentrations based on Flow-through Experiments on Field-textured Sediment Column

Sorption Modeling Parameters

The U(VI) sorption/desorption parameters are developed so that both equilibrium and kinetic sorption processes can be simulated in a transport model developed using STOMP. Because U(VI) sorption/desorption is largely controlled by the carbonate complexation in the unconfined aquifer within 300 Area, the alkalinity variations in the aquifer are the primary control on the U(VI) distribution between the sorbed and aqueous phase. The alkalinity in the aquifer varies as a function of groundwater and river water mixing (Table 3-2). K_d is calculated from Equation 2 for the fine grained sediment. Recall that this value is corrected for bulk volume by multiplying by 0.2, representing the fraction of the volume (or mass) occupied by fine grained (<2 mm grain size) material to the bulk volume (or mass). The forward reaction rate constant for kinetic sorption is calculated as the product of K_d, the backward (desorption) rate constant of 5.0×10^{-4} hr^{-1}, and the ratio of bulk density to porosity (based on field-textured column experiment) employing Equation 5. The bulk density is 1.88 kg/L and the porosity is 0.32 (for media used in the column experiment) leading to the ratio of 5.875. Table 3-3 presents the variation in K_d and forward (sorption) reaction rate constant as a function of river water fraction in the aquifer (a river water fraction of zero indicates all of the water is groundwater). The K_d for U(VI) in the aquifer varies from 3.17 L/kg (all groundwater; no river influence) to 9.57 L/kg (all river water; no groundwater) as shown in Figure 3-20. The forward (sorption) reaction rate constant varies from 9.31×10^{-3} hr^{-1} to 2.81×10^{-2} hr^{-1}, respectively.

The K_d for pore water (above the water table) is calculated separately to be about 2.18 L/kg, based on the pore water alkalinity 3.2 meq/L.

3.5.2 Initial Contaminant Distribution

Leapfrog Hydro™ (ARANZ Geo Limited, 2010) was used to interpolate the 3-D uranium soil concentration distribution within the subsurface of the 300 Area. Input data consisted of spatially referenced soil concentrations with sample dates ranged from 1991 through 2010 for soil. Soil concentrations of U-238 in pCi/g were compiled from HEIS (Hanford Environmental Information System), PNNL-17793, *Uranium Contamination in the 300 Area: Emergent Data and their Impact on the Source Term Conceptual Model* (Tables 5.11, 5.22 and 5.47) and PNNL-16435 (Table D.2). Additional data from Peterson (2010) in the form of a letter report is included in Attachment A. All soil concentrations for uranium were reported by analyzing grain size of <2 mm (by removing the gravel fraction). The location of the soil samples is presented in Figure 3-17 based on four depth ranges as noted.

Contamination Verification Package (CVP) samples from HEIS were filtered by removing samples marked as duplicates and overburden/staging pile area measurements. Also measurements from soil that was subsequently excavated after measurement were removed from the dataset. The CVP data did not come with discrete depth measurements. Depths were assigned at 5 m and 7.5 m for measurements classified as "Shallow" and "Deep", respectively. The "Shallow" data were set at the lowest probable depth while the "Deep" data were set the midpoint of possible depths. Additionally, for soil samples, results based on one lab method (UISO_Plate_AEA) were used for consistency and comparability of data. This method detects the isotopes of uranium using alpha spectroscopy. All data for soil that were below the detectable limit were set to zero. The soil concentration results for U-238 isotope were used in the calculations for uranium modeling since almost all (99.3%) of the uranium is composed of U-238.

Since the soil sample analyses were based on grain size of <2 mm, the soil concentrations were corrected for gravel content for the purpose of modeling on the bulk volume basis. The gravel correction factor was derived by determining the fraction of <2 mm grain size in the 300 Area soils. The unconsolidated sediment samples collected at various depths during the drilling of four limited field investigation (LFI) boreholes (drill diameter 10-in [25.4 cm] with continuous cores samples of 5-in [12.7 cm] diameter) were

Table 3-3. Calculation of U(VI) Sorption Parameters for Implementation in the Transport Model

River Fraction	Alkalinity (meq/L)	Log K_d (mL/g) For <2 mm grain size sediment	K_d (mL/g) For <2mm grain size sediment	K_d (mL/g) Corrected to Bulk Volume	Forward Rate Constant (hr^{-1})*
0	2.57	1.20	15.85	3.17	9.31E-03
0.05	2.50	1.22	16.60	3.32	9.75E-03
0.1	2.43	1.24	17.40	3.48	1.02E-02
0.15	2.36	1.26	18.25	3.65	1.07E-02
0.2	2.28	1.28	19.15	3.83	1.13E-02
0.25	2.21	1.30	20.12	4.02	1.18E-02
0.3	2.14	1.33	21.15	4.23	1.24E-02
0.35	2.07	1.35	22.25	4.45	1.31E-02
0.4	2.00	1.37	23.43	4.69	1.38E-02
0.45	1.92	1.39	24.70	4.94	1.45E-02
0.5	1.85	1.42	26.06	5.21	1.53E-02
0.55	1.78	1.44	27.52	5.50	1.62E-02
0.6	1.71	1.46	29.10	5.82	1.71E-02
0.65	1.63	1.49	30.81	6.16	1.81E-02
0.7	1.56	1.51	32.66	6.53	1.92E-02
0.75	1.49	1.54	34.67	6.93	2.04E-02
0.8	1.42	1.57	36.85	7.37	2.16E-02
0.85	1.34	1.59	39.23	7.85	2.31E-02
0.9	1.27	1.62	41.84	8.37	2.46E-02
0.95	1.20	1.65	44.71	8.94	2.63E-02
1	1.13	1.68	47.87	9.57	2.81E-02

* Calculated from reverse (desorption) reaction rate constant of 5×10^{-4} hr^{-1}, bulk density of 1.88 kg/L, and porosity of 0.32, based on desorption experiments conducted on field-textured sediments by Liu et al. (2008).

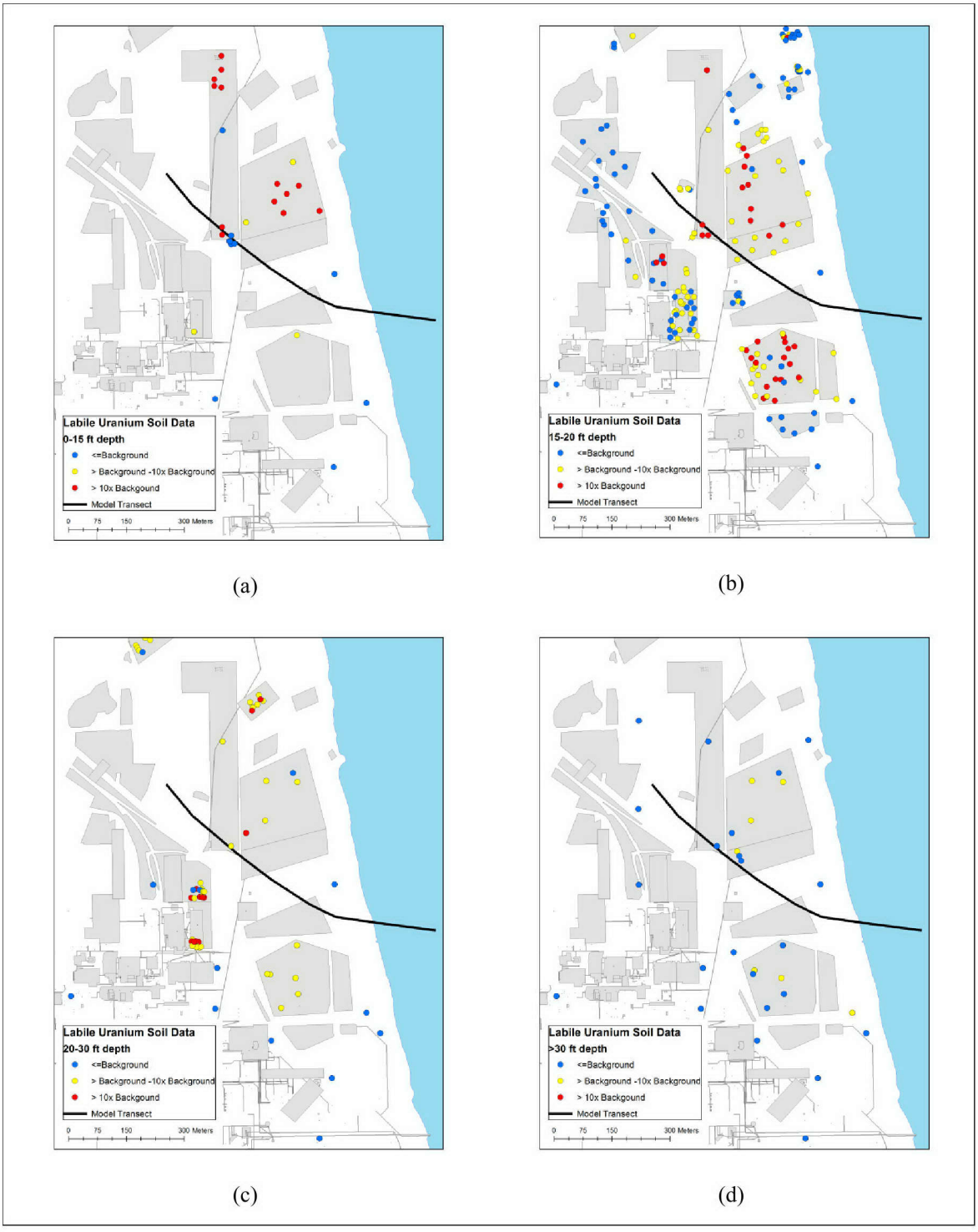


Figure 3-17. Location of Uranium Soil Samples at a Depth Range of a) 0 to 15 ft bgs, b) 15 to 20 ft bgs, c) 20 to 30 ft bgs, and d) Greater than 30 ft bgs

analyzed for grain-size distribution. Particle-size analyses were performed on the bulk sediments for 20 samples, five from each of the four boreholes (PNNL-16435, Appendix D). The results are presented in Table 3-4 as a percentage of gravel, sand, silt, and clay sizes. The relative distribution of the <2 mm size (sand+silt+clay) and the gravel size is presented in Figure 3-18 indicating that the gravel size fraction in the sediments is predominant, while the <2 mm size fraction varies from 6.5% to 37.5%. The <2 mm size fraction gives an average percentage of 18.89%, which is rounded up to 20% (fraction of 0.2). This is the average volume (and mass) fraction occupied by the <2 mm size compared to the bulk volume. The remaining 80% of the volume was assumed to be occupied by gravels.

The soil concentrations were adjusted for the gravel content as the uranium concentrations are applied in the model on the bulk volume basis. All soil concentrations, determined from the <2 mm fraction, were adjusted (gravel correction) by multiplying by 0.20. Thus, using a background U-238 soil concentration of 3.21 μg/g (1.06 pCi/g, DOE/RL-96-12, *Hanford Site Background: Part 2, Soil Background for Radionuclides*) converts to a value of 0.642 μg/g after gravel correction. Prior to setting initial concentrations, the data was adjusted for the component that would be exchangeable, or labile, which was assumed to be 60% (see Section 3.5.2). The gravel corrected data was multiplied by 0.6 and plumes were re-interpolated. This set the background labile uranium concentration to 0.385 μg/g.

Soil concentration interpolations were constrained within the soil column to below 15 ft (4.6 m) below ground surface (depth of excavation for remedial actions) and above the Ringold units as indicated by the data. Leapfrog Hydro™ (ARANZ Geo Limited 2010) uses radial basis functions for the interpolation. An ellipsoid ratio favoring the XY (horizontal) plane was applied at a ratio of 8:1 (this ratio was selected based on modeling judgment and past experience with plume fitting). The resulting concentrations were used to set initial concentrations for STOMP transport modeling.

These uranium concentrations were then interpolated onto the model grid to set initial concentrations for predictive simulations of saturated and unsaturated flow and contaminant transport in the 300 Area (Figure 3-19). All concentrations initially interpolated onto the grid less than background were set to background.

Subsequent to this modeling effort, depth errors were revealed in some of the depth discrete HEIS dataset. Upon correcting the dataset, and after a thorough evaluation, it became clear that in the original dataset some of the samples showing the highest U-238 concentrations were located at the south end of the 300 Area Process Trenches. These samples were collected prior to excavation and no post-excavation sample was taken at that location (DOE/RL-92-32). However, high dissolved uranium concentrations continue to persist in a nearby well (399-1-17A) just downgradient from this location strongly indicating the presence of uranium source in the vadose zone at that locale. This prompted the decision to retain the high concentration samples at the bottom of the excavated area. Following these corrections a new uranium mass distribution was developed and compared to the one that was developed with the original dataset used for modeling (as initial concentrations). While the new distribution did deviate somewhat from the original distribution it was not sufficient to warrant new simulation. The extent of the change to uranium concentrations was deemed to be small in relation to the level of uncertainty in both distributions. As stated previously, majority of the final compiled soil U-238 dataset was composed of CVP data without specific depth information. The lack of discrete depth for many of the samples causes great uncertainty in the resulting distribution of mass.

Table 3-4. Grain Size Distribution for Various Sediments Collected during Drilling of LFI Boreholes

Well	Depth (ft bgs)		%Gravel	%Sand	%Silt	%Clay	% Sand + Silt + Clay
399-3-18	22.5	23.5	93.28	3.98	1.11	1.63	6.72
	31	32	86.94	9.61	2.37	1.08	13.06
	35	36	82.75	11.39	4.47	1.39	17.25
	36	37	71.48	16.35	8.71	3.45	28.51
	41	42	93.31	4.42	1.73	0.55	6.7
399-1-23	24.5	25.5	71.78	21.15	4.16	2.92	28.23
	31.5	32.5	76.18	19.43	3.02	1.37	23.82
	33.5	34.5	70.59	22.12	5.34	1.95	29.41
	35.5	36.5	76.45	19.73	2.55	1.26	23.54
	53.5	54.5	82.77	13.18	3.03	1.02	17.23
399-3-19	20.5	21.5	62.57	33.5	2.19	1.73	37.42
	33.5	34.5	93.53	4.64	1.05	0.78	6.47
	40	41	83.2	14.21	1.89	0.7	16.8
	46.5	47.5	80.36	18.16	1.05	0.42	19.63
	53	54	83.46	15.6	0.63	0.31	16.54
399-3-20	21	22	80.15	15.96	3.13	0.76	19.85
	39	40	80.35	14.31	2.92	2.43	19.66
	48	49	85.69	12.19	1.47	0.65	14.31
	54	55	86.56	12.72	0.51	0.21	13.44
	80.5	81.7	80.84	16.93	1.91	0.32	19.16
						Average	**18.89**

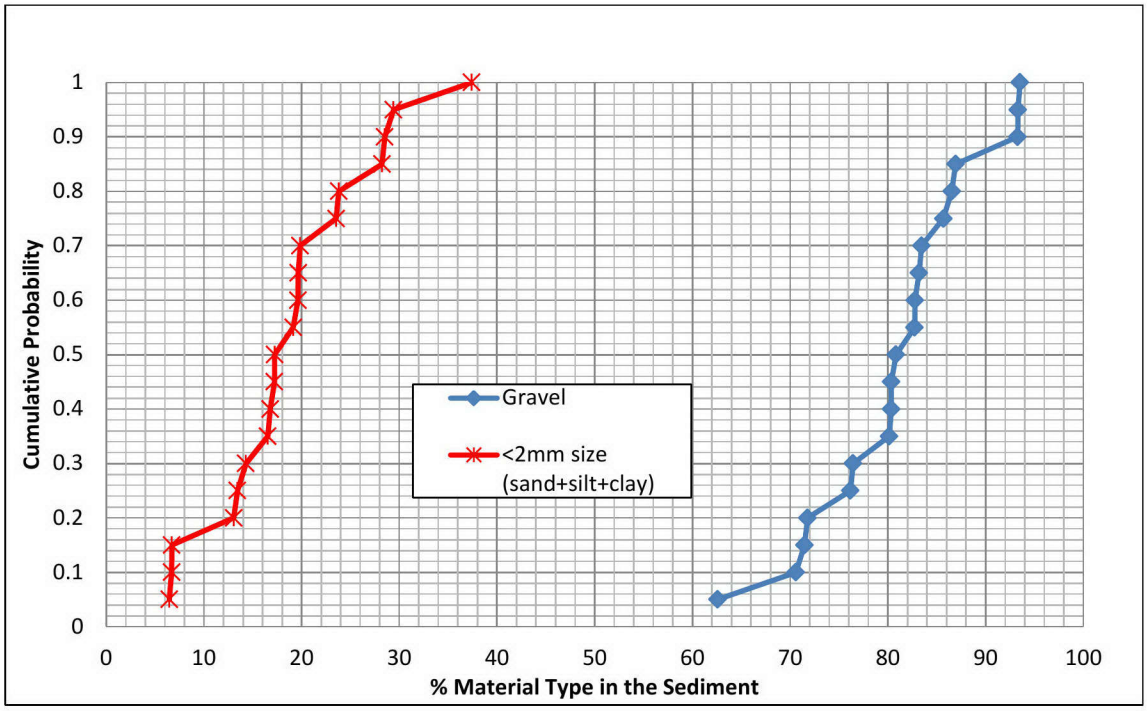
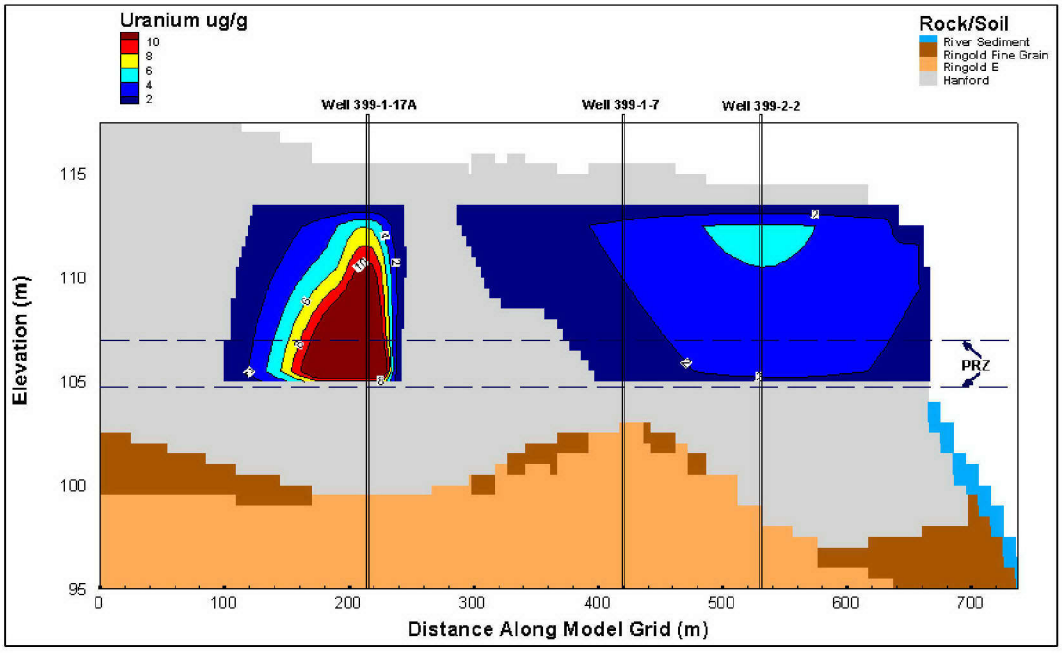


Figure 3-18. Relative Grain Size Distribution of Gravel and <2 mm Size (sand+silt+clay) in the Sediments Collected from Various Depths during the LFI Borehole Drilling



Note: The well locations (vertical lines) are shown for geographic reference only and does not indicate the actual depths and screened intervals.

Figure 3-19. Initial Soil Labile Uranium Concentration Distribution, June-North Model

3.6 Model Calibration

3.6.1 Parameter Calibration

Even though the 2-D cross section models presented herein are not fully capable of completely representing all of the processes that are occurring in the fully 3-D groundwater flow system, the orientation of the models is designed to capture the range in groundwater flow pathways and migration of dissolved uranium towards the river. As such, parameters identified for calibration were adjusted manually (trial and error approach) until simulated water level and electrical conductivity (EC) at various well locations along or near the cross section reasonably matched observed values within screened intervals at those wells. Determination of overall fit of simulated to observed water level and EC was done by visual inspection owing to difficulty in using automated calibration tools with the noisy data available (as discussed in Section 5.1.1); no claim is made here that the resulting calibration is an optimum fit but the calibration is adequate for the purposes of this calculation. The EC data was the primary calibration variable since it was the most sensitive to flow and transport parameters that were adjusted during the calibration process. Simulated water levels provided a close match to measured water levels over a wide range of hydraulic conductivity values, which was the only flow parameter adjusted during calibration.

The wells where water level and EC data were collected and used in the calibration process for June-North model included 399-1-17A, 399-1-7, and 399-2-2 (Figure 3-21 and Figure 3-22). Water level and EC data is nearly complete for these wells with well 399-1-7 having the only significant gaps in the time series in September, October and November 2008. The wells used in the December-North model included 399-2-1, 399-3-18, 399-2-5, and 399-3-21a (Figure 3-23 and Figure 3-24), along with 399-3-17a (Figure 3-21 and Figure 3-22).

The EC data for each well were normalized in order to make it directly comparable to the simulated river-tracer concentrations ranging from 0 to 1. The data were normalized using the following:

$$EC_{Norm} = 1 - \frac{(EC_{measured} - EC_{min})}{(EC_{max} - EC_{min})} \qquad \text{Eqn 6}$$

where EC_{Norm} is the normalized EC, $EC_{measured}$ is the measured EC, and EC_{min} and EC_{max} are representative minimum and maximum EC values (representative of the range). The minimum EC of 120 microsiemens per centimeter (µS/cm) was observed closest to the river and in all cases was used to represent the river EC. The river EC of 120 µS/cm was determined from minimum EC measured during 2008-2010 at wells 399-2-1 (120 µS/cm) and 399-3-18 (121 µS/cm), both of which are close to the river, and EC measured in the river averaging 123.6 µS/cm (PNNL-11516, *Locating Ground-Water Discharge in the Hanford Reach of the Columbia River*, Table 4.1). The maximum EC was determined separately for each well and taken as the 95th percentile of the measured data for that well. This approach takes into consideration the spatial variability of groundwater EC.

The river-tracer model was used to model the influx of low EC water during periods of high river stage. For this model, all boundary conditions were assigned a tracer concentration of 0 except for the river boundary which was assigned a value of 1. The simulated tracer concentrations were monitored at different well locations. The simulated well was comprised of model nodes representing the screened interval in the saturated zone. Water saturations were used to determine if nodes were saturated. If a node was saturated for a particular output time, the tracer concentration for that node was included in the average uranium concentration determined for that well. All well-nodes with saturations less than 1.0 were not included in the average for that particular time period.

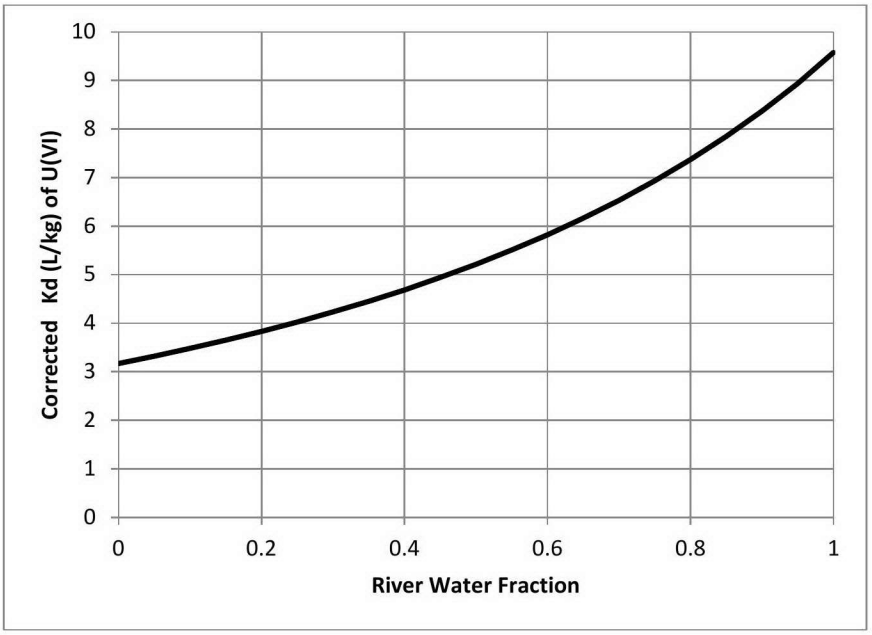


Figure 3-20. Final K_d (L/kg) of U(VI) in 300 Area Unconfined Aquifer Sediment as Function of River Water Fraction (K_d is calculated on the bulk volume)

The parameters adjusted during calibration included:

- hydraulic conductivity (both horizontal and ratio of vertical-to-horizontal) of the Hanford formation and river alluvium, and
- longitudinal dispersivity and ratio of transverse-to-longitudinal dispersivity of the Hanford and Ringold E (same dispersivity applied for both).

During model calibration, the vadose zone above the top of the PRZ was identified as a separate unit and assigned a longitudinal dispersivity one-tenth that of the regular Hanford unit. During the calibration process it was also deemed necessary to adjust the van Genuchten parameter for the Hanford formation. The value of 0.017 cm^{-1} (PNNL-14702 Rev. 1, Table 4.5) provided an air entry pressure that was suspected to be too large and contribute to larger capillary fringes than would be uncharacteristic of sandy gravel. A value for α of 0.1 cm^{-1} was tested and found to be more appropriate and provided more realistic results.

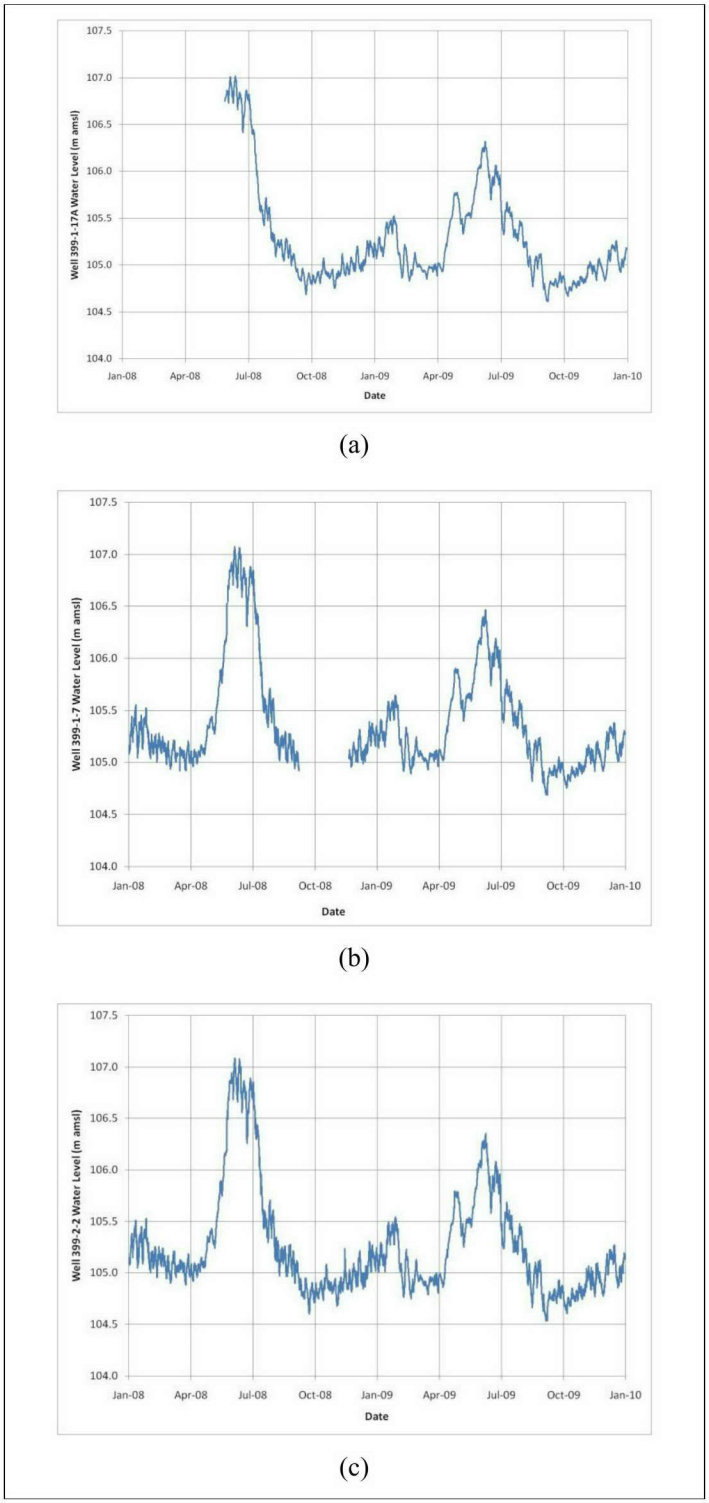


Figure 3-21. Measured Water Levels for 2008 and 2009 at Wells a) 399-1-17A, b) 399-1-7, and c) 399-2-2

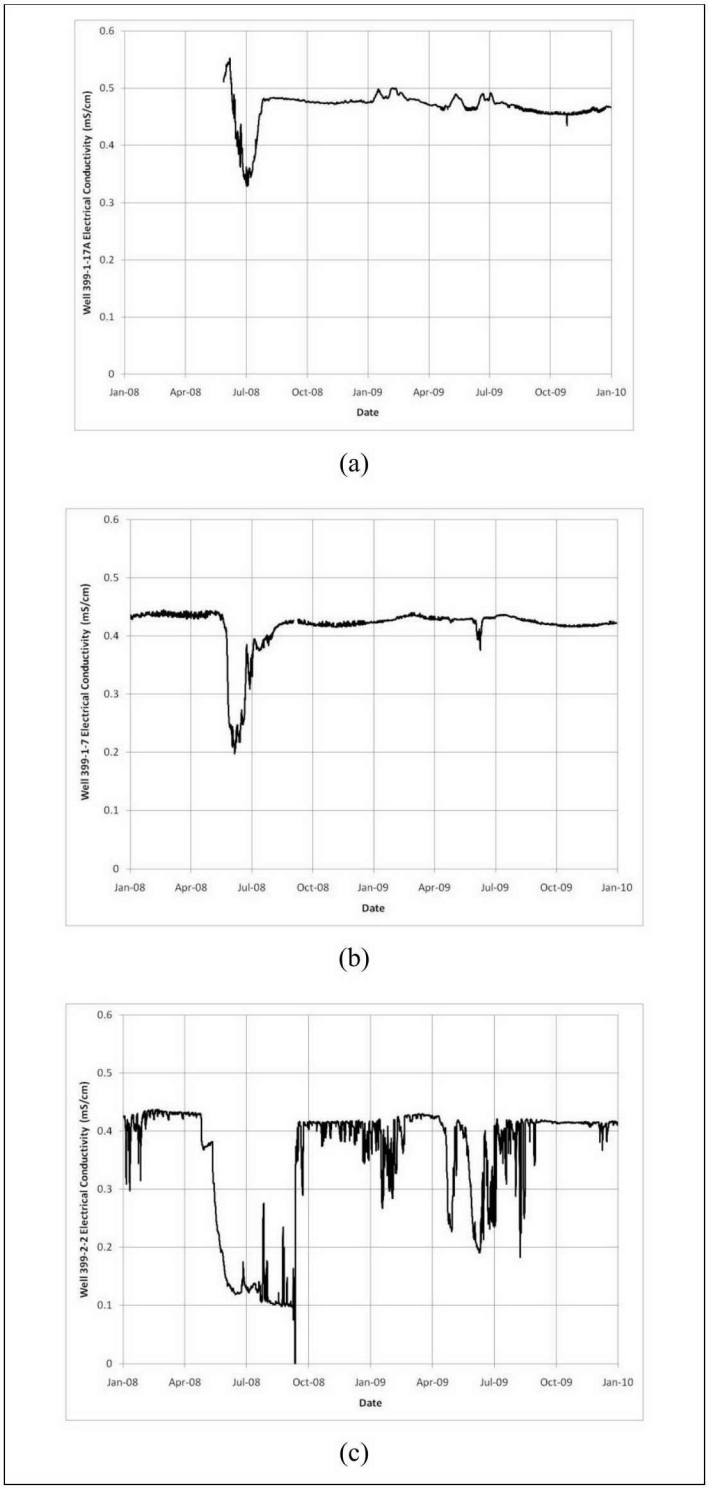


Figure 3-22. Electrical Conductivity Values, Corrected to 25°C, during 2008 and 2009 at Wells a) 399-1-17A, b) 399-1-7, and c) 399-2-2

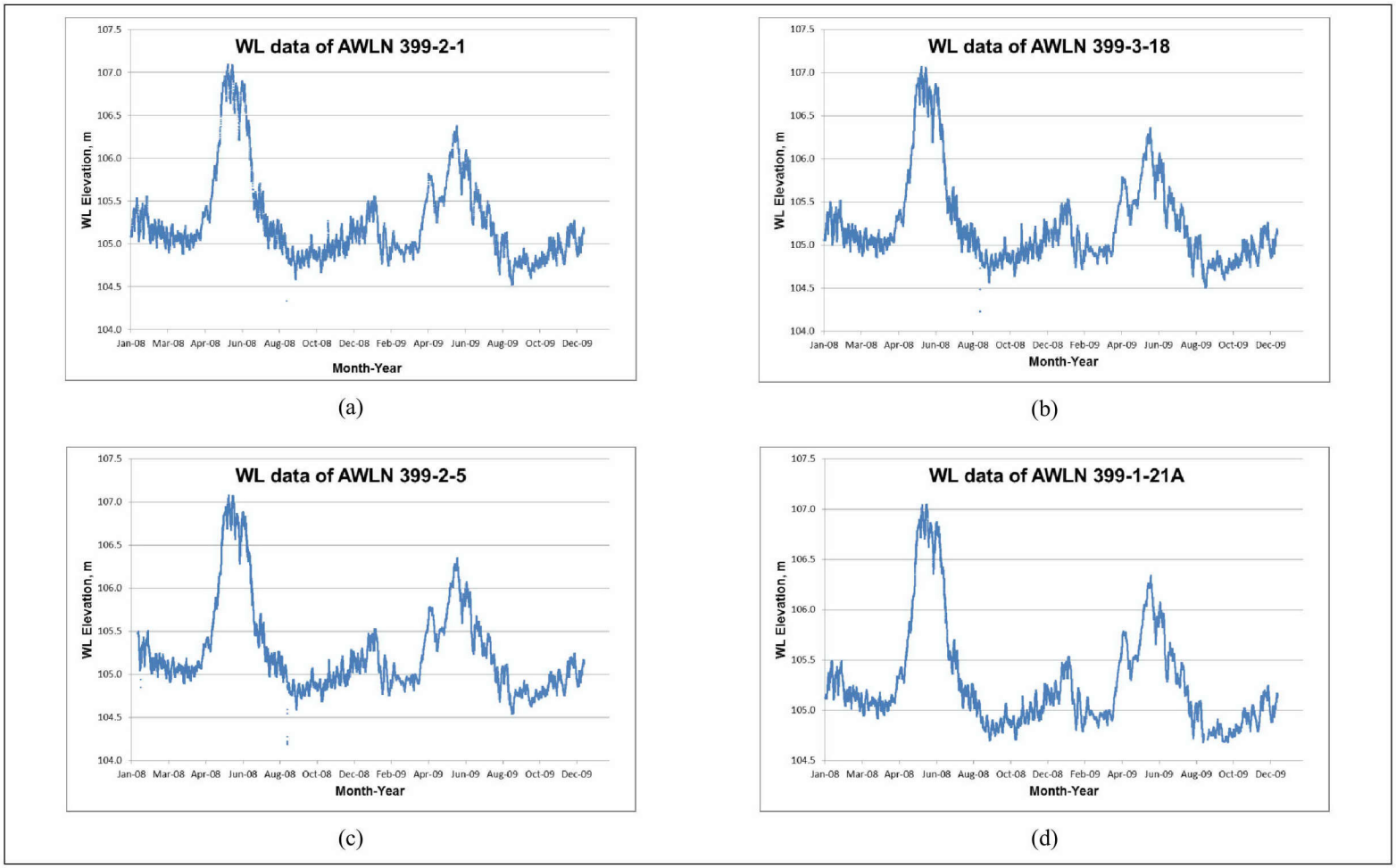


Figure 3-23. Measured Water Levels for 2008 and 2009 at Wells: a) 399-2-1, b) 399-3-18, c) 399-2-5, d) 399-1-21A

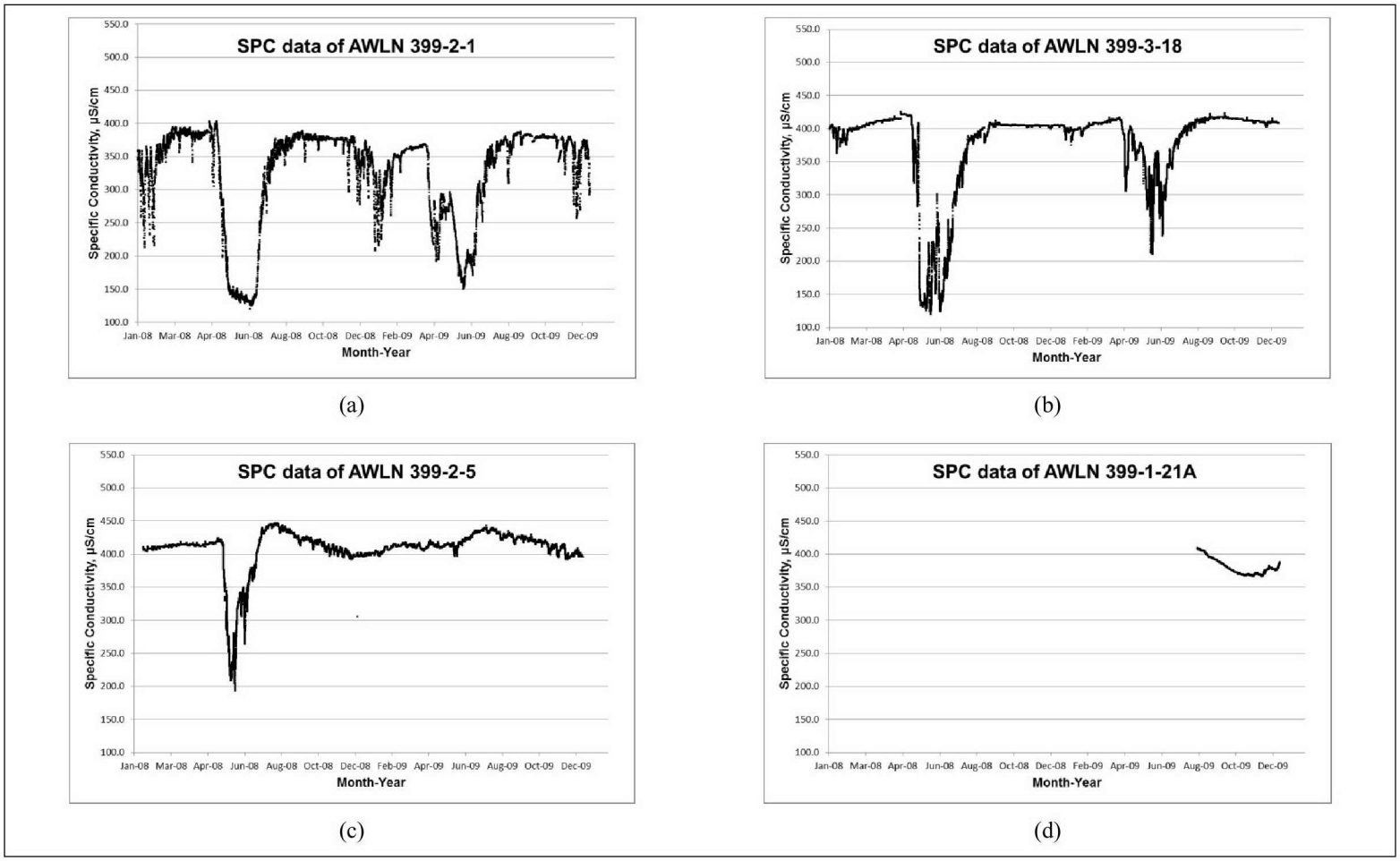


Figure 3-24. Electrical Conductivity Data used in the December-North Model Calibration: a) 399-2-1, b) 399-3-18, c) 399-2-5, and d) 399-1-21A

3.6.2 Calibration Metrics

Two statistics are used to evaluate the goodness-of fit for the calibrated model. These are the mean absolute error (*MAE*), and the bias (*B*). The *MAE* is defined as:

$$MAE = \frac{1}{N}\sum_{i=1}^{N}|P_i - O_i| \qquad \text{Eqn 7}$$

where N = number of steps,

P = predictions,

O = observations, and

i = individual sample pair at a given time (predicted and observed).

The bias (*B*) is defined as:

$$B = \frac{1}{N}\sum_{i=1}^{N}(P_i - O_i) \qquad \text{Eqn 8}$$

3.6.2.1 Uranium Model History Matching

Initial soil uranium concentrations used in the uranium transport model were based on data collected from 1991 through 2010. The resulting simulated groundwater uranium concentrations at representative well locations along the June-North transect were compared to measured concentrations at those wells to determine if adjustments in initial soil uranium concentrations interpolated elsewhere in the model were needed. Uranium transport modeling was not conducted using the December-North transect.

4 Software Applications

The groundwater flow and uranium transport calculations were performed using the STOMP (Subsurface Transport Over Multiple Phases) (Version 3.2; Build 2) code with Hanford Information System Inventory (HISI) identification number 2471. The STOMP operational modes STOMP-W and STOMP-W-R were utilized for the calculations. The software was approved and controlled in accordance with PRC-PRO-IRM-309 *Controlled Software Management*.

Both modes of the STOMP code (STOMP-W: *stomp-w-bd-chprc0001.x* ; STOMP-W-R: *stomp-w-r-bd-chprc02l.x*) were compiled with the banded-matrix solver and executed on the INTERA Austin Linux® Cluster that is owned and managed by INTERA, Inc. in Austin, Texas. The computer property tag identifier for the frontend node is #378 at INTERA's Austin office. The frontend hardware (controller node) is a Dell® Optiplex® 760 with a 3.16-GHz Intel® E8500 processor and 4 GB of RAM loaded.

As given by the command "uname –a", the operating system details are

```
Linux version 2.6.29.4-167.fc11.i686.PAE (mockbuild@x86-
5.fedora.phx.redhat.com) (gcc version 4.4.0 20090506 (Red Hat
4.4.0-4) (GCC) ) #1 SMP Wed May 27 17:28:22 EDT 2009.
```

In addition, the STOMP code (STOMP-W: stomp-w-cg-chprc02i.x) was also compiled with the banded-matrix solver and executed on the INTERA Richland Linux®[3] Cluster that is owned and managed by INTERA, Inc. in Austin, Texas. The computer property tag identifier for the frontend node is #469 at INTERA's Richland office. It is a Dell PowerEdge R510 with two 6-core Intel Xeon X5660 processors @ 2.80GHz and 48 GB of RAM.

As given by the command name "uname –a", the operating system details are

```
Linux green 2.6.32-32-server #62-Ubuntu SMP Wed Apr 20 22:07:43
UTC 2011 x86_64 GNU/Linux (gcc version Ubuntu 4.4.3-4ubuntu5
4.4.3)
```

The results of CHPRC acceptance testing (CHPRC-00515, *STOMP Acceptance Test Report*) demonstrate that the STOMP software is acceptable for its intended use by the CHPRC. Installations of the software are operating correctly, as demonstrated by the INTERA Linux Cluster system producing the same results as those presented for selected problems from the STOMP Application Guide (PNNL-11216, *STOMP Subsurface Transport Over Multiple Phases: Application Guide*) in accordance with CHPRC-00211 Rev. 0. The use of this software was consistent with its purpose, used within its limitations, and was a valid application of STOMP consistent with the functional requirements.

Linux-based scripts were utilized for pre- and post-processing of the model inputs and outputs. Scripts used were both provided with the STOMP software and developed for this specific calculation. Scripts developed for this calculation were checked for correctness as part of this environmental calculation file.

GoldSim® Pro 10.11 software was used for the reactive transport calculations of the measured laboratory data to develop the desorption rate presented in Section 3.5.2. GoldSim Pro® is approved software that is managed and used in compliance with the requirements of PRC-PRO-IRM-309, *Software Control Management*. The GoldSim Pro® calculations were performed on DELL PC, SUNIL-PC (INTERA Property Tag 00362).

Microsoft Excel® 2007 spreadsheets were used to perform various routine calculations and for selected plotting. This use of Excel® is in the spreadsheet category and all calculations were subjected to checking as part of this environmental calculation file.

5 Calculation

The June-North transect was used to develop three distinct models:

- River-tracer model
- Alkalinity model
- Uranium model

The river-tracer model was used to calibrate the flow and transport parameters. The alkalinity model was used to simulate alkalinity variation within the aquifer based on the mixing of the inflowing river water, recharge water, and the background groundwater. The alkalinity distribution was used in one of the equilibrium sorption uranium models where the sorption/desorption parameters were allowed to vary

[3] Linux is the registered trademark of Linus Torvalds in the U.S. and other countries.

spatially and over time. Based on the different sorption treatments, five uranium transport models were developed and used to evaluate the no-action scenario. Two of these were further used to evaluate selected RA scenarios.

The December-North model was developed only as far as the river-tracer model for calibration. The results of the model indicated that the mixing of river water with groundwater was limited in extent, consequently the alkalinity and uranium models were not further developed for the December-North transect as these treatments of sorption offered no additional information without significant river and groundwater mixing.

5.1 June-North Transect

5.1.1 Model Calibration

The river-tracer model for the June-North transect was calibrated for both flow and transport parameters. Insensitivity of simulated heads to flow parameters alone led us to fit both hydraulic head and electrical conductivity simultaneously. The calibration simulation involved running the model for the 2008-2009 two-year period (starting from a coherent initial condition; see Section 3.4.3) and evaluating the fit between the simulated and observed heads as well as the fit between simulated and observed electrical conductivity measurements at wells 399-2-2, 399-1-7, 399-1-17a, and 399-1-12. At the location of each monitoring well along the transect, the model nodes that fell within the top and bottom screen elevation for each well were flagged for output of saturation, hydraulic head, and concentration. For each variable-length time step (STOMP uses an adaptive time stepping scheme to meet convergence and other criteria), the well nodes that registered a water saturation of 1.0 (i.e., fully saturated) were used in the calculation of the average uranium concentration at each well. The arithmetic mean was used for the average where concentrations for all nodes were weighted equally. Determination of goodness of fit was done by visual inspection since the measured well ECs were noisy (see for example Figure 3-22 or Figure 3-24), making a purely quantitative comparison infeasible. Adjustments to parameters governing flow and transport were made and the simulation repeated. This process was repeated until a suitable match (in the judgment of the modeler) was obtained between measured and simulated water levels and ECs, with goodness of fit to be measured using the calibration metrics described in Section 3.6.2).

Parameters adjusted during the calibration process included hydraulic conductivity and dispersivity of the Hanford formation and the river sediment unit. Also the van Genuchten alpha parameter representing the air-entry pressure was modified in the vadose zone to account for higher than expected upward vertical migration of flow into the vadose zone. A separate model layer to represent the vadose zone in the Hanford formation was established above the PRZ in order to apply a longitudinal dispersivity more appropriate for that portion of the model.

Calibration of the uranium model included adjusting initial labile uranium concentrations in soil based on comparison between simulated and measured (1992-2010) groundwater uranium concentrations at representative well locations along the June-North transect. The groundwater uranium concentration data was also used to determine a representative start date for the 200 year simulation based on a visual comparison of the simulated and measured time series.

5.1.2 Aquifer Alkalinity

Two different representations of uranium sorption-desorption were implemented: equilibrium sorption and kinetic sorption. Both sorption models were dependent on the aquifer alkalinity. Five uranium transport models were developed based on different applications of the sorption models:

- Equilibrium sorption, groundwater alkalinity

- Equilibrium sorption, river water alkalinity
- Equilibrium sorption, spatially variable alkalinity
- Kinetic sorption, groundwater alkalinity
- Kinetic sorption, river water alkalinity

A sixth model with kinetic sorption based on spatially variable alkalinity was not developed due to limitation in STOMP for applying spatially variable kinetic sorption parameters.

The groundwater and river water alkalinity models were based on the respective constant, single-value alkalinity end members. The spatially variable alkalinity model reflected alkalinity variations due to mixing of groundwater with river water and vadose zone pore water. The alkalinity, while spatially variable, was also allowed to vary with time during the two-year simulation period. To represent the time-varying aspect of sorption, the two-year period was divided into 29 intervals that were chosen so as to capture the variability in the flow field. The equilibrium sorption parameters for the variable alkalinity model represent point-in-time values for the 29 times indicated (Figure 5-1). Each of the 29 times represents the start of a time period over which each sorption parameter was held constant.

The model was run for the 2008-2009 period with the inland boundary condition set to background groundwater alkalinity (2.57 meq/L), the river boundary condition set to a representative river alkalinity (1.13 meq/L), and the recharge alkalinity set to a value representing alkalinity of recharging vadose zone pore water (3.20 meq/L). The basis for these values is provided in Table 3-2. Alkalinity was modeled as a conservative tracer.

Alkalinity was used to calculate the kinetic forward sorption rate constant and the equilibrium sorption coefficient, K_d. The equilibrium sorption coefficient was calculated using Equation 2 for the < 2 mm size fraction, then corrected for the gravel fraction by multiplying by 0.2. The forward and backward rate constants for the kinetic model were calculated as above (Sec 3.5.2).

5.1.3 Uranium Model – No Action Scenario

Five uranium transport models were used to model the no-action scenario for the June-North transect based on the five different sorption model applications. Within STOMP, initial uranium concentrations are assigned in the model using volumetric concentrations. The volumetric concentrations were calculated from soil concentrations for each grid block based on the bulk density. Simulations were setup to run 100 cycles of the two-year simulation period for a total of 200 years simulation time.

5.2 December-North Transect

5.2.1 Model Calibration

Calibration of the December-North model was attempted using the same procedure as for the June-North model. The wells used for calibration (water level and EC data) include: 399-2-1, 399-3-18, 399-2-5, 399-1-17A and 399-1-21A (Figure 3-3c). The calibration of the river-tracer model for the December-North transect was considered unsuccessful due to our inability to match measured tracer (normalized EC) concentrations with this model, especially for wells further from the river along the transect (see discussion in Section 6.1.2). As a result, the alkalinity and uranium models were not developed for the December-North transect.

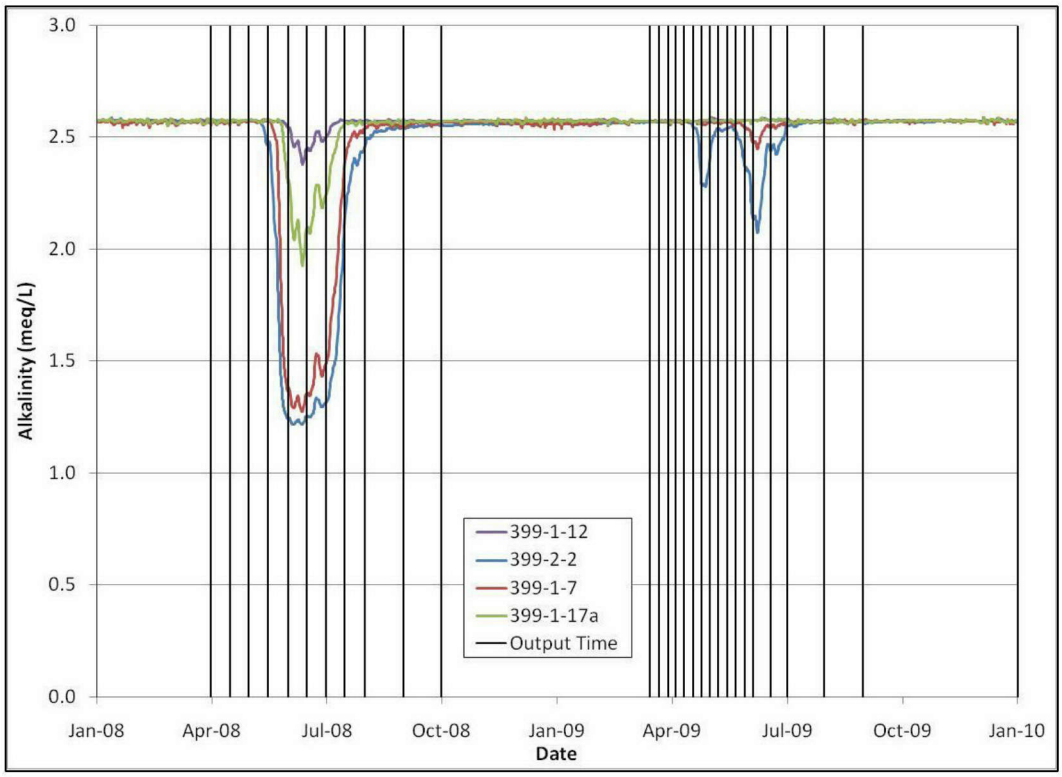


Figure 5-1. Selection of the Alkalinity Transition Times based on the Simulated Alkalinity over Time at Four Selected Well Locations

5.3 Remedial Alternative Simulations

The calibrated June-North model was used to evaluate selected RAs. The purpose of the RA simulations was to provide support to the feasibility study pertaining to remedial actions of the 300 Area waste sites. The selected RA simulated with the 2-D transport model were:

- RA 1 – PRZ Complete Mass Removal
- RA 2 – PRZ/SZ Complete Mass Removal
- RA 3 – Deep VZ/PRZ Source Excavation Prototype #1
- RA 4 – Phosphate Infiltration Prototype #1
- RA 5 – ET Barrier Prototype
- RA 6 – Phosphate Infiltration Prototype #2
- RA 7 – Phosphate Infiltration Prototype #3
- RA 8 – Combined Phosphate Infiltration Deep VZ/PRZ Source Excavation Prototype
- RA 9 – Deep VZ/PRZ Source Excavation Prototype #2
- RA 10- Phosphate Infiltration Prototype #4

A description of what each RA represents and how it was implemented is presented below for reference. The location within the model over which the RA was implemented is presented in Figure 5-2 and Figure 5-3.

RA 1 – PRZ Complete Mass Removal

Removal of all mass from the PRZ to represent the treatment by phosphate injection in the PRZ to remove uranium from the zone that is periodically inundated with groundwater resulting from high-river stage (Figure 5-2a). The PRZ extends from 105 m to 107 m above mean sea level.

RA 2 - PRZ/SZ Complete Mass Removal

In addition to removal of uranium mass from the PRZ as in RA 1, this treatment option removes all uranium mass from the saturated zone (Figure 5-2b).

RA 3 - Deep VZ/PRZ Source Excavation Prototype #1

Deep excavation would consist of removing all uranium mass within three regions of the vadose zone and PRZ (Figure 5-2c). These regions would encompass most of the high-uranium soil concentration locations.

RA 4 - Phosphate Infiltration Prototype #1

Reducing uranium soil mass by 50% in selected regions of the vadose zone would reduce the dissolved uranium concentrations in recharge water migrating downward through the vadose zone and into the underlying saturated zone (Figure 5-2d). This would in turn reduce uranium groundwater concentrations. Removal of uranium mass would be accomplished by treatment with polyphosphate.

RA 5 - ET Barrier Prototype

Reducing infiltrating water into the subsurface would reduce the water migrating through the soil-contaminated vadose zone, effectively reducing the migration and introduction of uranium into the PRZ and saturated zone. Reduction of infiltration would be accomplished by installation of low-permeability caps at the ground surface at two locations overlying the contaminated zones (Figure 5-2e). The recharge was reduced from 55.4 mm/yr in the no-action simulation to 0.5 mm/yr in RA 5.

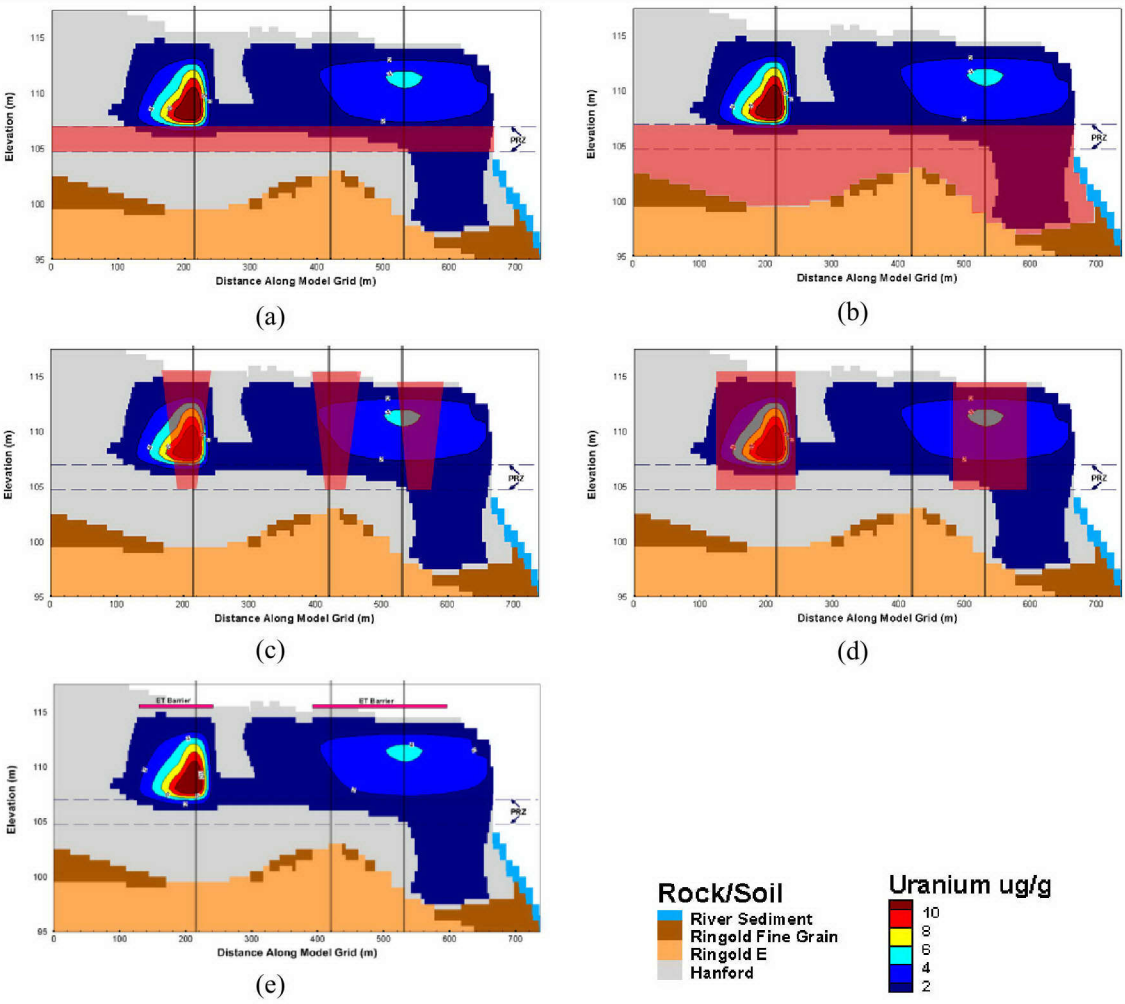
RA 6 - Phosphate Infiltration Prototype #2

Same as RA 4 except for a slightly larger lateral polyphosphate treatment footprint. The uranium soil mass was reduced by 50% in the selected regions of the vadose zone (Figure 5-3a).

RA 7 - Phosphate Infiltration Prototype #3
Same as RA 6 except that the uranium soil mass was reduced by 80% in the selected regions of the vadose zone (Figure 5-3a).

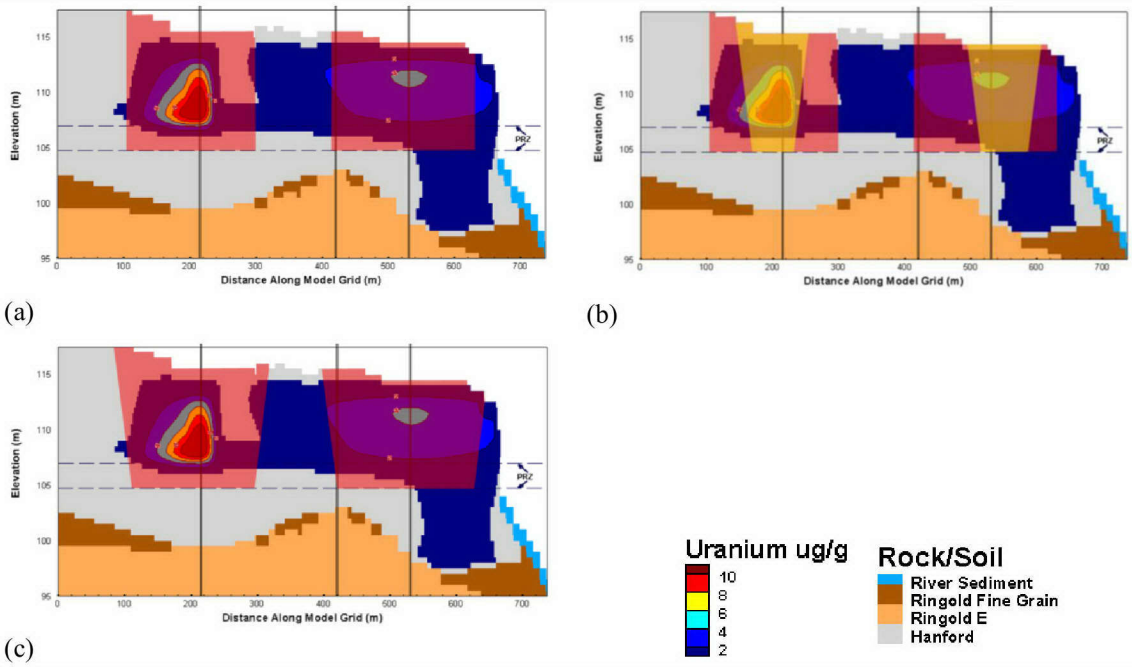
RA 8 - Combined Phosphate Infiltration and Deep VZ/PRZ Source Excavation Prototype

Same as RA 6 except for the additional removal of 100% of the uranium soil mass by excavation from the areas of the vadose zone with the highest soil concentrations, similar to RA 3. The modified selected regions of the vadose zone are presented in Figure 5-3b, with the yellow regions showing the location of the excavated soils within the red-shaded infiltration regions.



Note: The well locations (vertical lines) are shown for geographic reference only and do not indicate the actual depths and screened intervals.

Figure 5-2. Uranium Soil Concentrations at the Start of 2012 along with Outline of Areas Modified for: a) RA 1, b) RA 2, c) RA3, d) RA 4, and e) RA 5



Note: The well locations (vertical lines) are shown for geographic reference only and do not indicate the actual depths and screened intervals

Figure 5-3. Uranium Soil Concentrations at the Start of 2012 along with Outline of Modified Areas (red/yellow shaded areas) for: a) RA 6, 7 & 10, b) RA 8, and c) RA 9

RA 9 – Deep VZ/PRZ Source Excavation Prototype #2

Same as RA 6 except that the polyphosphate treatment footprint was replaced by total excavation of the contaminated soil, i.e. reduction by 100% of the uranium soil mass in the selected region of the vadose zone (Figure 5-3c).

RA 10 – Phosphate Infiltration Prototype #4

Same as RA 6 except that the uranium soil mass was reduced by 30% in the selected regions of the vadose zone (Figure 5-3a).

The simulations were conducted assuming that each RA was applied starting January 1, 2012, 20 years after the model start time of January 1, 1992 (Sec. 6). Models used to evaluate the RAs were limited to the equilibrium sorption, variable alkalinity model and the kinetic sorption, groundwater alkalinity model because these were deemed the most representative of the sorption models.

Implementation of the RAs required the modification of the soil concentrations to represent the mass removal via the RA technology. For RA 1 and 2, the soil uranium concentrations were copied from the 20-year no-action model restart file and pasted into an Excel spreadsheet in *i,j,k* indices order[4] to match the grid coordinates in STOMP. Using *i,j,k* indices in the spreadsheet, the cells to be acted on were selected for the appropriate RA. For RA 1, soil uranium concentrations for cells within the PRZ (for z = 105 to 107 m above mean sea level, $21 \leq k \leq 28$ for all *i*) were set to zero. For RA 2, soil uranium concentrations for all cells below the top of PRZ (for all $k \leq 28$ for all *i*) were set to zero. The RA-modified concentrations were copied into a spreadsheet setup with the required Initial Conditions Card format in STOMP. The contents of the Initial Conditions Card spreadsheet were copied into the Initial Conditions Card in the STOMP input file using the 'Overwrite' specification and the RA simulation was run using the 20-year restart file from the no-action simulation.

The initial concentrations for RA simulations 3, 4, and 6 through 10 were done in a similar manner. In these cases, the desired RA scheme was marked by hand on a computer generated figure of the cross section grid and soil concentrations. A scanned version of that figure was imported into ArcGIS and Geo-referenced. New shapefiles of the areas to be remediated were created by tracing over the Geo-referenced, hand-marked areas. The new shape files were superposed onto a shapefile of the existing grid and the to-be-remediated model cells were selected and labeled with -999, a value that would not be found in the normal data range but used to uniquely flag the to-be-remediated cells. This information was exported and then imported into an Excel spreadsheet where concentrations for flagged cells were selected and modified according to the respective action to be taken (e.g., for excavated cells, a concentration of 0 was assigned). The new initial soil uranium concentrations were then imported into the STOMP input file as was done for RA 1 and 2.

For RA 5, the recharge rates for recharge boundary cells in the Boundary Conditions Card in the STOMP input file were modified to reflect the reduction in recharge. The simulation was restarted using the 20-year restart file from the no-action simulation and the updated input file.

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[4] STOMP uses *i,j,k* indices to denote nodes by index using an increasing number in each of three dimensions; for example, if a Cartesian coordinate system is in use (STOMP can use other coordinate systems, e.g., radial), then *i* denotes the *x*-direction (west to east), *j* the *y*-dimension (south to north), and *k* the *z*-direction (bottom to top). Nodes are then indexed in increasing number starting at 1 in each dimension; thus nodes with index *i*=1, *j*=1, *k*=1 is the first node in the *x*-, *y*-, and *z*-dimensions in this example.

6 Results/Conclusions

6.1 Model Calibration

6.1.1 June-North Model

Within the range of hydraulic conductivity values evaluated for the Hanford formation (2,000 to 12,000 m/d), the match between simulated and measured water levels at wells 399-1-17A, 399-1-7, and 399-2-2 demonstrated that model calibration was insensitive to hydraulic conductivity (that is, the model matched reasonably well observed heads for the range of hydraulic conductivity values considered in the calibration (Figure 6-1). To obtain a robust calibration, transport was included in the calibration process by means of a conservative tracer to represent alkalinity. Thus the three primary parameters adjusted during model calibration included hydraulic conductivity of the Hanford formation and the river alluvium, and the longitudinal dispersivity of the Hanford formation. Secondary parameters were adjusted following primary calibration: these were the anisotropy of the hydraulic conductivity, the vadose zone longitudinal dispersivity, and the van Genuchten α parameter for the Hanford formation.

The characteristics of the measured EC with time at the monitoring wells that were used in comparing the simulated EC with time included the overall shape of the EC with time curve, the maximum normalized EC, and the time of peak EC. For wells closer to the river (399-1-7 and 399-2-2), the model better matched the measured breakthrough (Figure 6-2b and c). For wells further from the river (399-1-17A), the match is not as good (Figure 6-2a). We suspect the poorer fit for wells further inland is largely due to the three-dimensional groundwater flow system underlying the 300 Area being represented by a two-dimensional cross section model. In this case, the inflowing river water has to follow the transect inland from the southeast to the northwest. In the aquifer, some of the river water presumably takes a more direct route from the river to well 399-1-17A during high river stage when the river water is flowing into the aquifer. In the model result presented (Figure 6-2a), the simulated tracer breakthrough occurs earlier than the observed breakthrough suggesting that if hydraulic conductivity were decreased then the tracer would migrate slower and simulated breakthrough would occur later in time and better match the observed EC response. However there is a limited time over which the river stage is high and hydraulic gradients are directed inland. If the hydraulic conductivity is reduced, then the river tracer front does not migrate far enough inland (along the transect) before the gradient reverses and the intruded river water migrates back towards the river (note the flow vector directions indicated Figure 6-3 which shows direction and magnitude of groundwater flow along the transect). As a result, the breakthrough is observed at 399-1-17A but at smaller concentrations representing less breakthrough of the river-tracer front. Increasing the hydraulic conductivity causes the simulated breakthrough to occur earlier and at higher concentrations than observed.

The third parameter adjusted during model calibration was the longitudinal dispersivityα_L. This parameter affects the shape of the breakthrough curve. Higher α_L spreads out the front (relatively) and the slopes of the leading and trailing edges of the breakthrough curve are flattened out. The peak concentration will be lower as well. Lower α_L reduces the dispersion leading to a steepening of the leading and trailing edges of the breakthrough curve, and increases the peak concentration.

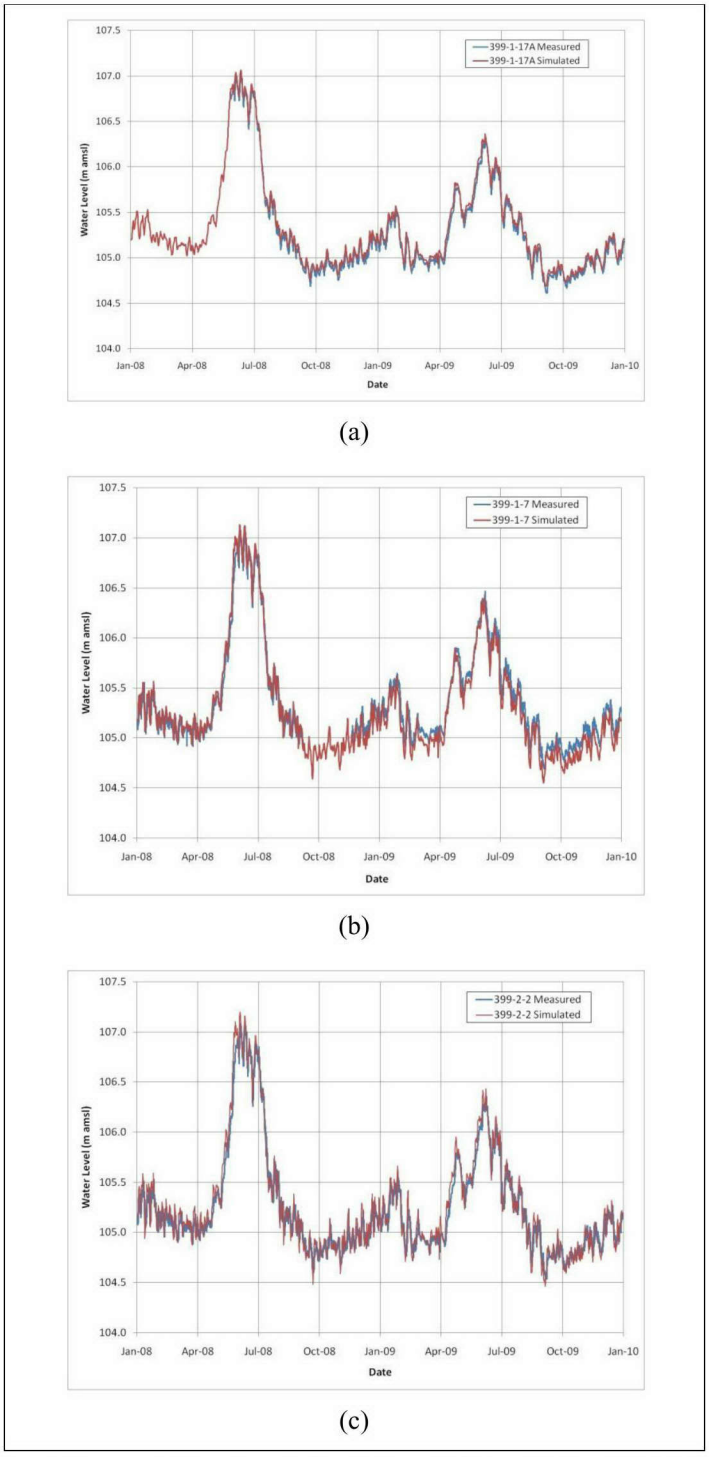


Figure 6-1. Simulated and Measured Water Levels for 2008 and 2009 at Wells: a) 399-1-17A, b) 399-1-7, and c) 399-2-2

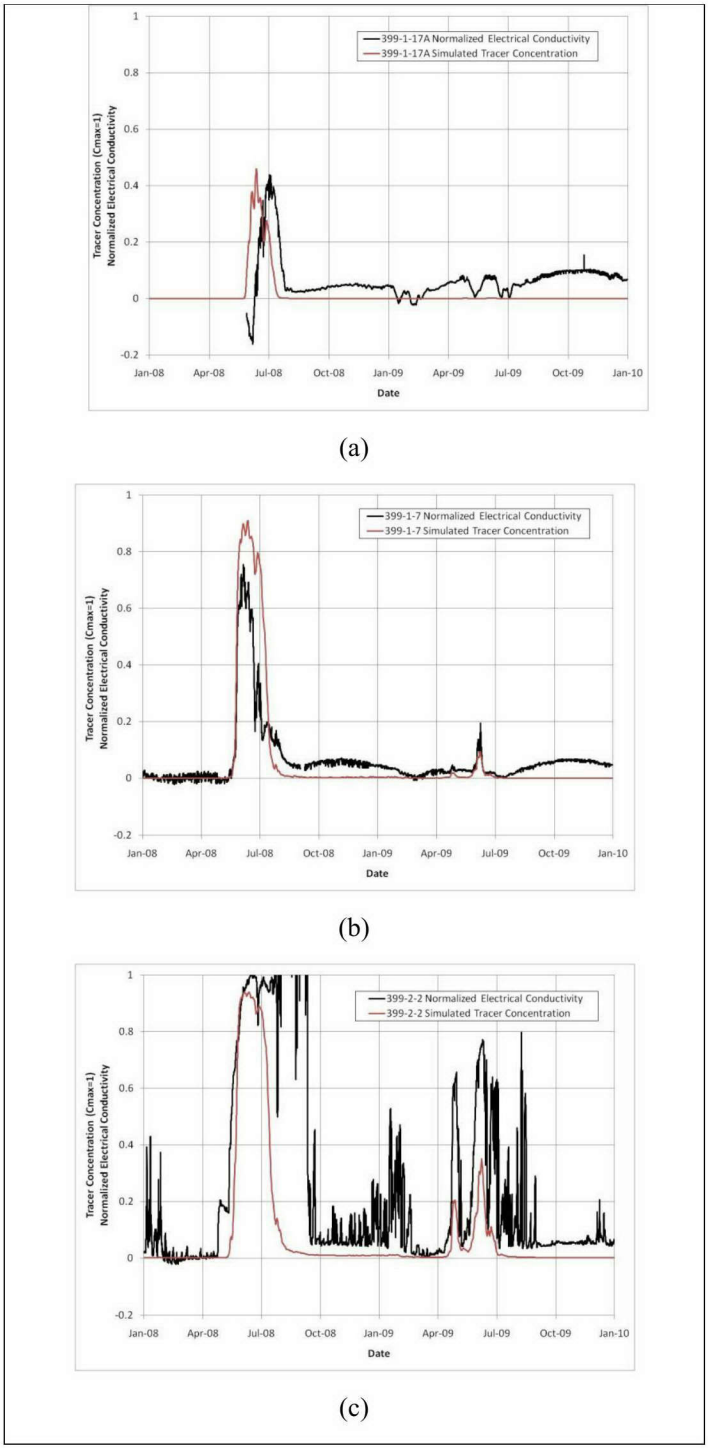


Figure 6-2. Simulated Tracer Concentration and Normalized Measured Electrical Conductivity during 2008 and 2009 at Wells: a) 399-1-17A, b) 399-1-7, and c) 399-2-2

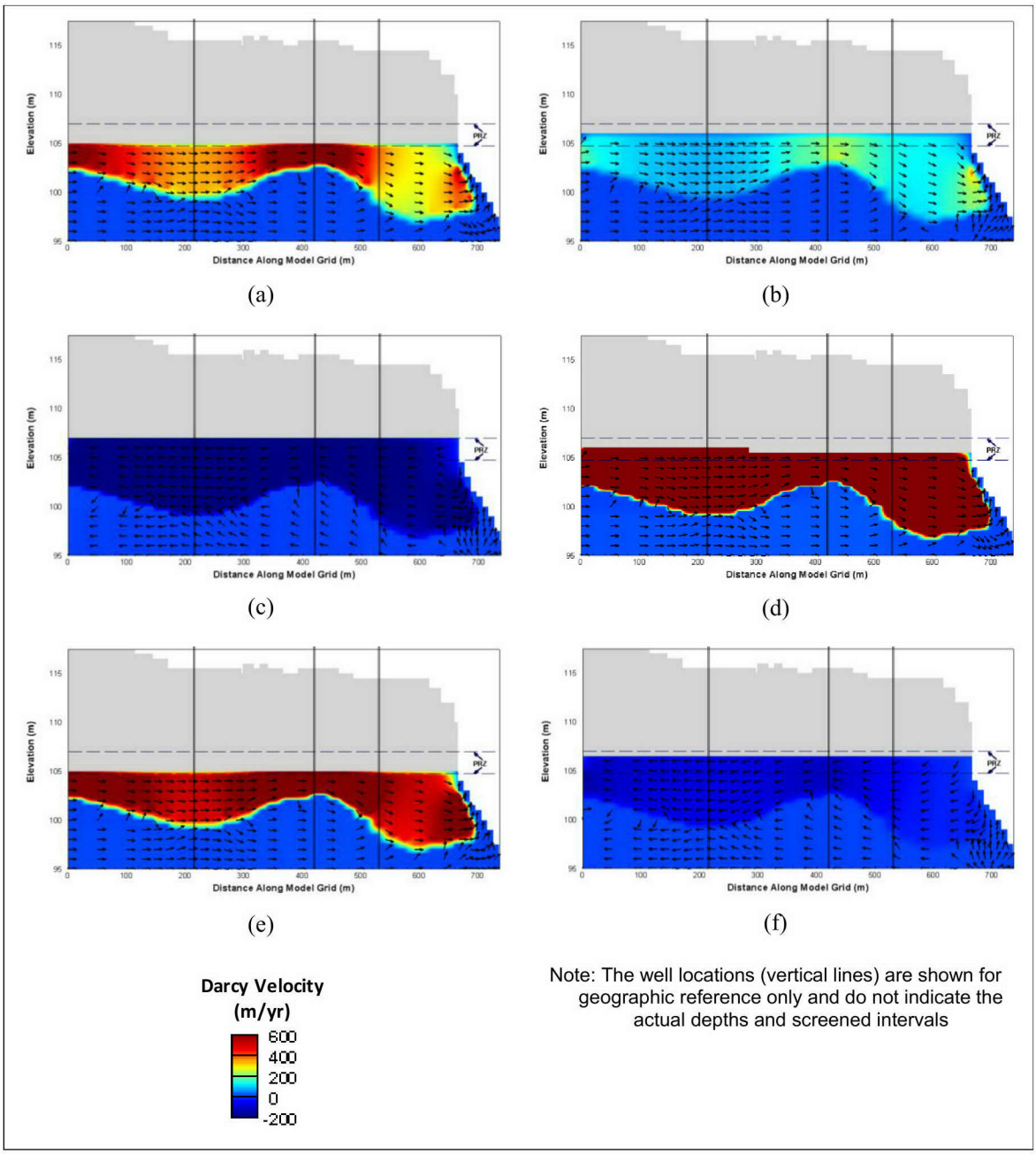


Figure 6-3. Simulated Darcy Groundwater Velocities along Model Grid at: a) Jan 2008, b) May 2008, c) June 2008, d) July 2008, e) March 2009, and f) June 2009

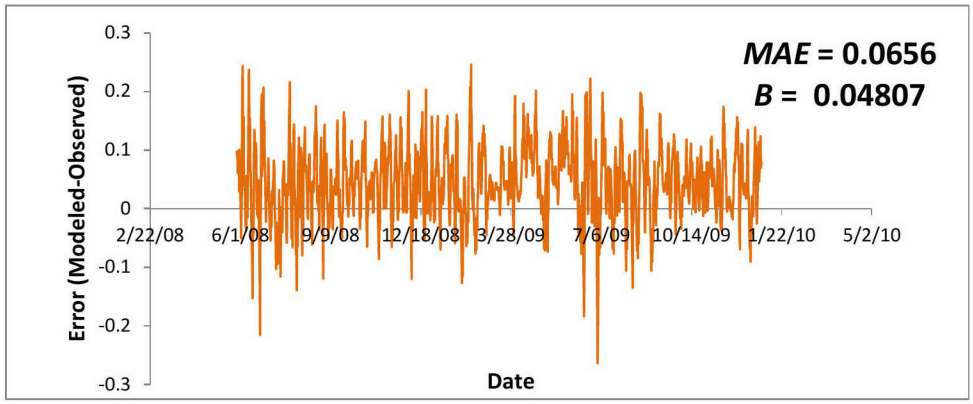
Table 6-1 lists the calibrated parameter values given the above considerations. Hydraulic conductivity of the Hanford formation of 9,000 m/day, hydraulic conductivity of the river alluvium of 10 m/day, and longitudinal dispersivity of the Hanford formation of 8.75 m provided a simulated breakthrough at 399-1-17A that was as close in time as possible to the observed breakthrough while exhibiting the overall shape and peak concentration of the observed breakthrough. The breakthrough response at the other wells is shown in Figure 6-2. The Hanford formation hydraulic conductivity of 9,000 m/day is within the range of estimates provided by others (Section 3.4.4.1). The river alluvium hydraulic conductivity of 10 m/day is close to and slightly higher than the upper value reported of 7 m/day (PNL-10285). The longitudinal dispersivity of the Hanford formation, 8.75 m, is higher than that reported by others (PNNL-17708; Yabusaki et al., 2008) but represents the value suggested by the Xu and Eckstein model (Xu and Eckstein, 1995; EPA, 2011) based on the plume travel distance (based on distance from Columbia River to well 399-1-17A).

Table 6-1. Final Model Parameters

Parameter	Hanford SZ/PRZ	Hanford VZ	Ringold E	Ringold Fine Grained	River Alluvium
Horizontal K (m/d)	9,000	9,000	42	1	10
K Anisotropy (K_z/K_x)	0.01	0.01	0.01	0.01	1.0
Diffusive Porosity (cm^3/cm^3)	0.167	0.167	0.177	0.177	0.177
Longitudinal Dispersivity, α_L (m)	8.75	0.875	1	1	1
Dispersivity Anisotropy, α_T/α_L	0.01	0.1	0.01	0.01	0.01
van Genuchten α (1/cm)	0.1	0.1	0.008	0.008	0.008
van Genuchten n (-)	1.725	1.725	1.66	1.66	1.66
Residual saturation (cm^3/cm^3)	0.132	0.132	0.147	0.147	0.147
Particle Density, ρ_P (g/cm^3)	2.68	2.68	2.65	2.65	2.76
Bulk Density, ρ_B (g/cm^3)	2.23	2.23	2.18	2.18	2.27

Secondary parameters that were calibrated include the anisotropy (vertical-to-horizontal) hydraulic conductivity ratio, the vadose zone longitudinal dispersivity, and the van Genuchten α parameter for the Hanford formation. These three parameters were modified so as to reduce the unreasonably high migration of river-tracer and uranium in the vadose zone down to an acceptable level. The transverse-to-longitudinal dispersivity ratio for the Hanford vadose zone changed from 0.01 to 0.1 since the transverse dispersivity was kept the same as the remainder of the Hanford formation while the longitudinal dispersivity was reduced by a factor of 10.

The calibrated model goodness-of-fit statistics (*MAE* and *B*), as defined in Section 0, were calculated and shown for hydraulic head in Figure 6-4 and for EC in Figure 6-5. The hydraulic head error shows extensive noise over time (Figure 6-4). The *MAE* for hydraulic head predictions is least at the most inland well (399-1-17A) and greater at wells closer to the river along the transect (399-1-7 and 399-2-2); the least bias in the predictions was exhibited for the well most central in the transect (399-1-7) with greater positive bias exhibited in the predictions at the wells closer to the inland and river side boundaries. For EC predictions, as might be expected the influence of the river water alkalinity is most pronounced closer to the river side boundary (Figure 6-5). EC predictions exhibit relatively low MAE and bias at the more



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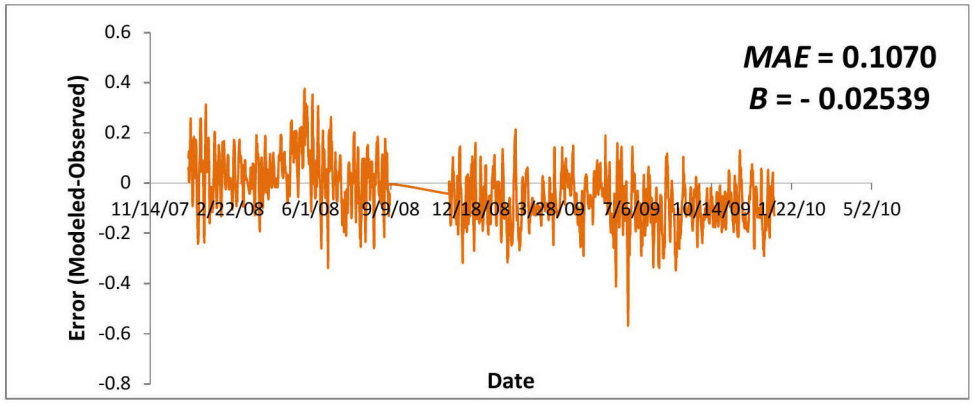

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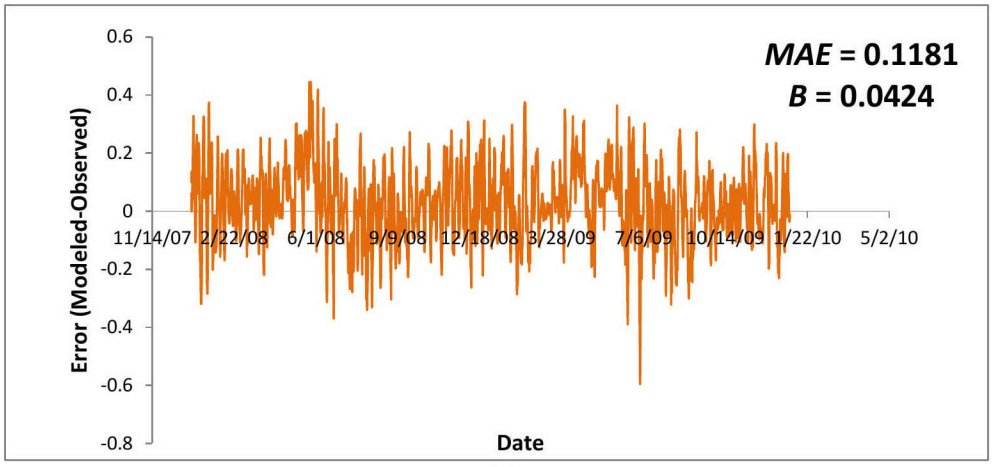
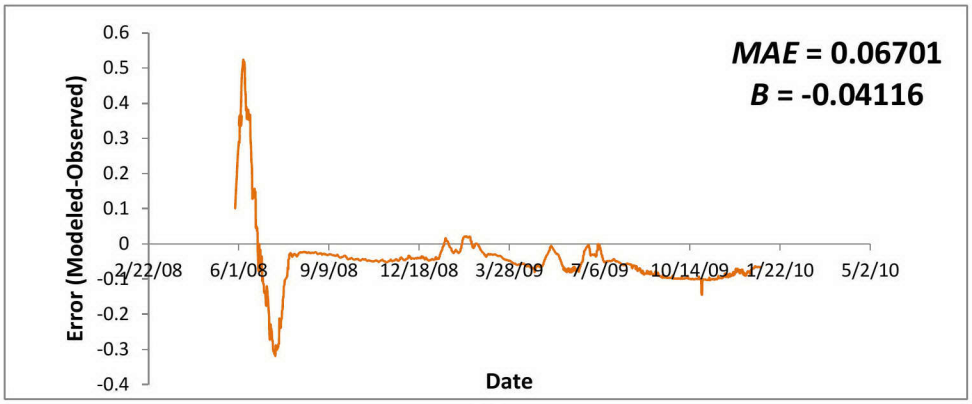


(c)

Figure 6-4. Calibrated Model Hydraulic Conductivity MAE and Bias for Wells: (a) 399-1-17A, (b) 399-1-7, and (c) Well 399-2-2



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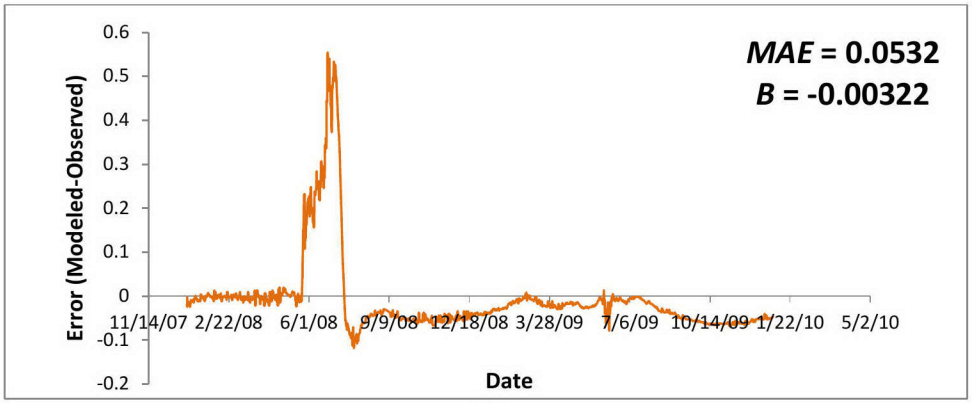

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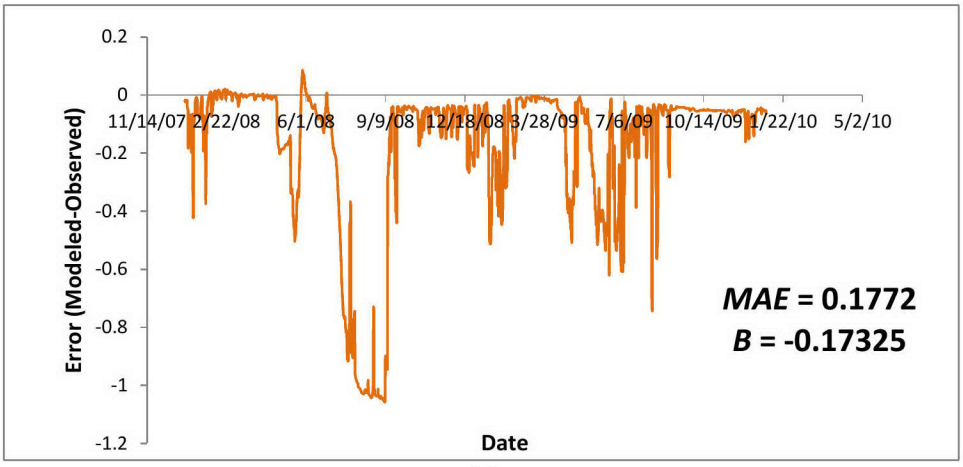


(c)

Figure 6-5. Calibrated Model EC (Normalized Electrical Conductivity) MAE and Bias for Wells: (a) 399-1-17A, (b) 399-1-7, and (c) 399-2-2

inland wells (399-1-17A and 399-1-7) but much greater MAE as well as bias at the well closest to the river side boundary (399-2-2), suggesting a limitation of the calibration in that the model is less predictive of EC nearer the river.

6.1.2 December-North Model

Simulated water levels compared favorably to measured water levels at each of the well locations used for the December-North model (Figure 6-6). As for the June-North model, comparison of river tracer breakthrough to normalized EC was better for wells closer to the river, 399-2-1, 399-2-5, and 399-3-18 (Figure 6-7a,b) and got worse for wells further from the river, 399-1-21A and 399-1-17A (Figure 6-7c,d). There are several possible reasons for the poor fit. First, as was suggested previously, some of the river water may, in reality, migrate towards wells at locations further inland along other paths (such as along the the June-North model transect) for part of the year rather than along the current transect. This is suspected as the main reason for little to no simulated river tracer showing up at well 399-1-17A (Figure 6-7d), approximetly 600 m from the river along the transect as it takes too long for tracer to migrate along the transect before the hydraulic gradient reverses back towards the river and the tracer never makes it that far.

Another possibilty for the simulated tracer not matching the measured tracer breakthrough at inland wells is that the geology of the December-North transect is heterogeneous in the plane perpendicular to the transect. In the December-North model Hanford formation thickness adjacent to the river is much less when compared to the June-North model. Instead, there is a thick portion of the Ringold fine grained unit (Figure 3-5) which, due to it's much lower conductivity, may partially prevent river water from flowing into the aquifer. In addition, the Hanford formation thickness increases inland from the river (Figure 3-5). This would cause groundwater velocities to decrease, effectively slowing down the migration of river water along an already increased flow path to the well (relative to the direct distance between the inland wells and the river). However, it must also be noted this may be because the selected transect was not sufficiently matched to the true flow path for the period simulated.

As a result of the deteriorating tracer concentration model fits with increased distance, it was decided that the December-North model was not a viable option for predicting uranium.

6.2 Alkalinity Model

The alkalinity in the Hanford formation varies with the influx of river water, which is a function of river stage (Figure 6-8), and recharging pore water from the vadose zone. The variable alkalinity was mapped into the equilibrium partitioning coefficient, K_d, for 29 time steps during the 2-year simulation period (Figure 5-1). The 29 different K_d distributions were used to update K_d in the STOMP input file for the equilibrium sorption, variable K_d uranium simulations.

With the simulated river-tracer breakthrough occurring earlier than the observed breakthrough at well 399-1-17A (Figure 6-2a), the timing of simulated high water level (Figure 6-1a) and river tracer are offset from the measured data. From inspection of the measured water levels and normalized EC at 399-1-17A (Figure 6-1a and Figure 6-2a), river EC reaches its peak near the end of the high water level period and several weeks after the water levels reach their maximum in June 2008. As a result, the aquifer water in contact with sorbed uranium at the top of the PRZ is exposed for longer duration to higher alkalinity groundwater that has a higher desorption rate than the river water. However, because the simulated river tracer breakthrough is earlier in time, reaching its peak at about the same time as do the high water levels, relatively less uranium at the top of the PRZ is expected to be desorbed and transported with the groundwater due to the lower desorption rates associated with the river water component.

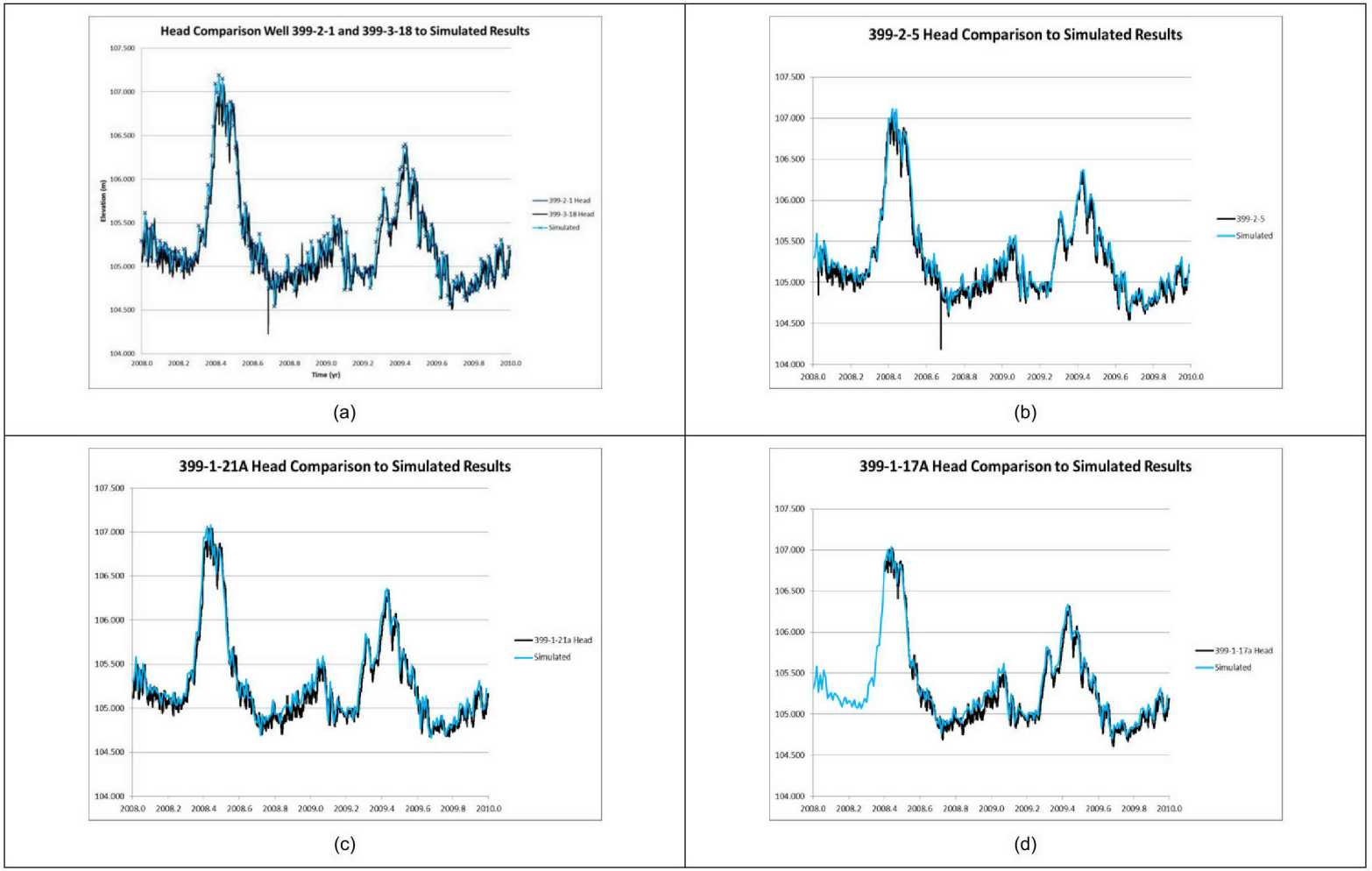
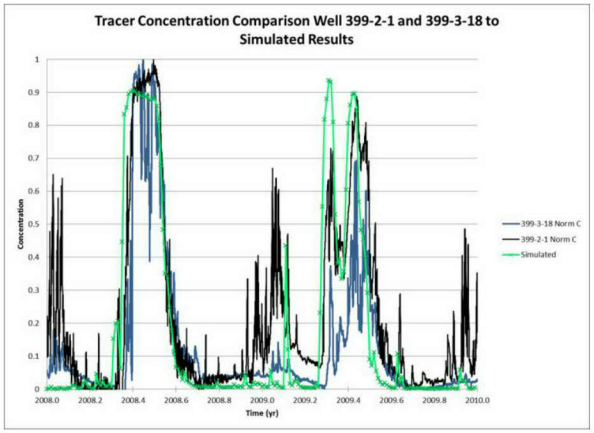


Figure 6-6. Simulated and Measured Water Levels for 2008 and 2009 at Wells: a) 399-2-1 and 399-3-18, b) 399-2-5, c) 399-1-21A, and d) 399-1-17A



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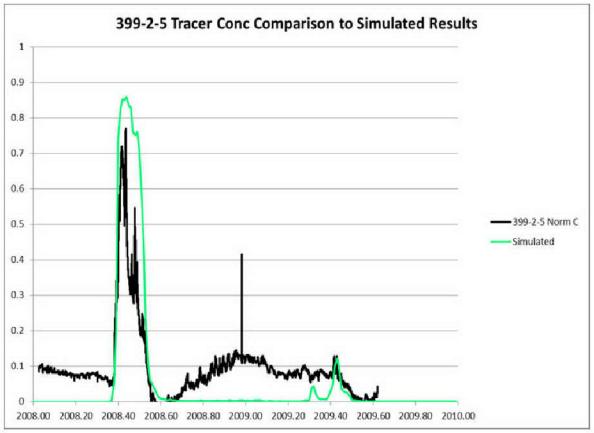

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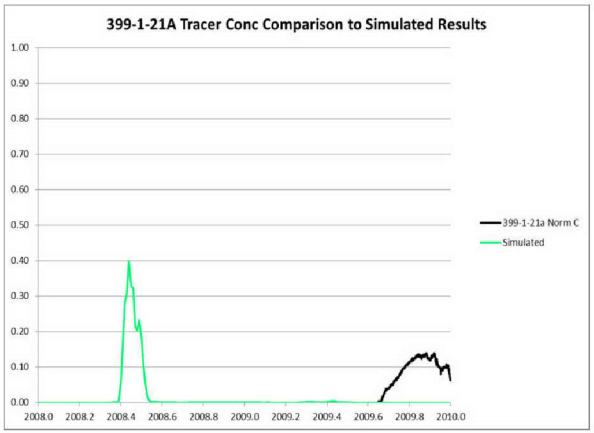

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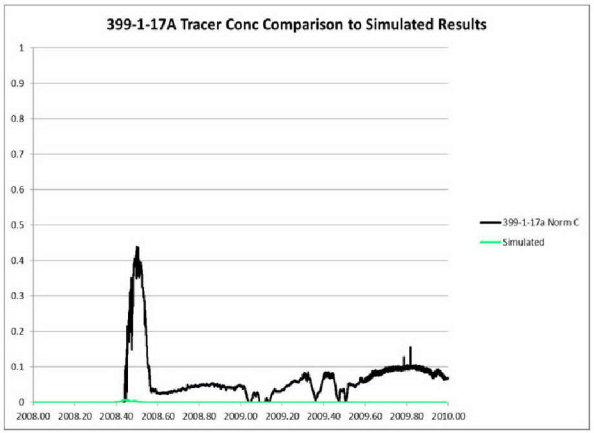


(d)

Figure 6-7. Simulated Tracer Concentration and Normalized Measured Electrical Conductivity for 2008 and 2009 at Wells: a) 399-2-1 and 399-3-18, b) 399-2-5, c) 399-1-21A, and d) 399-1-17A

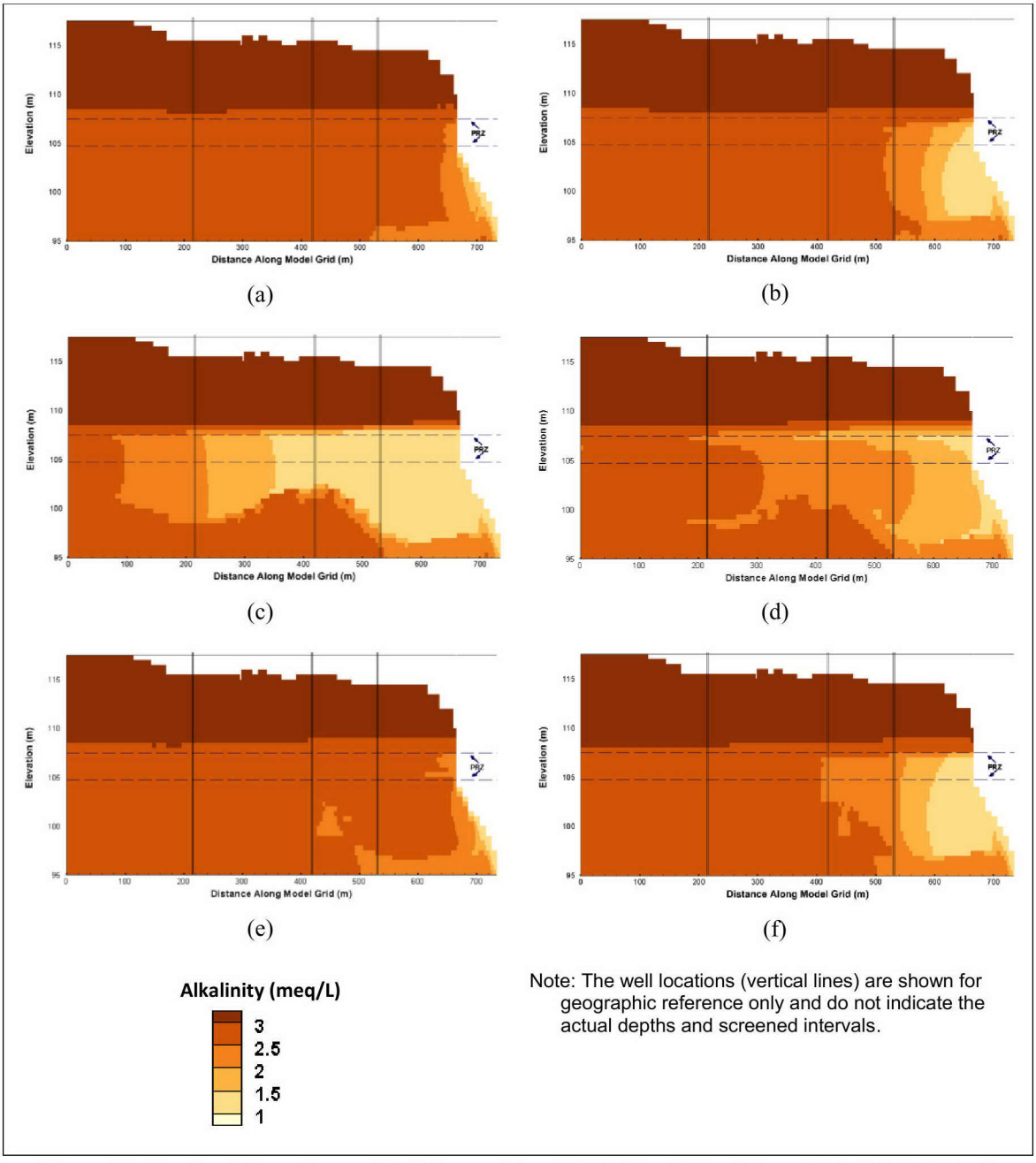


Figure 6-8. Simulated Groundwater Alkalinity at: a) Jan 2008, b) May 2008, c) June 2008, d) July 2008, e) March 2009, and f) June 2009

The slightly earlier arrival time of the simulated river water can result in lower desorption rates in the simulation for the equilibrium sorption, variable K_d model, over the time duration until the observed arrival time of river water. Because the time lag between the simulated and observed river-tracer breakthrough is small the overall effect on uranium desorption is likely to be insignificant. Furthermore, because the simulated river-tracer fraction declines earlier than the observed river-tracer fraction, these desorption rates would be higher in the simulation over the time duration until the observed river-tracer fraction declines. The two effects have the potential to cancel each other during the high water level period.

6.3 Uranium Model

6.3.1 Calibration

Calibration of the uranium model was performed by comparing uranium concentrations during the first 20 years of the simulation to measured uranium concentrations collected from 1992 through 2010 and adjusting the maximum initial uranium concentrations (labile fraction) to better match the early-time response. Initial concentrations (Section 3.5.2) were adjusted by setting all Ringold soil concentrations to zero and all saturated zone concentrations in the Hanford formation to background based on the assumption that the labile fraction would have been removed over many decades of pore volume flushing that has already occurred. The calibrated uranium model limited the maximum labile soil concentrations to less than 15 μg/g (on a bulk volume basis) because higher values were demonstrated to yield unrealistically high uranium concentrations.

The simulated uranium groundwater concentrations during the calibration period are presented in Figure 6-9 and Figure 6-10. Figure 6-9 compares the simulation concentrations for all five transport models to the measured data for wells 399-1-12, 399-1-17A, 399-1-7, 399-2-2, and 399-2-1. The results for well 399-1-17A (Figure 6-7b) are further broken out by each simulation in Figure 6-10.

These plots show how the transport model mimics the observed increases in the uranium groundwater concentrations during the typically high water month of June (evident as the peaks in Figure 6-10). These simulation results show that the equilibrium model with the spatially and temporally varying distribution coefficient ("variable K_d") and the kinetic model with the groundwater end-member alkalinity value ("kinetic GW") best mimic the observed uranium groundwater concentrations (Figure 6-10c and d), especially during the last five years of the simulation time frame (2007 to 2011). In addition, the model results show that during the typical high-water month of June, the uranium groundwater concentrations increase at the inland wells (Figure 6-9a and b), and decrease at the wells near the river (Figure 6-9c, d, and e). This behavior in the inland wells is a result of the rising water levels coming in contact with uranium mass within the upper portions of the PRZ, and capillary fringe, near the southern end of the 300 Area Process Trench, thereby increasing desorption from the soil to the aqueous phase and increasing concentrations in the groundwater. As the water levels decrease, the higher groundwater concentrations decrease due to mixing and dilution with the relatively large groundwater velocity within the 300 Area. The decrease in uranium groundwater concentrations for the wells near the river is due to a combination of dilution and lowering alkalinity, and thus decreased desorption, from the influx of river water.

6.3.2 No-Action Scenario

The variable K_d and the kinetic GW model simulations were extended for another 180 years, out to year 2191, to provide an estimate of when the uranium groundwater concentrations would drop below the groundwater MCL regulatory standard of 30 μg/L for a no-action modeling scenario. Uranium groundwater concentrations for the no-action scenario are presented for the five sorption models for the

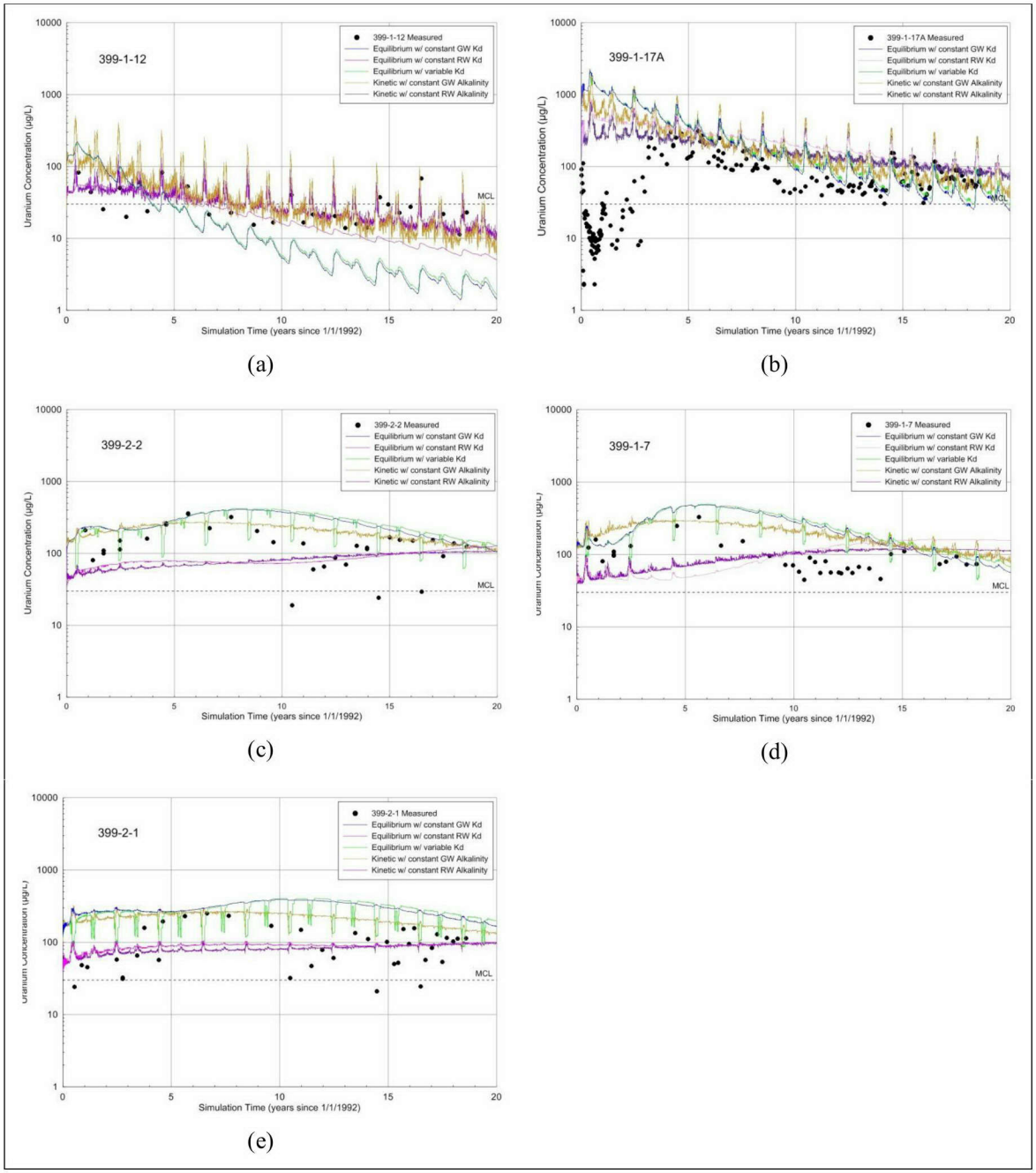


Figure 6-9. Measured and Simulated Groundwater Uranium Concentrations during the Calibration Period at Wells: a) 399-1-12, b) 399-1-17A, c) 399-1-7, d) 399-2-2, and e) 399-2-1

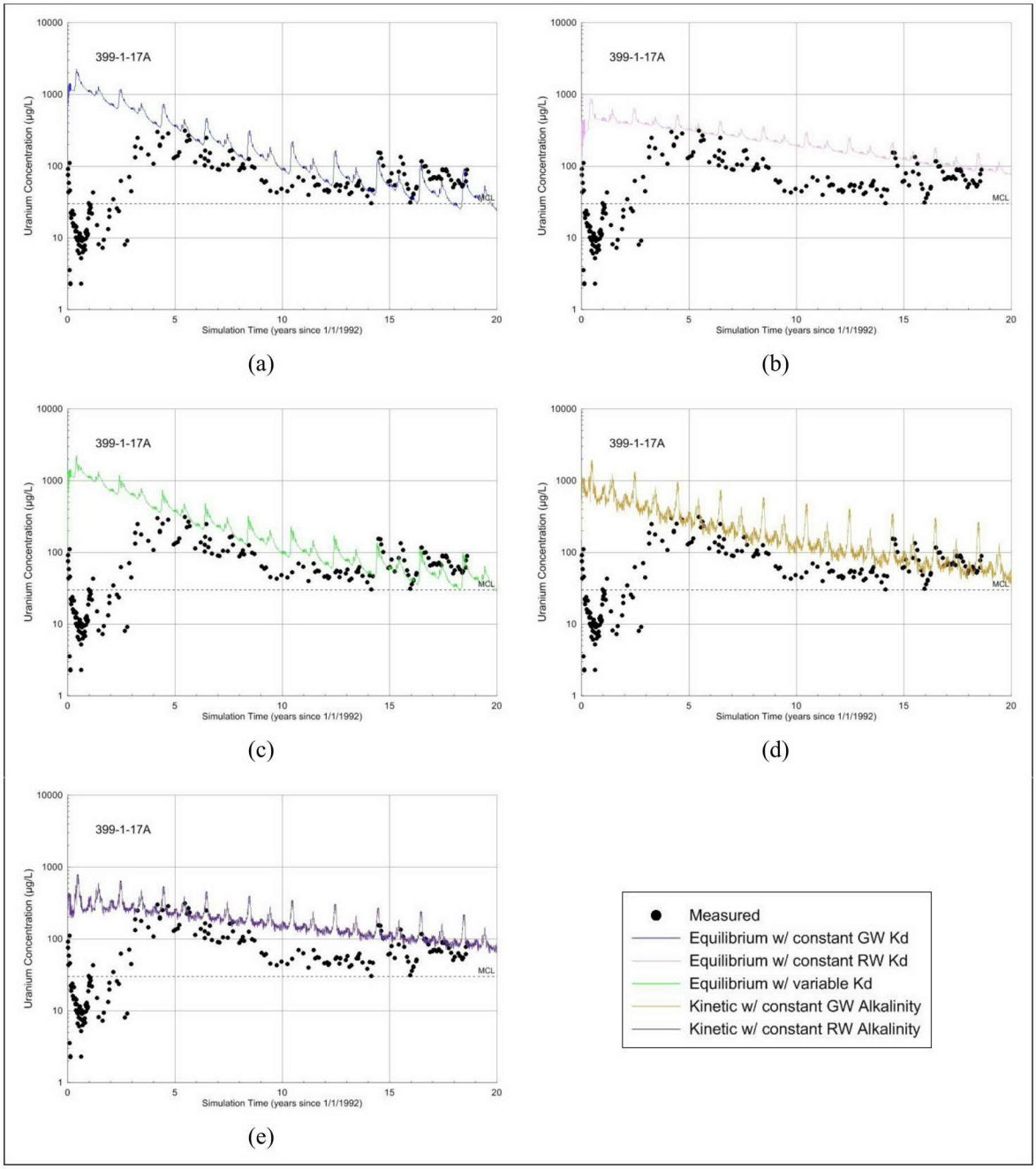


Figure 6-10. Measured and Simulated Groundwater Uranium Concentrations during the Calibration Period at Well 399-1-17A

four monitoring wells (Figure 6-11 through Figure 6-14). The cyclic nature of the concentrations is evident where the peak concentrations represent high water levels in the aquifer resulting from high river stage and resulting interaction of groundwater with the higher-concentration soils at the top of the PRZ. The initial portion of the time series at 399-1-17A (Figure 6-12) where concentrations are seen to drop off most steeply represents dissolution of uranium sorbed to the soil within the PRZ and the saturated zone. At ~40 years for the equilibrium sorption model and ~70 years for the kinetic sorption model the rate of decline in groundwater concentrations decreases at an exponentially decaying rate. This later-time portion of the time series represents loading from the vadose zone which declines slowly over time as the uranium sources in the vadose zone are depleted. Wells 399-1-7 and 399-2-2 are downgradient from the highly contaminated zone near well 399-1-17A. Concentrations at these wells (Figure 6-13 and Figure 6-14) initially increase due to the higher uranium concentrations generated in the vicinity of 399-1-17A, with subsequent decreasing concentrations reflecting the depletion of the upgradient sources as well as depletion of the closer less-contaminated soils (Figure 3-19). Well 399-1-12 is upgradient of the highly contaminated zone in the vicinity of 399-1-17A. As such, the concentrations at 399-1-12 represent migration of dissolved uranium inland along the transect during periods of high river stage and resulting inland hydraulic gradient.

Additional results from the no action simulations include:

- Simulated uranium concentrations for the kinetic sorption model exhibited a much larger fluctuation (range in predicted uranium concentrations) than for the equilibrium sorption model;
- Concentrations decrease more rapidly for the equilibrium sorption model than for the kinetic sorption model. This result from the kinetic sorption model having a higher sorption rate than desorption rate, and that sorption/desorption in the kinetic model is rate-limited whereas sorption is instantaneous for the equilibrium model.
- Well 399-1-12 is located upgradient of all of the surface uranium sources in the model (but exhibits groundwater contamination from inland migration). Uranium concentrations drop below MCL within 5 years and 50 years for the equilibrium and kinetic sorption models, respectively;
- Well 399-1-17A is within the higher uranium concentration zone in the model. Concentrations drop below MCL at 170-180 years for the equilibrium sorption model. Concentrations are still above MCL at 200 years for the kinetic sorption model;
- At well 399-1-7, uranium concentrations drop below MCL at 45 and 120 years for the equilibrium and kinetic sorption models, respectively;
- At well 399-2-2, uranium concentrations drop below MCL at 53 and 70 years for the equilibrium and kinetic sorption models, respectively.

The effect of high water levels due to high river stage is increased interaction of groundwater with more highly-contaminated soils in the upper portion of the PRZ. This interaction provides a mechanism for transport of dissolved uranium from uranium source zones into the saturated zone creating a groundwater uranium plume (Figure 6-15). The effect is larger (greater concentrations) for 2008 (Figure 6-15c) due to the higher water levels observed in summer 2008 (Figure 3-6). The water levels observed in summer 2009 (Figure 3-6) also generate higher groundwater uranium concentrations (Figure 6-15f) but the effect is not as noticeable as in summer 2008 and the plume size and magnitude of concentrations is less.

Low water levels observed during the non-summer months are times when the hydraulic gradient is generally towards the river. During these times less uranium is introduced into the saturated zone and

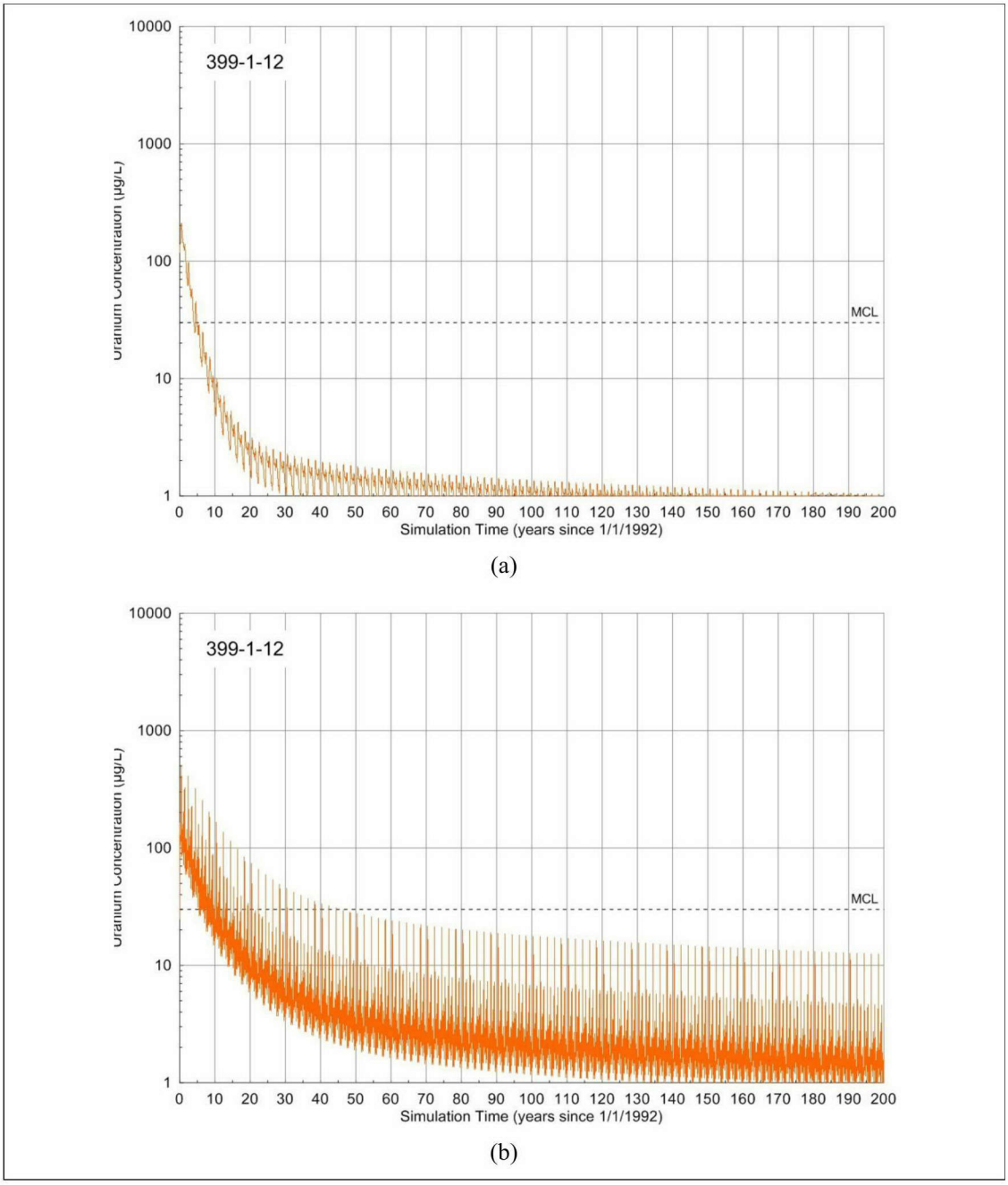


Figure 6-11. Simulated Groundwater Uranium Concentrations at well 399-1-12 for the No-Action Scenario from the (a) Equilibrium Sorption Model (Spatially Variable K_d) and (b) Kinetic Sorption Model (GW Alkalinity)

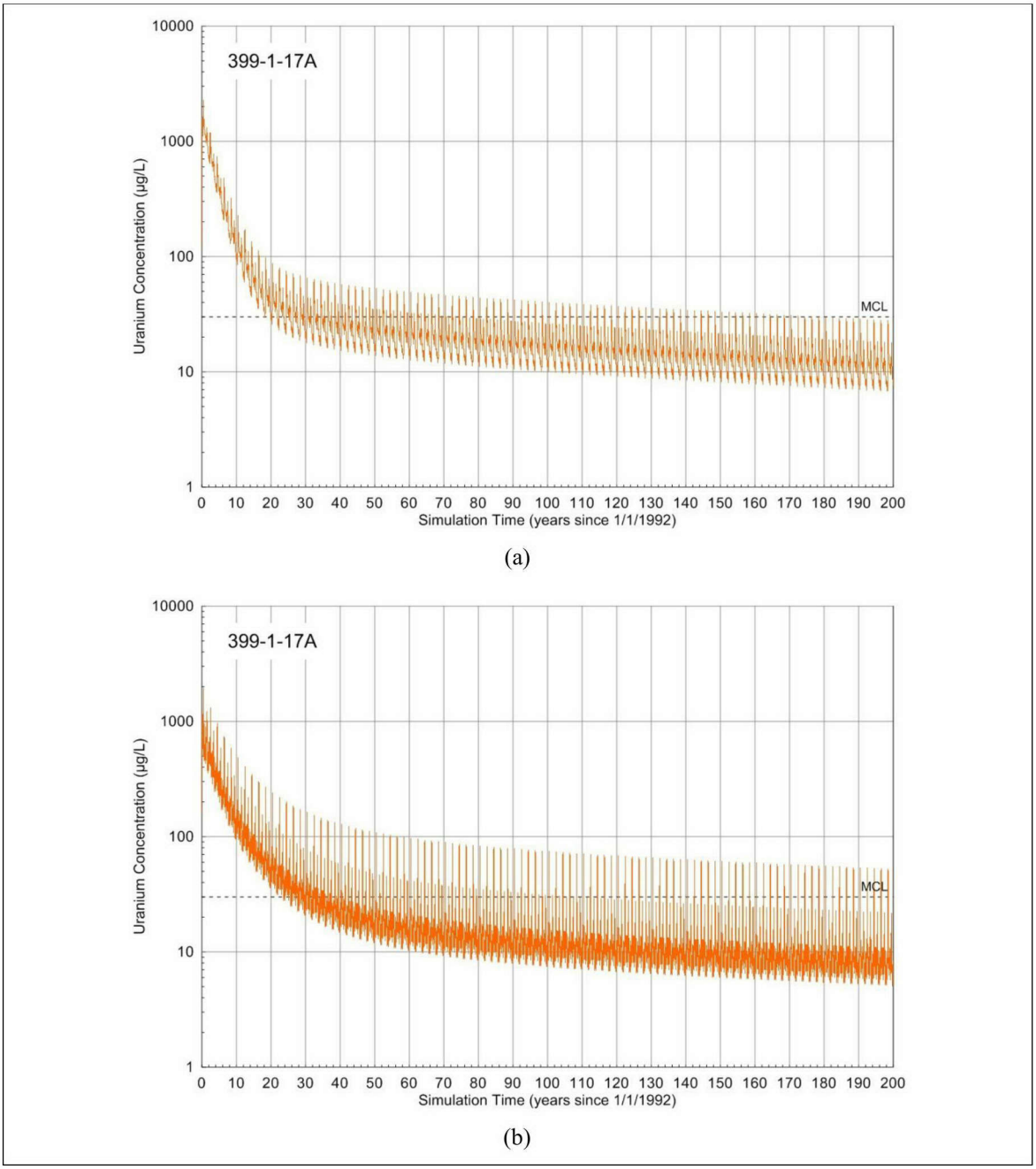


Figure 6-12. Simulated Groundwater Uranium Concentrations at Well 399-1-17A for the No-Action Scenario from the (a) Equilibrium Sorption Model (Spatially Variable K_d) and (b) Kinetic Sorption Model (GW Alkalinity)

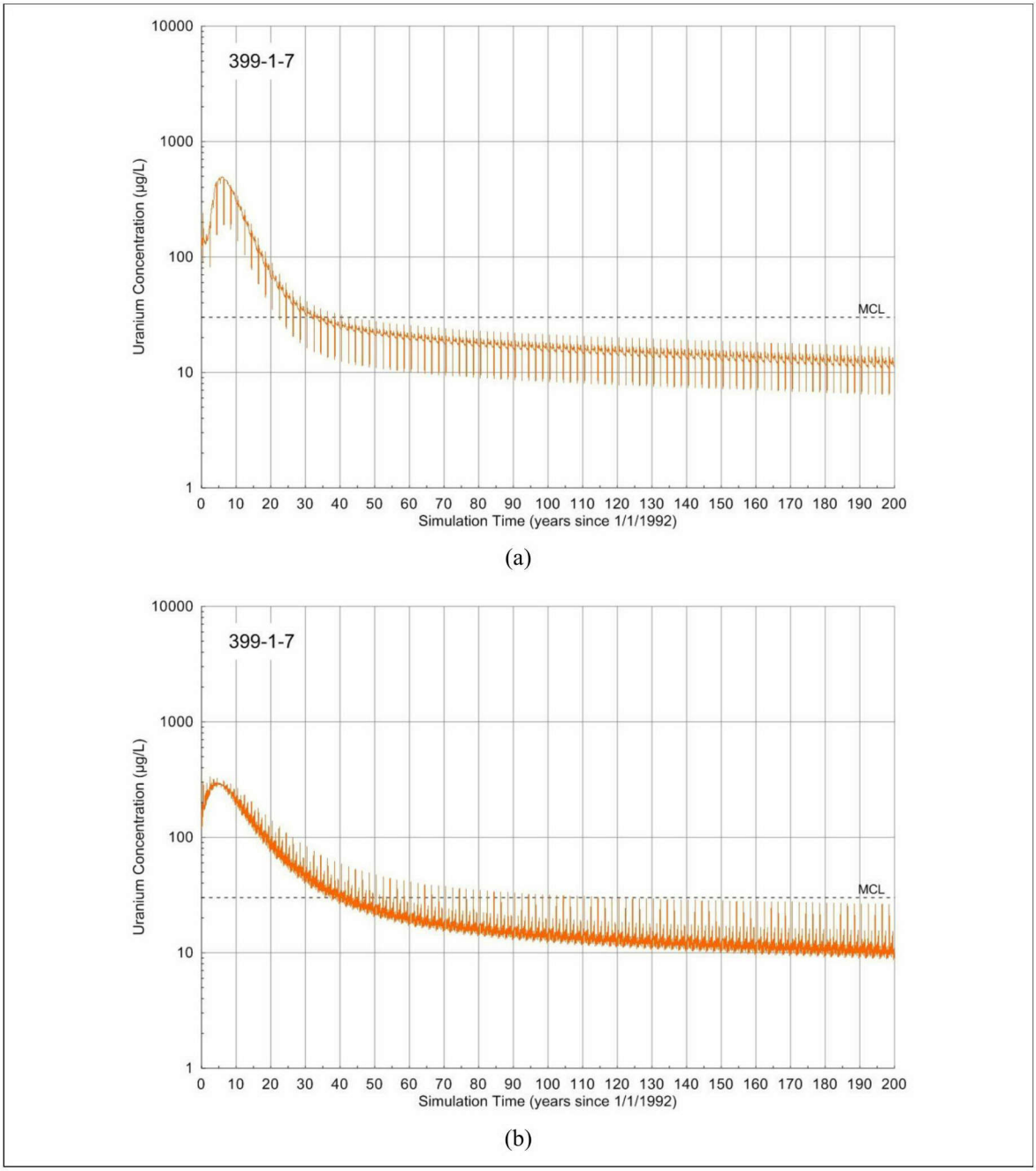


Figure 6-13. Simulated Groundwater Uranium Concentrations at Well 399-1-7 for the No-Action Scenario from the (a) Equilibrium Sorption Model (Spatially Variable K_d) and the (b) Kinetic Sorption Model (GW Alkalinity)

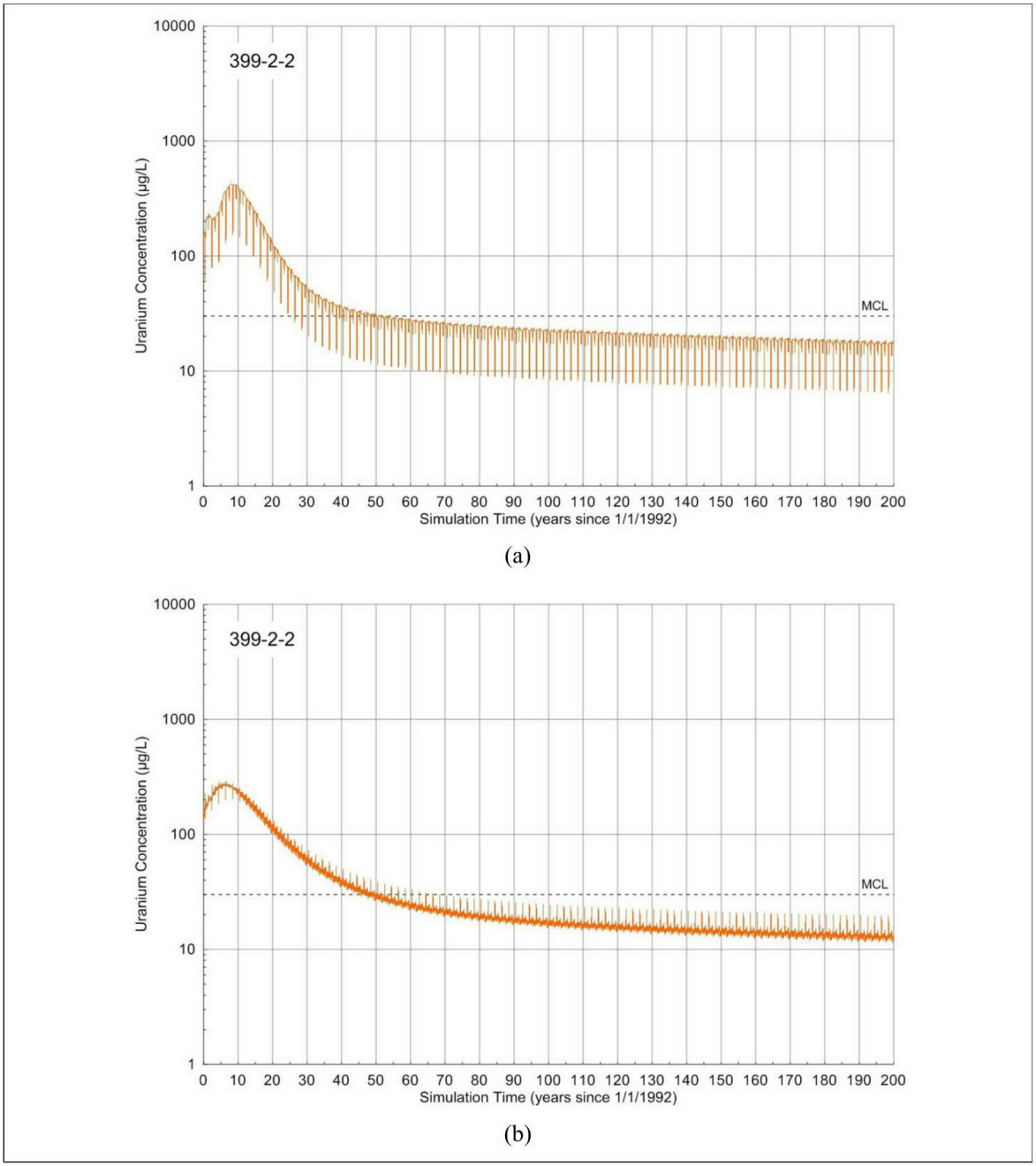


Figure 6-14. Simulated Groundwater Uranium Concentrations at Well 399-2-2 for the No-Action Scenario from the (a) Equilibrium Sorption Model (Spatially Variable K_d) and (b) Kinetic Sorption Model (GW Alkalinity)

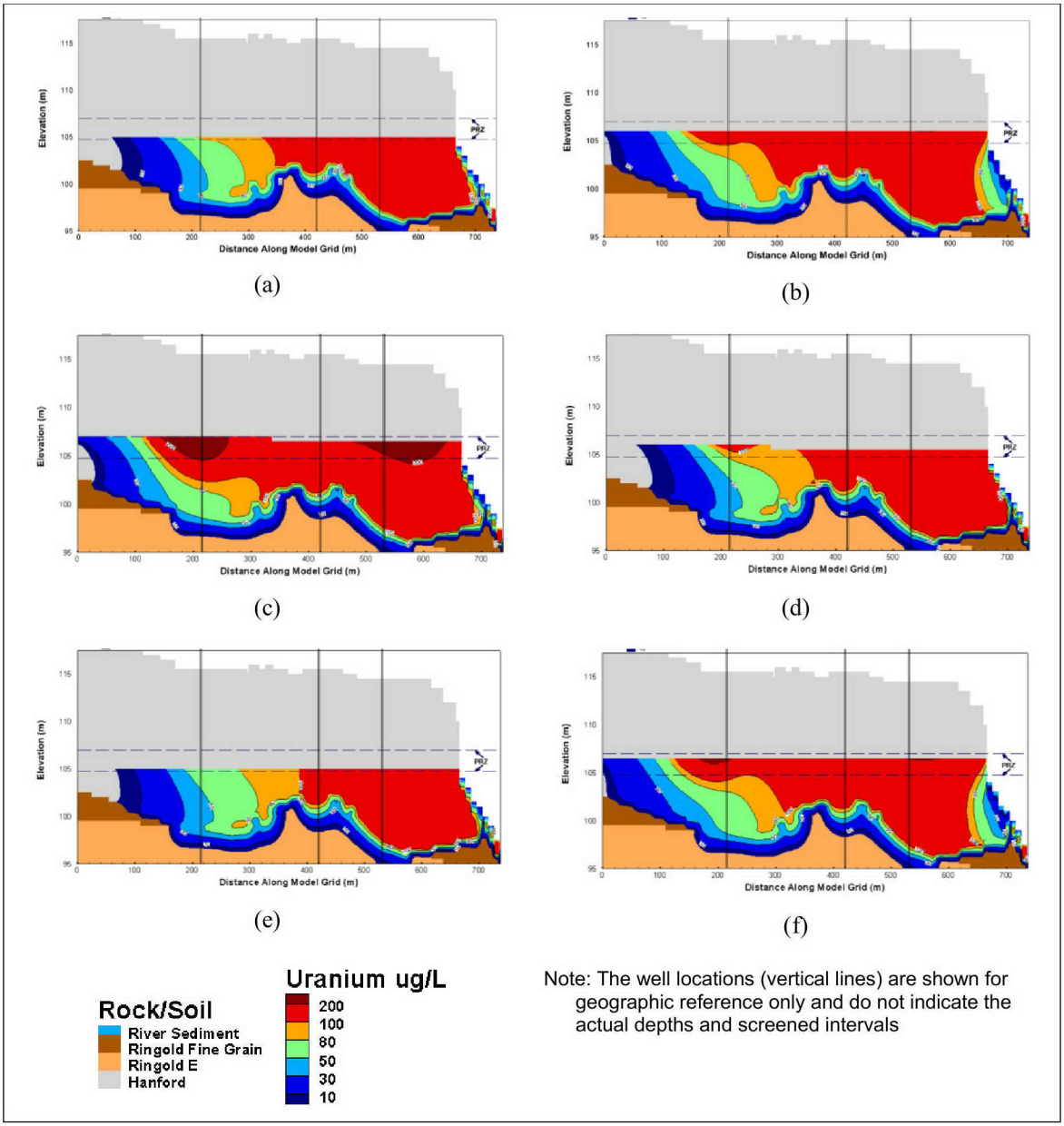


Figure 6-15. Simulated Groundwater Uranium Concentrations for Kinetic Sorption Model (GW Alkalinity): a) Jan 2008, b) May 2008, c) June 2008, d) July 2008, e) March 2009, and f) June 2009

uranium concentrations in the aquifer decrease as it migrates towards the river (Figure 6-15a, b, d, and e). Depletion of the sorbed uranium occurs most rapidly in regions of the model that exhibit the largest contact time with groundwater (Figure 6-16). The highest initial soil uranium sources located in the PRZ are depleted at a much higher rate than those in the vadose zone because of the soil flushing effect in the PRZ. As a result, the remaining uranium in the vadose zone acts as a long term source to groundwater contamination (Figure 6-16c and d).

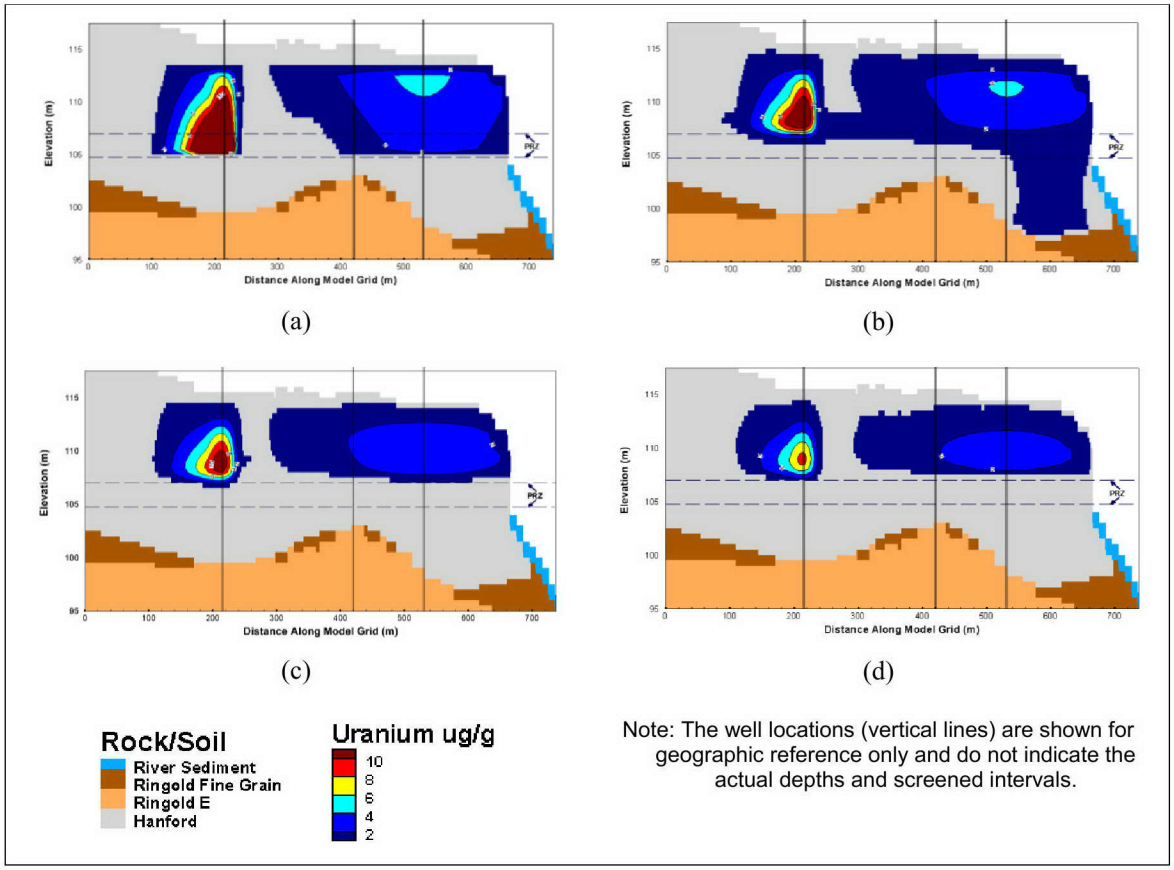


Figure 6-16. Simulated Soil Uranium Concentrations for Kinetic Sorption Model (GW Alkalinity): a) 1992 (t=0 yr), b) 2012 (t=20 yr), c) 2062 (t=70 yr), and d) 2192 (t=200 yr)

6.4 Remedial Alternatives

Following evaluation of the no-action model results, the equilibrium sorption, spatially variable K_d model and the kinetic sorption, groundwater alkalinity model were chosen as the models most representative of transport behavior of uranium in the system and these two models were used to evaluate the RA scenarios. Model uncertainty (discussed in Section 6.6) must be kept in mind with regard to the reliability of the results presented for the evaluation of these RA scenarios. The results presented here are considered adequate to their intended purpose to select between RAs. The results are not, however, considered accurate enough given the uncertainty mentioned to predict cleanup goal attainment to, for instance, a specific calendar year. The modified initial soil uranium concentrations for the ten RA scenarios (defined in Section 5.3) are presented in Figure 6-17 and Figure 6-18. The predicted groundwater uranium concentrations for both sorption models at well 399-1-12 are presented in Figure 6-19 and Figure 6-20 for each RA scenario. The results shown in Figure 6-19b and Figure 6-20b for the kinetic sorption model using the groundwater alkalinity is further broken out in Figure 6-21 and Figure 6-22, respectively. Similar results for the wells 399-1-17A, 399-1-7, and 399-2-2 are presented in Figure 6-23 through Figure 6-34.

The overall results of the RA simulations are summarized as:

- Treatment of the PRZ (RA 1) and the PRZ and SZ (RA 2) has limited effect on groundwater uranium concentrations. Initially there is a marked decrease in concentrations, especially for RA 2, however the concentrations rebound back to pre-treatment concentrations within approximately 30 years following implementation at all wells. This indicates that the primary source of uranium to the saturated zone is from the vadose zone above the PRZ.
- The implementation of the ET barrier (RA 5) does not reduce the uranium soil concentrations however the contaminant flux to the saturated zone is reduced. This reduction results in the maximum uranium groundwater concentration at well 399-1-17A (Figure 6-25e) to drop below MCL at approximately 150 years following implementation of the ET barrier.
- The remaining alternatives incorporate decreasing amounts of uranium soil contamination and thus a reduction in the vadose zone loading to the saturated zone due to the phosphate sequestration treatment and/or the deep excavation from the VZ and PRZ. As the amount of mass is reduced, the time for the groundwater uranium concentrations to drop below the MCL is also reduced. The maximum uranium groundwater concentrations simulated at well 399-1-17A shows a decrease from approximately 150 years post implementation (RA 4; Figure 6-25d) down to 6 years post implementation (RA 9; Figure 6-26d).

The cyclic nature of the simulated groundwater concentrations over a two year period shows two high-concentration periods, corresponding to the yearly high-water level periods, at concentrations significantly greater than the simulated concentrations during the remainder of the two-year period. To aid in the feasibility study analysis of the RAs, the time at which the simulation concentration drops below the MCL was determine based on four different concentration metrics: 1) maximum concentration, 2) the calculated mean concentration, and 3) the calculated 90th percentile for the concentration; and 4) the calculated 95th percent upper confidence limit (UCL). The selected metrics result in time frames that can be significantly different and thus impact the feasibility study results of the RAs.

Assuming a two-year window, which corresponds to the repeating two-year hydraulic boundary condition cycle implemented within the flow model, the maximum, mean, 90th percentile and 95th UCL concentrations were calculated using all the simulated values within the two-year window. This resulted in a maximum, mean, 90th percentile and 95th UCL data value for each two-year cycle, with the data value assigned to the mid-point time of the two-year cycle.

Figure 6-35 presents the simulated concentration along with the maximum, mean, 90th percentile and 95th UCL concentrations with time shown for the No-Action scenario at wells 399-1-17A, 399-1-7, and 399-2-2 under the native vegetation recharge scenario. This plot shows that the time to MCL is significantly less for the mean, 90th percentile and 95th UCL concentration values than for the maximum concentration value. Table 6-2 lists the overall simulation time to MCL, the corresponding number of years from the start of remediation (simulation year 21), and the equivalent calendar year for both the native vegetation and industrial recharge scenarios.

Figure 6-36 presents the 90th percentile concentration curves for the No-Action scenario and RA 6 through RA 9 for wells 399-1-17A, 399-1-7, and 399-2-2 under the native vegetation recharge scenario. This figure is limited to a single statistic in order to compare and contrast multiple wells; all statistics are shown in subsequent figures. The subset of RAs displayed focuses on those most of interest to the FS in progress.

Figure 6-37 presents the maximum, mean, 90th percentile and 95th UCL concentration curves for Well 399-1-17A for RA 6, RA 8, RA 9 and RA 10 under the native vegetation recharge scenario.

Figure 6-38 presents the maximum, mean, 90th percentile and 95th UCL concentration curves for Well 399-1-7 for RA 6, RA 8, RA 9 and RA 10 under the native vegetation recharge scenario.

Figure 6-39 presents the maximum, mean, 90th percentile and 95th UCL concentration curves for Well 399-1-2 for RA 6, RA 8, RA 9 and RA 10 under the native vegetation recharge scenario.

The results presented for the native vegetation scenario are not shown in the same level of detail here for the industrial recharge scenario. The responses of the model under the industrial recharge scenario are are very similar, but with slightly faster reduction to MCL levels than for the native vegetation scenario. The results are summarized for both recharge scenarios in Table 6-2 which lists the times to MCL under each statistic (maximum, mean, 90th percentile, and 95th UCL) under each recharge scenario at wells 399-1-17A, 399-1-7, and 399-2-2. Times to MCL vary by well in response to spatially and temporally variable conditions in the model, and the most restrictive result of the three-well set determines when the MCL is reached for the system as a whole.

In general, the times to MCL listed in Table 6-2 are less under the industrial recharge scenario than for the native vegetation recharge scenario; this result that might appear contradictory. However, this is consistent with the selection of the most conservative case under the native vegetation scenario (extended recharge scenario; discussed in Section 6.5) which actually results in a higher recharge rate until the peak is reached than for the industrial recharge scenario. Had a less conservative case for the native recharge scenario been selected as the PRG basis, this would not have been the case.

Table 6-2. Time for the Maximum, 95th UCL, 90th Percentile, and Mean of the Simulated Groundwater Uranium Concentration to Drop Below Maximum Contaminant Level for No-Action Scenario and Remedial Alternatives 6 through 10 for the Native Vegetation and Industrial Recharge Scenarios

Statistic	Case	Recharge Scenario	Simulation Time for Concentration to Reach MCL			Number of Years(1) for Concentration to Reach MCL			Calendar Year for Concentration to Reach MCL		
			399-1-17A	399-1-7	399-2-2	399-1-17A	399-1-7	399-2-2	399-1-17A	399-1-7	399-2-2
Maximum	No Action	Native Veg	>200	120	68	>180	100	48	>2191	2111	2059
		Industrial	>200	65	52	>180	45	32	>2191	2056	2043
	RA 6	Native Veg	156	46	42	136	26	22	2147	2037	2033
		Industrial	76	42	38	56	22	18	2067	2033	2029
	RA 7	Native Veg	38	34	34	18	14	14	2029	2025	2025
		Industrial	34	34	33	14	14	13	2025	2025	2024
	RA 8	Native Veg	28	36	34	8	16	14	2019	2027	2025
		Industrial	28	35	33	8	15	13	2019	2026	2024
	RA 9	Native Veg	26	30	32	6	10	12	2017	2021	2023
		Industrial	25	30	31	5	10	11	2016	2021	2022
	RA 10	Native Veg	>200	60	48	>180	40	28	>2191	2051	2039
		Industrial	146	48	43	126	28	23	2137	2039	2034

Table 6-2. Time for the Maximum, 95th UCL, 90th Percentile, and Mean of the Simulated Groundwater Uranium Concentration to Drop Below Maximum Contaminant Level for No-Action Scenario and Remedial Alternatives 6 through 10 for the Native Vegetation and Industrial Recharge Scenarios

Statistic	Case	Recharge Scenario	Simulation Time for Concentration to Reach MCL			Number of Years(1) for Concentration to Reach MCL			Calendar Year for Concentration to Reach MCL		
			399-1-17A	399-1-7	399-2-2	399-1-17A	399-1-7	399-2-2	399-1-17A	399-1-7	399-2-2
95th UCL	No Action	Native Veg	49	47	51	29	27	31	2040	2038	2042
		Industrial	36	40	45	16	20	25	2027	2031	2036
	RA 6	Native Veg	28	32	36	8	12	16	2019	2023	2027
		Industrial	26	33	35	6	13	15	2017	2024	2026
	RA 7	Native Veg	--	--	--	--	--	--	--	--	--
		Industrial	23	28	31	3	8	11	2014	2019	2022
	RA 8	Native Veg	21	28	32	1	8	12	2012	2019	2023
		Industrial	21	28	31	1	8	11	2012	2019	2022
	RA 9	Native Veg	21	26	30	1	6	10	2012	2017	2021
		Industrial	21	26	28	1	6	8	2012	2017	2019
	RA 10	Native Veg	36	36	40	16	16	20	2027	2027	2031
		Industrial	30	35	38	10	15	18	2021	2026	2029

Table 6-2. Time for the Maximum, 95th UCL, 90th Percentile, and Mean of the Simulated Groundwater Uranium Concentration to Drop Below Maximum Contaminant Level for No-Action Scenario and Remedial Alternatives 6 through 10 for the Native Vegetation and Industrial Recharge Scenarios

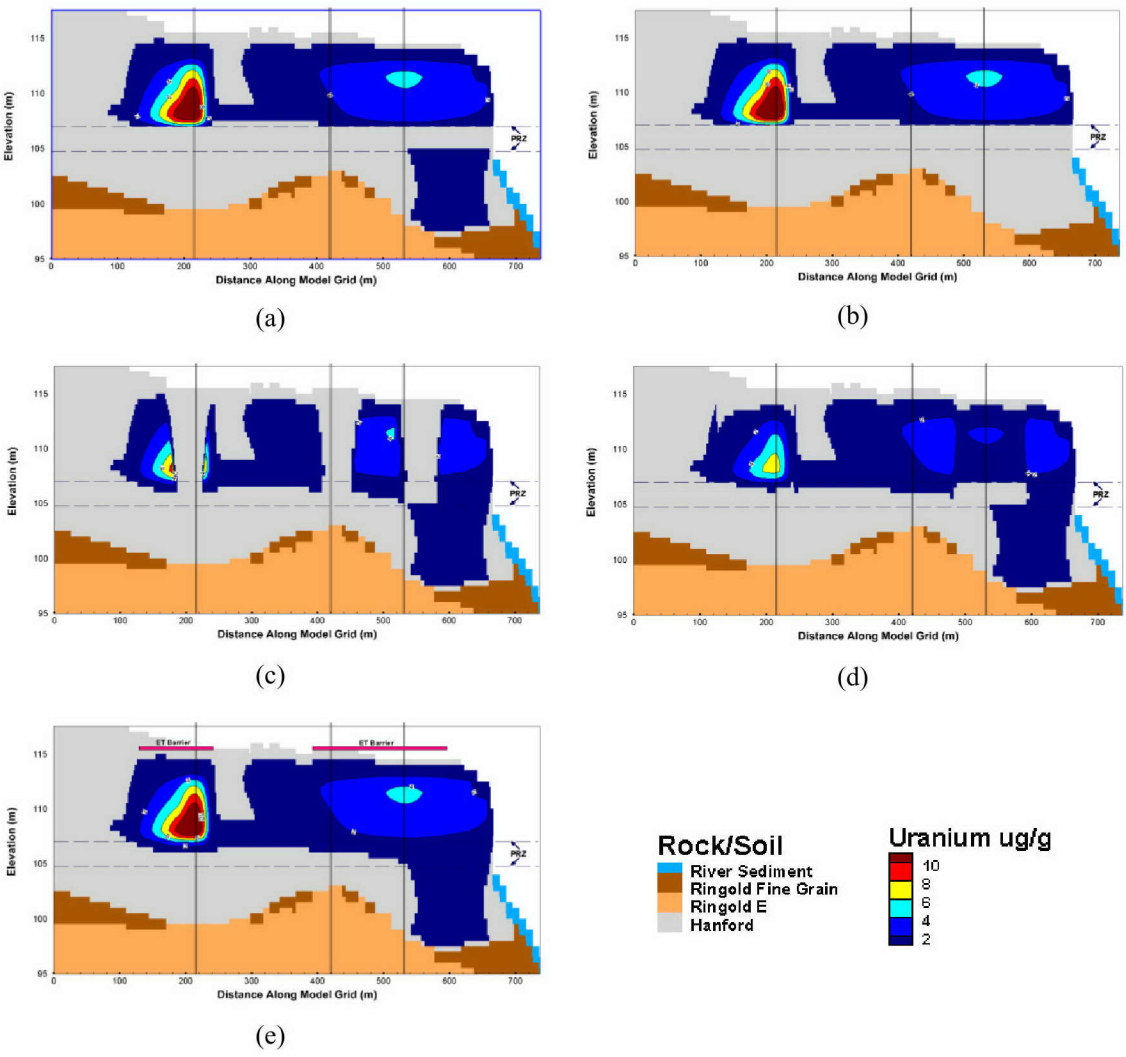
Statistic	Case	Recharge Scenario	Simulation Time for Concentration to Reach MCL			Number of Years(1) for Concentration to Reach MCL			Calendar Year for Concentration to Reach MCL		
			399-1-17A	399-1-7	399-2-2	399-1-17A	399-1-7	399-2-2	399-1-17A	399-1-7	399-2-2
90th Percentile	No Action	Native Veg	58	50	52	38	30	32	2049	2041	2043
		Industrial	48	45	45	28	25	25	2039	2036	2036
	RA 6	Native Veg	31	36	38	11	16	18	2022	2027	2029
		Industrial	32	35	36	12	15	16	2023	2026	2027
	RA 7	Native Veg	24	30	32	4	10	12	2015	2021	2023
		Industrial	25	32	32	5	12	12	2016	2023	2023
	RA 8	Native Veg	22	30	32	2	10	12	2013	2021	2023
		Industrial	22	32	32	2	12	12	2013	2023	2023
	RA 9	Native Veg	22	28	30	2	8	10	2013	2019	2021
		Industrial	21	28	30	1	8	10	2012	2019	2021
	RA 10	Native Veg	40	40	42	20	20	22	2031	2031	2033
		Industrial	36	38	40	16	18	20	2027	2029	2031

Table 6-2. Time for the Maximum, 95th UCL, 90th Percentile, and Mean of the Simulated Groundwater Uranium Concentration to Drop Below Maximum Contaminant Level for No-Action Scenario and Remedial Alternatives 6 through 10 for the Native Vegetation and Industrial Recharge Scenarios

Statistic	Case	Recharge Scenario	Simulation Time for Concentration to Reach MCL			Number of Years(1) for Concentration to Reach MCL			Calendar Year for Concentration to Reach MCL		
			399-1-17A	399-1-7	399-2-2	399-1-17A	399-1-7	399-2-2	399-1-17A	399-1-7	399-2-2
Mean	No Action	Native Veg	38	42	50	18	22	30	2029	2033	2041
		Industrial	34	39	45	14	20	25	2025	2031	2036
	RA 6	Native Veg	24	32	36	4	12	16	2015	2023	2027
		Industrial	25	32	35	5	12	15	2016	2023	2026
	RA 7	Native Veg	22	28	32	2	8	12	2013	2019	2023
		Industrial	22	28	31	2	8	11	2013	2019	2022
	RA 8	Native Veg	21	28	32	1	8	12	2012	2019	2023
		Industrial	21	28	31	1	8	11	2012	2019	2022
	RA 9	Native Veg	21	26	30	1	6	10	2012	2017	2021
		Industrial	21	26	28	1	6	8	2012	2017	2019
	RA 10	Native Veg	30	36	40	10	16	20	2021	2027	2031
		Industrial	28	35	38	8	15	18	2019	2026	2029

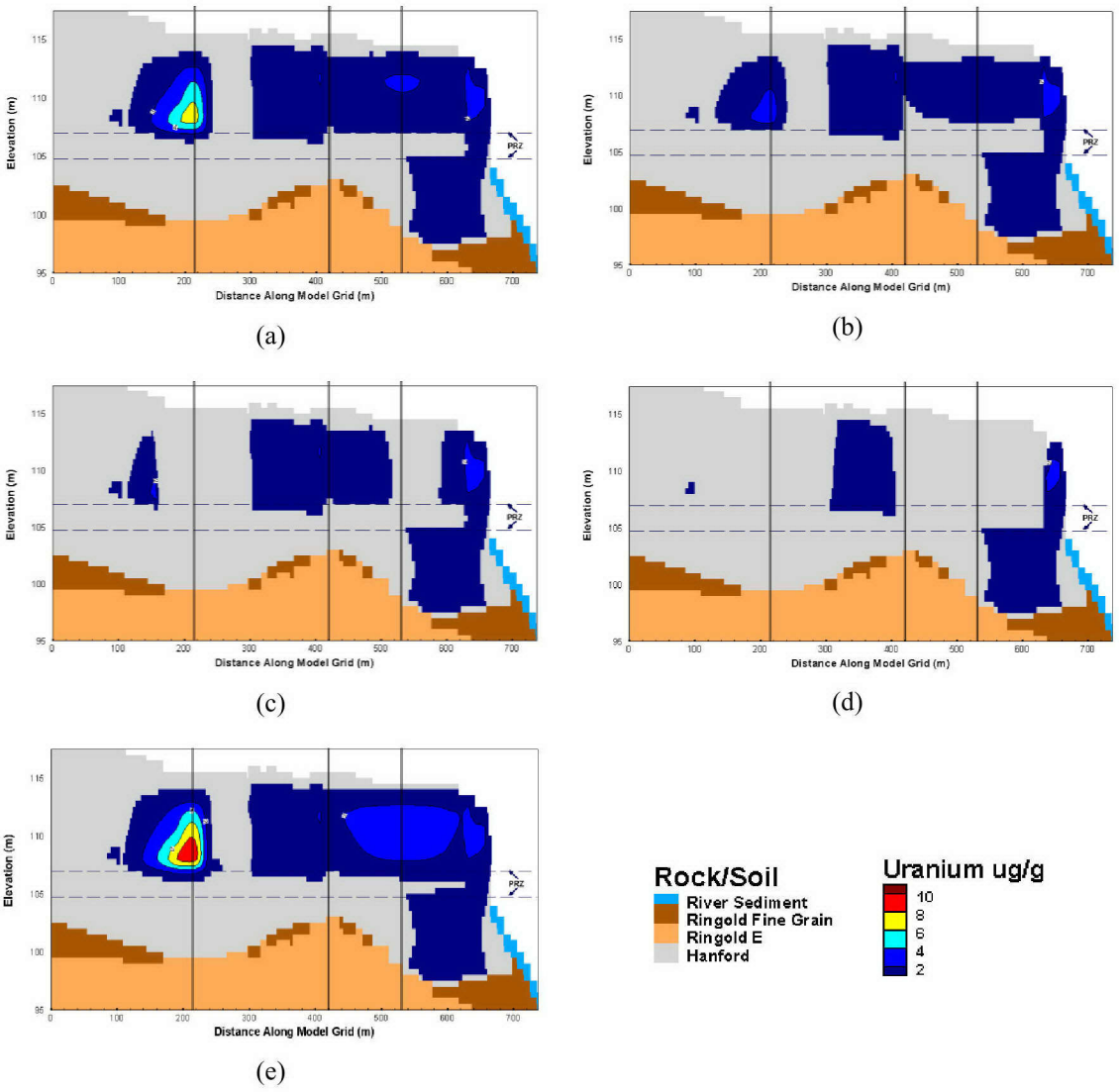
Note: (1) Years after start of remediation on January 1, 2012

RA = remedial alternative; Native Veg = native vegetation recharge scenario (transitioning from bare ground to native shrub steppe vegetation cover); Industrial = industrial recharge scenario (transitioning from bare disturbed ground to cheatgrass cover on disturbed ground)



Note: The well locations (vertical lines) are shown for geographic reference only and do not indicate the actual depths and screened intervals

Figure 6-17. Uranium Soil Concentrations at the Start of 2012 for: a) RA 1, b) RA 2, c) RA3, d) RA 4, and e) RA 5, Based on the Kinetic Sorption, Groundwater Alkalinity Model



Note: The well locations (vertical lines) are shown for geographic reference only and do not indicate the actual depths and screened intervals

Figure 6-18. Uranium Soil Concentrations at the Start of 2012 for: a) RA 6, b) RA 7, c) RA 8, d) RA 9, and e) RA 10 based on the Kinetic Sorption, Groundwater Alkalinity Model

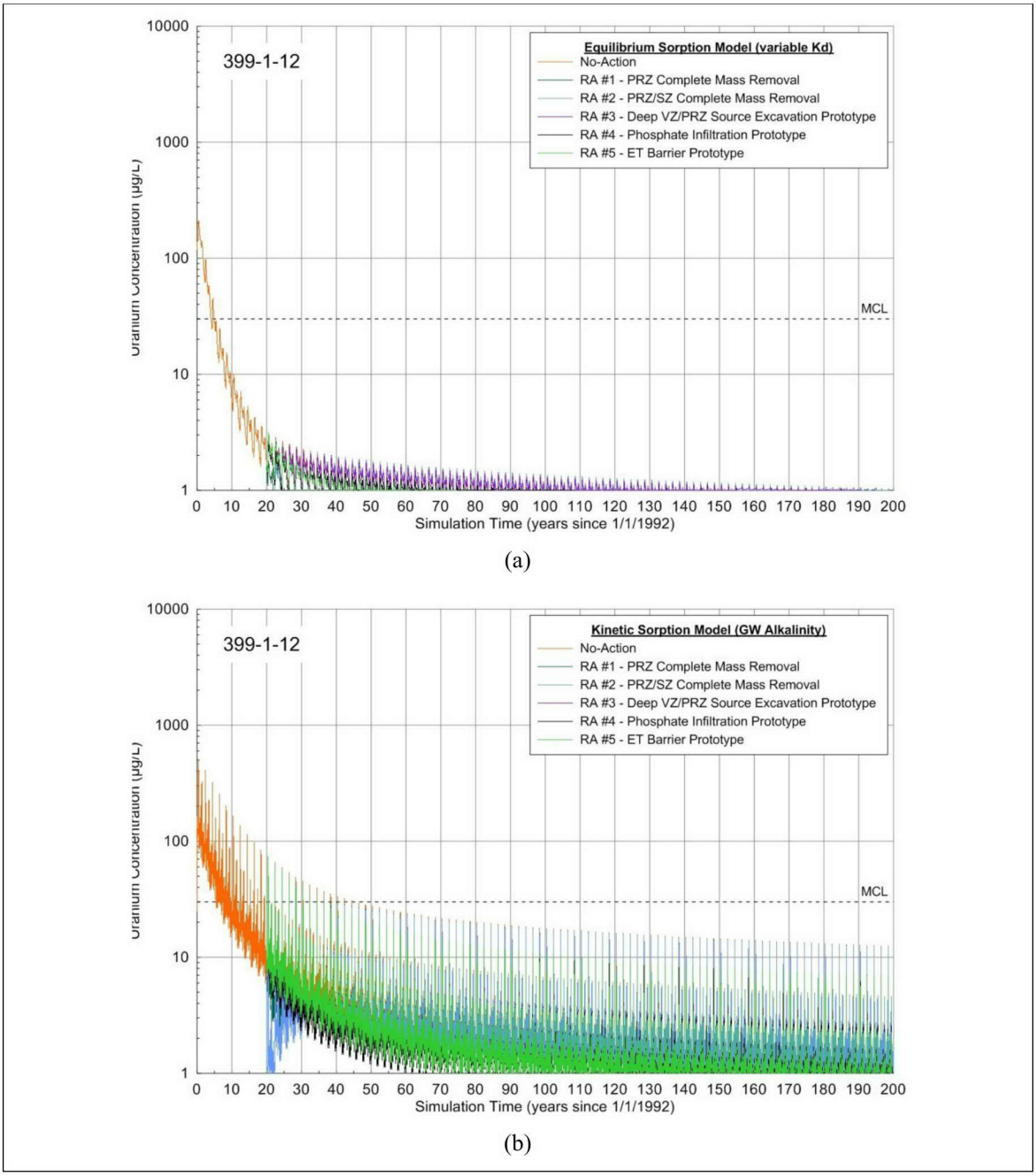


Figure 6-19. No-Action and Remedial Alternatives 1 through 5 (Native Vegetation Recharge Scenario) Simulated Groundwater Uranium Concentrations at Well 399-1-12 for the (a) Equilibrium Sorption Model (Variable K_d) and (b) Kinetic Sorption Model (GW Alkalinity)

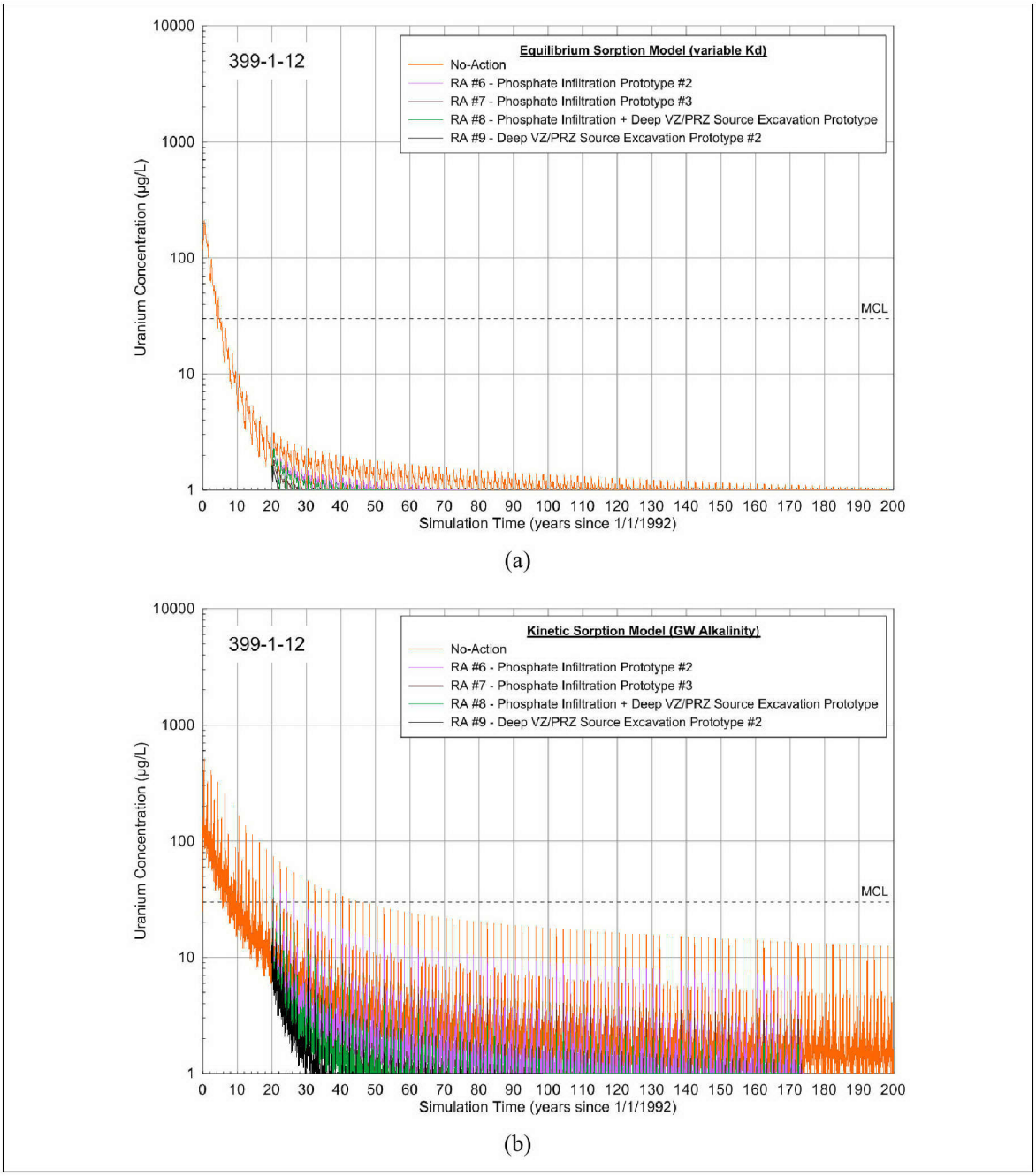


Figure 6-20. No-Action and Remedial Alternatives 6 through 9 (Native Vegetation Recharge Scenario) Simulated Groundwater Uranium Concentrations at Well 399-1-12 for: (a) Equilibrium Sorption Model (Variable K_d) and (b) Kinetic Sorption Model (GW Alkalinity)

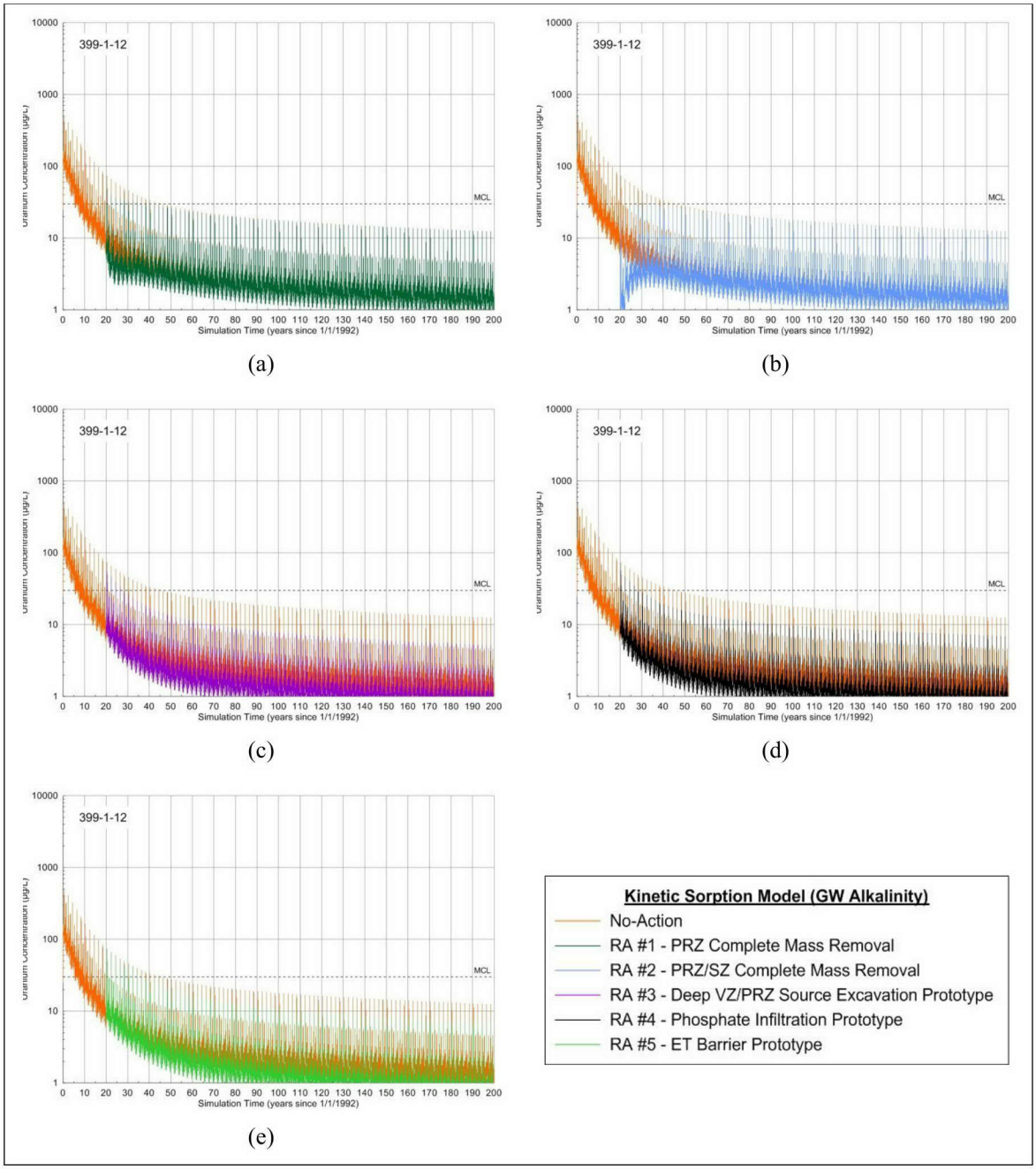


Figure 6-21. No-Action and Remedial Alternatives (Native Vegetation Recharge Scenario) Simulated Groundwater Uranium Concentrations for the Kinetic Sorption Model (GW Alkalinity) at Well 399-1-12 for: (a) RA 1, (b) RA 2, (c) RA 3, (d) RA 4, and (e) RA 5

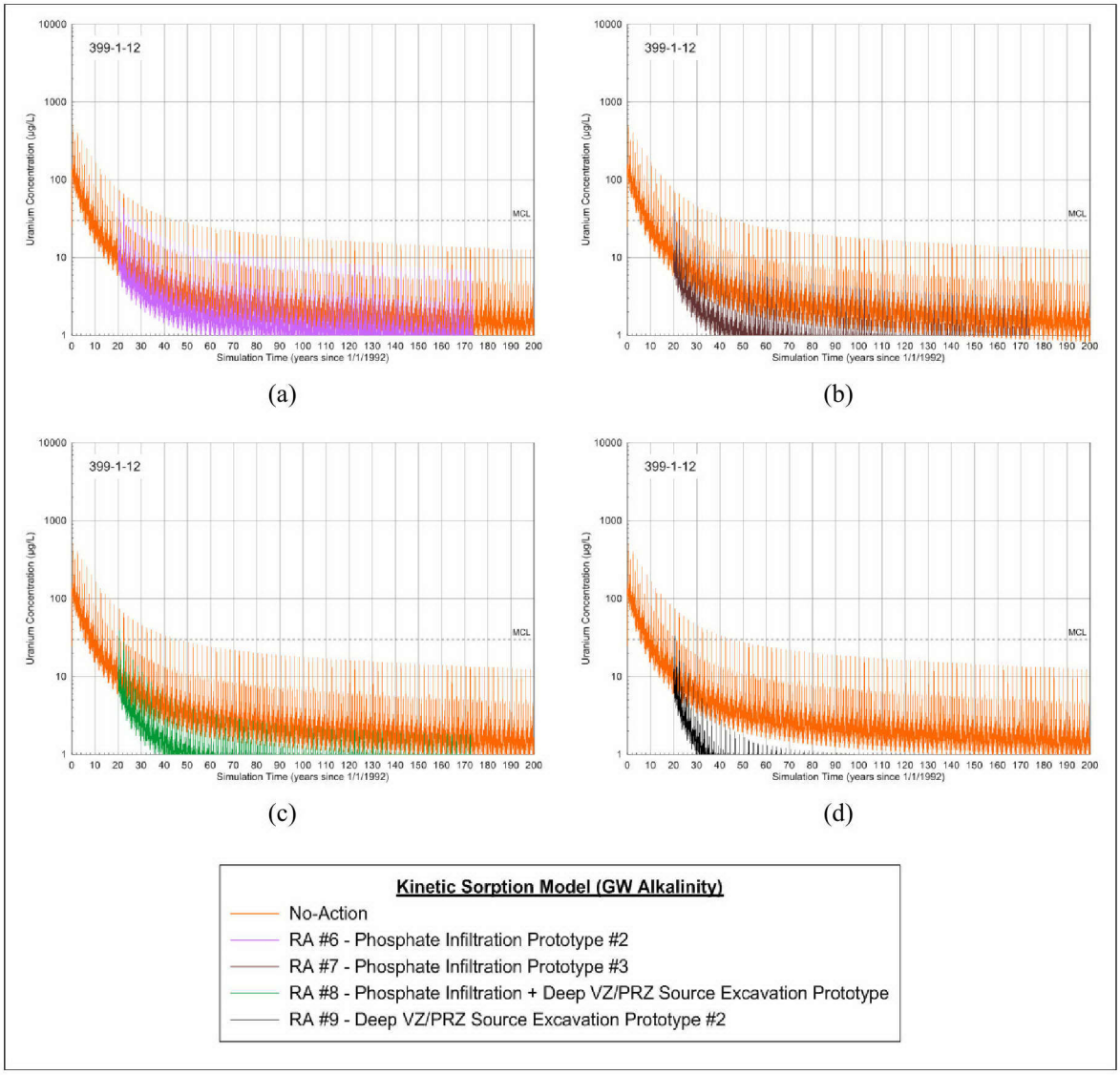


Figure 6-22. No-Action and Remedial Alternatives (Native Vegetation Recharge Scenario) Simulated Groundwater Uranium Concentrations for the Kinetic Sorption Model (GW Alkalinity) at Well 399-1-12 for: (a) RA 6, (b) RA 7, (c) RA 8, and (d) RA 9

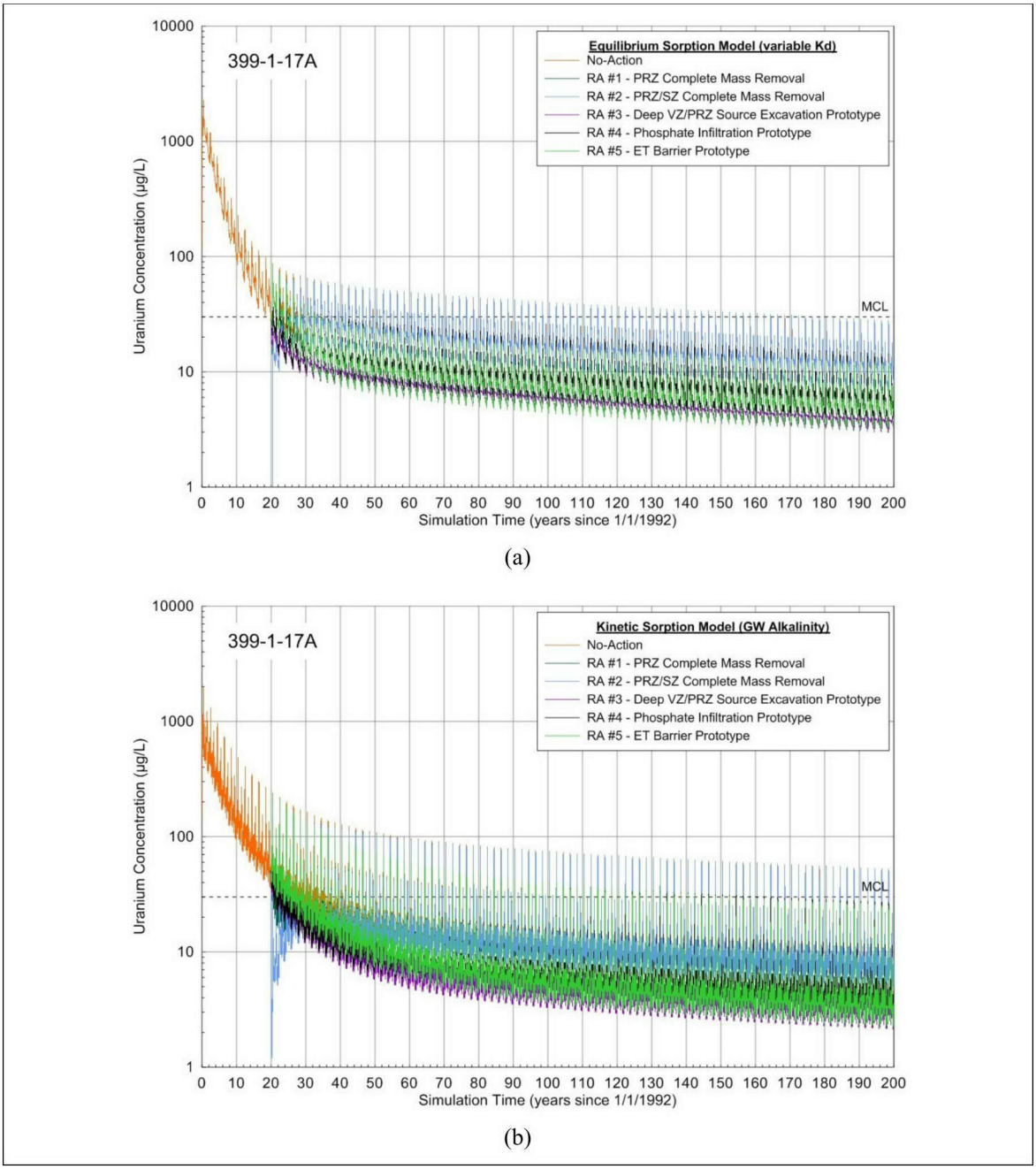


Figure 6-23. No-Action and Remedial Alternatives 1 through 5 (Native Vegetation Recharge Scenario) Simulated Groundwater Uranium Concentrations at Well 399-1-17A for: (a) Equilibrium Sorption Model (Variable K_d) and (b) Kinetic Sorption Model (GW Alkalinity)

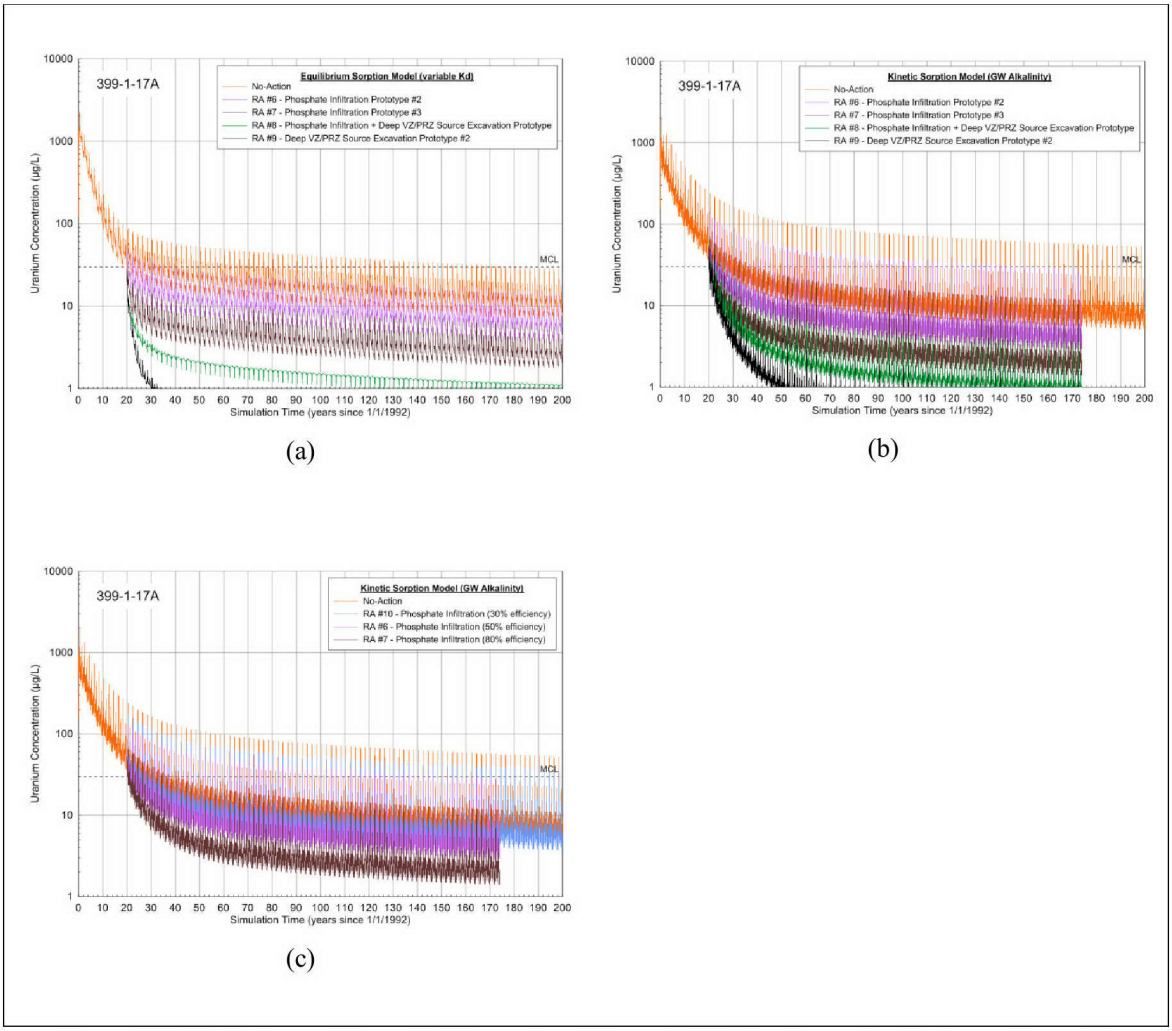


Figure 6-24. No-Action and Remedial Alternatives 6 through 9 (Native Vegetation Recharge Scenario) Simulated Groundwater Uranium Concentrations at Well 399-1-17A for: (a) Equilibrium Sorption Model (Variable K_d) and (b) and (c) Kinetic Sorption Model (GW Alkalinity)

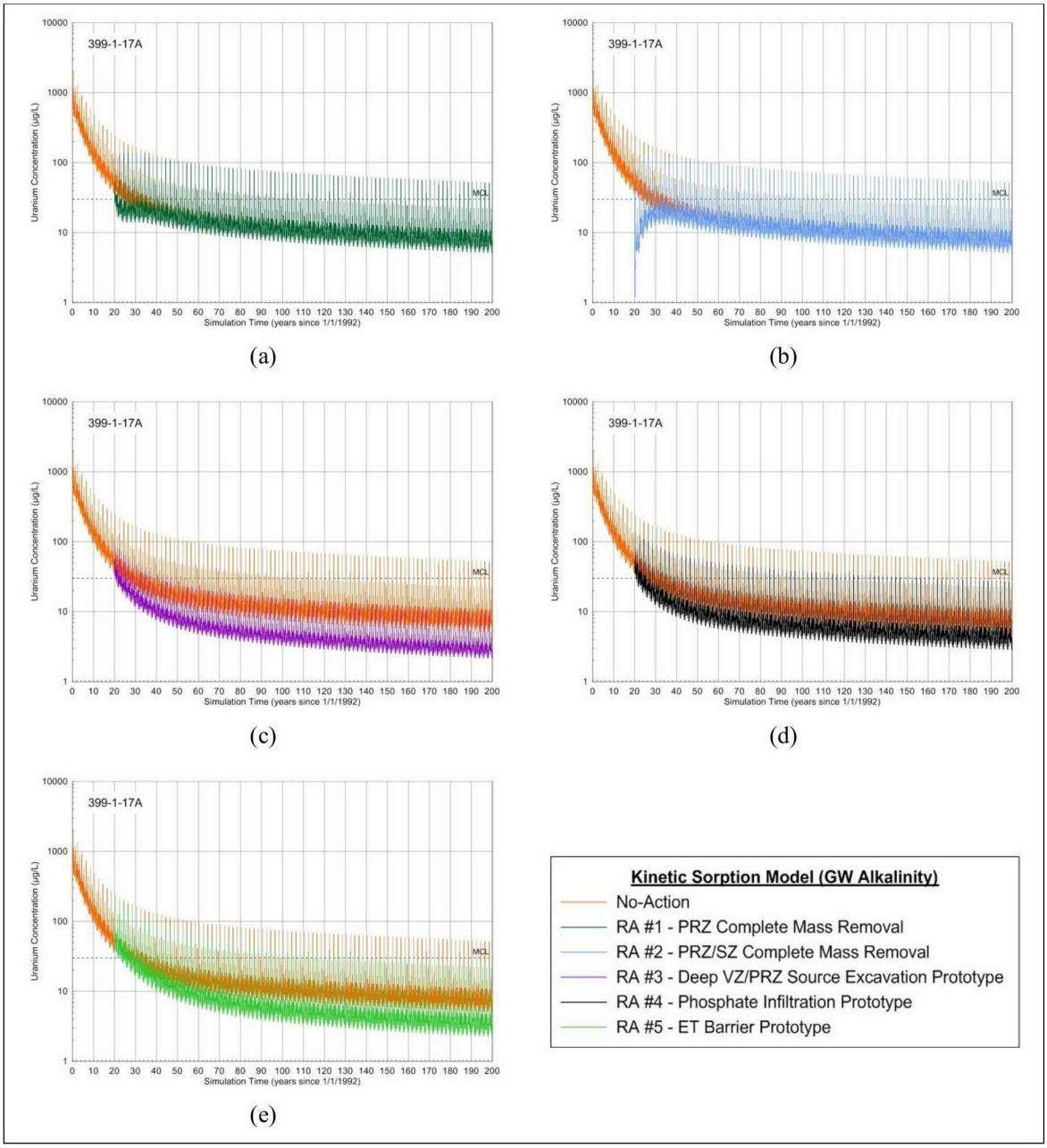


Figure 6-25. No-Action and Remedial Alternatives (Native Vegetation Recharge Scenario) Simulated Groundwater Uranium Concentrations for the Kinetic Sorption Model (GW Alkalinity) at Well 399-1-17A for: (a) RA 1, (b) RA 2, (c) RA 3, (d) RA 4, and (e) RA 5

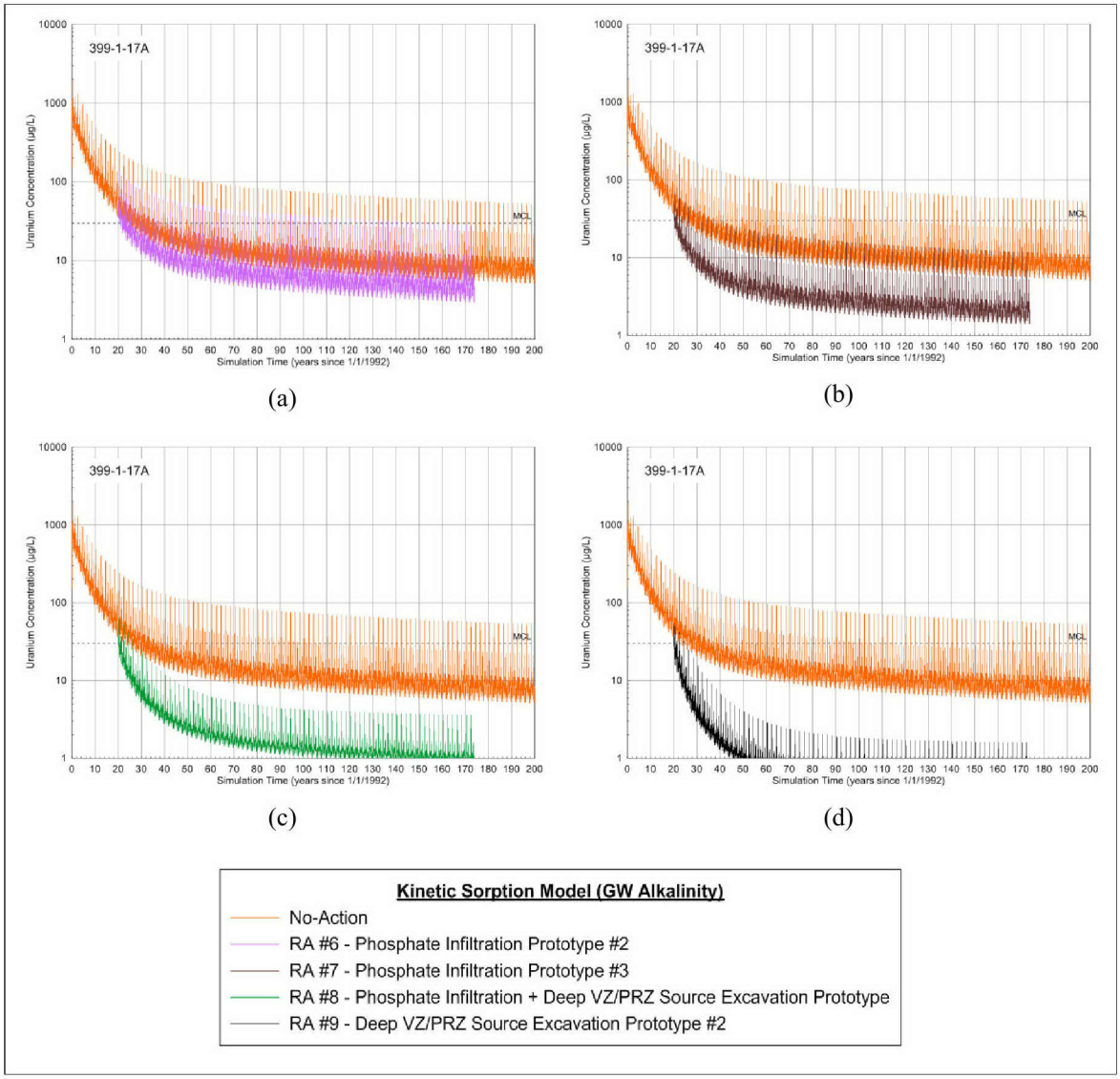


Figure 6-26. No-Action and Remedial Alternatives Simulated (Native Vegetation Recharge Scenario) Groundwater Uranium Concentrations for the Kinetic Sorption Model (GW alkalinity) at Well 399-1-17A for: (a) RA 6, (b) RA 7, (c) RA 8 (d) RA 9

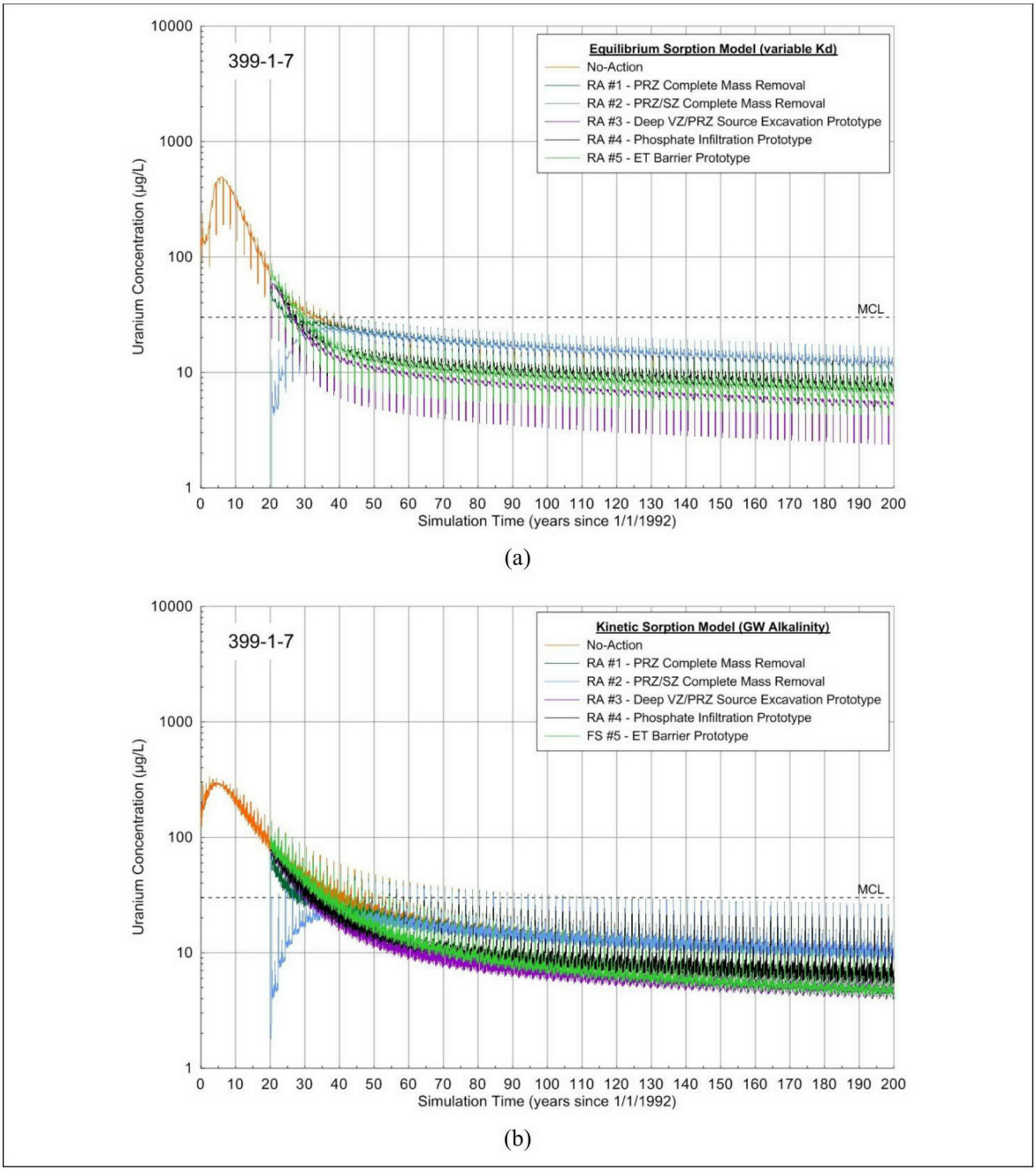


Figure 6-27. No-Action and Remedial Alternatives 1 through 5 (Native Vegetation Recharge Scenario) Simulated Groundwater Uranium Concentrations at Well 399-1-7 for: (a) Equilibrium Sorption Model (Spatially Variable K_d) and (b) Kinetic Sorption Model (GW Alkalinity)

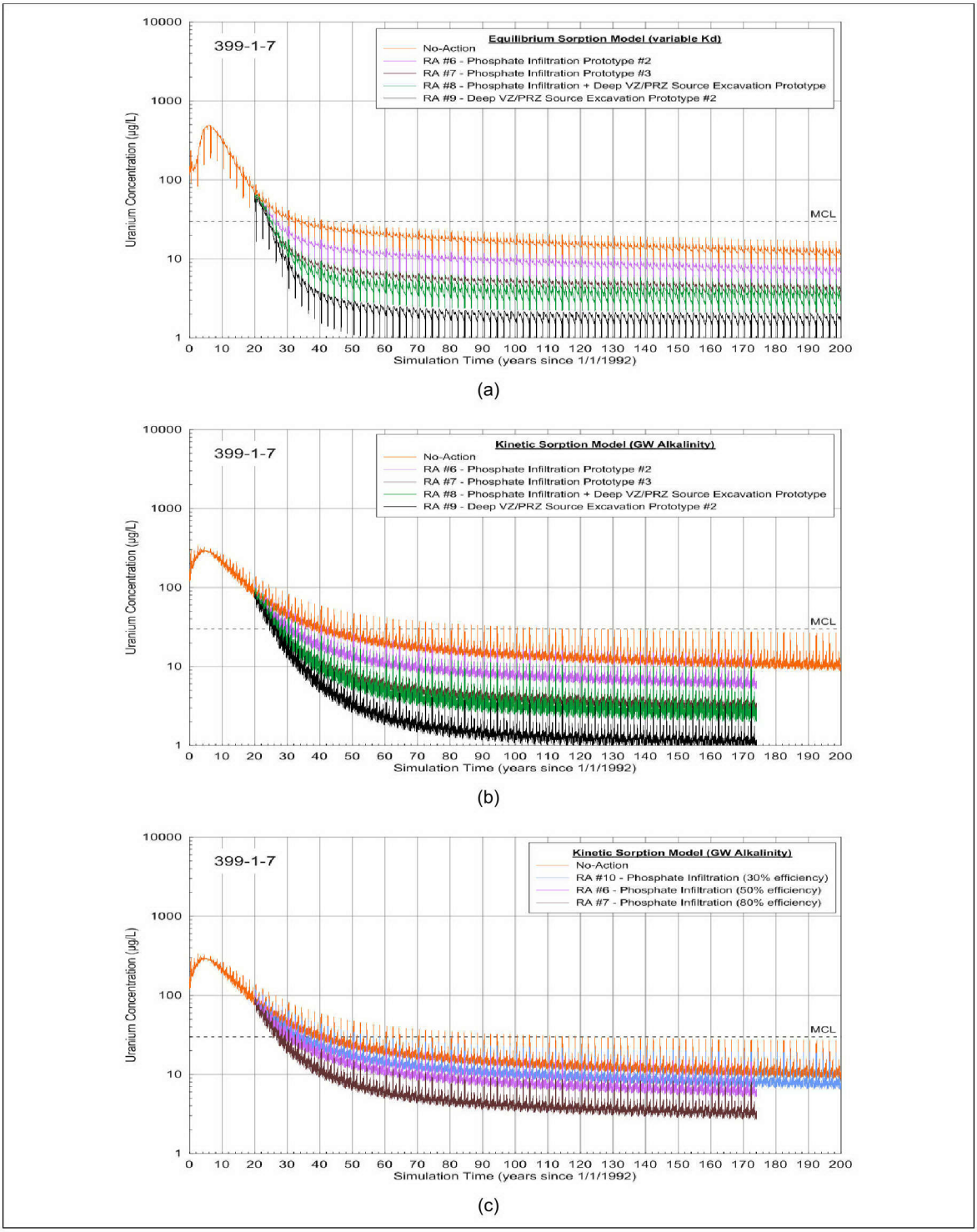


Figure 6-28. No-Action and Remedial Alternatives 6 through 10 (Native Vegetation Recharge Scenario) Simulated Groundwater Uranium Concentrations at Well 399-1-7 for: (a) Equilibrium Sorption Model (Spatially Variable K_d), (b) and (c) Kinetic Sorption Model (GW Alkalinity)

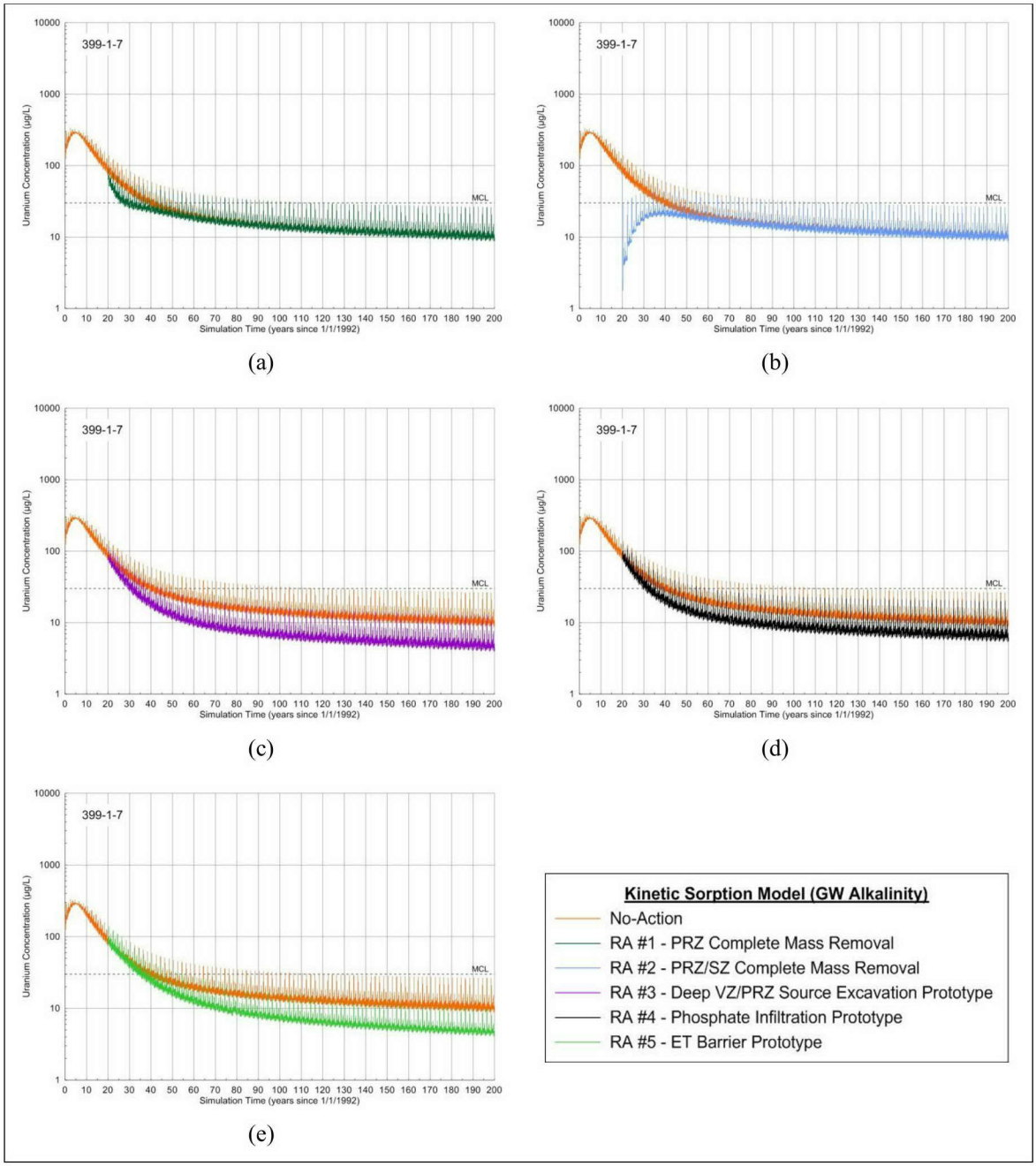


Figure 6-29. No-Action and Remedial Alternatives (Native Vegetation Recharge Scenario) Simulated Groundwater Uranium Concentrations for the Kinetic Sorption Model (GW Alkalinity) at Well 399-1-7 for: (a) RA 1, (b) RA 2, (c) RA 3, (d) RA 4, and (e) RA 5

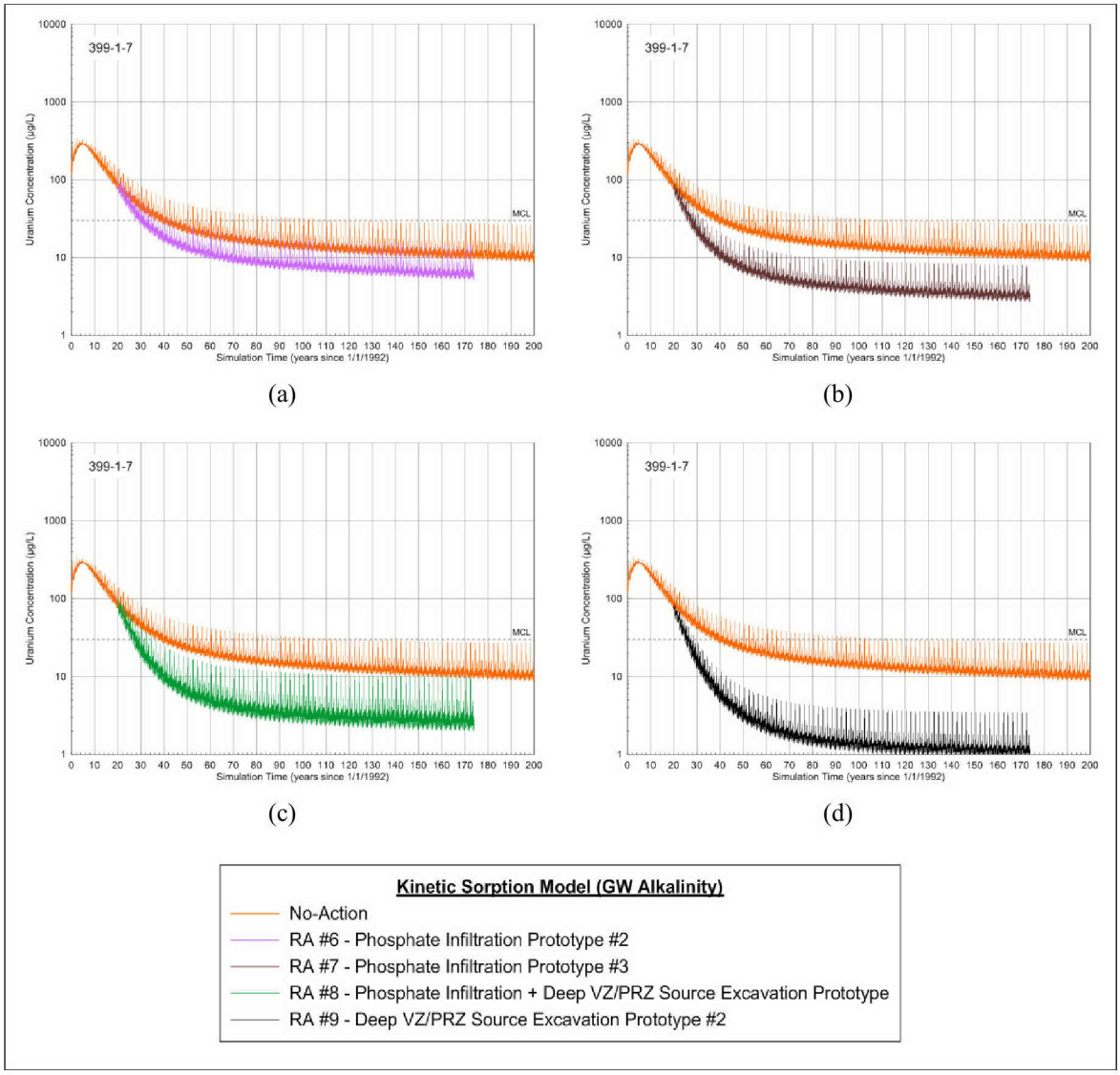
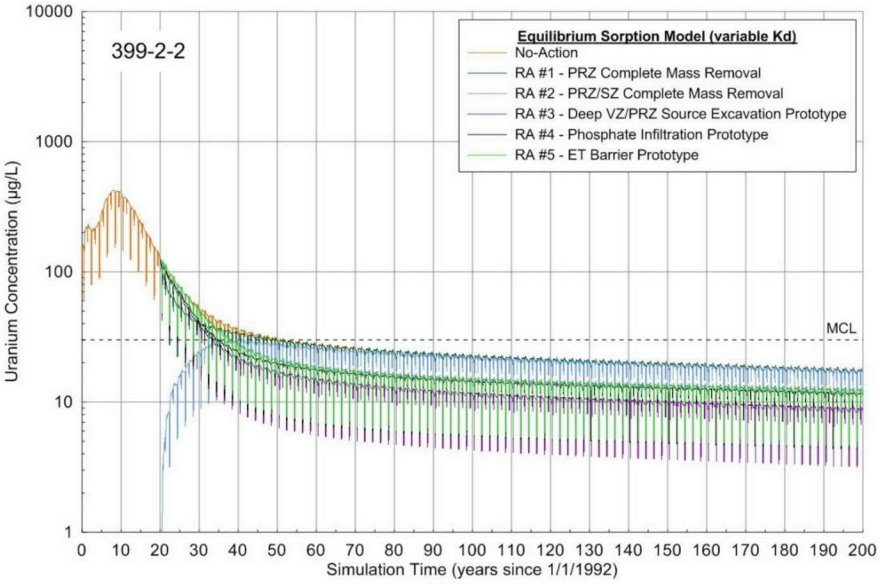
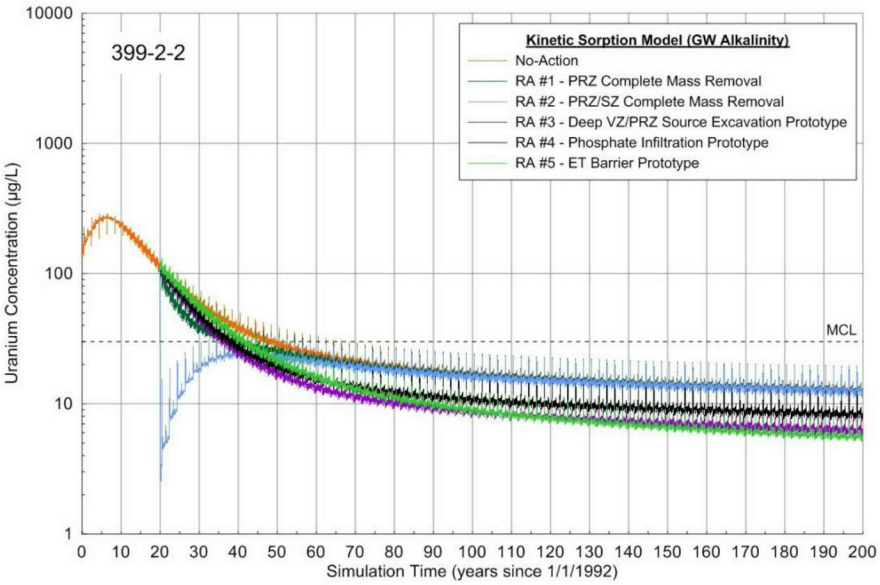


Figure 6-30. No-Action and Remedial Alternatives (Native Vegetation Recharge Scenario) Simulated Groundwater Uranium Concentrations for the Kinetic Sorption Model (GW Alkalinity) at Well 399-1-7 for: (a) RA 6, (b) RA 7, (c) RA 8, and (d) RA 9



(a)



(b)

Figure 6-31. No-Action and Remedial Alternatives 1 through 5 (Native Vegetation Recharge Scenario) Simulated Groundwater Uranium Concentrations at Well 399-2-2 for: (a) Equilibrium Sorption Model (Variable K_d) and (b) Kinetic Sorption Model (GW Alkalinity)

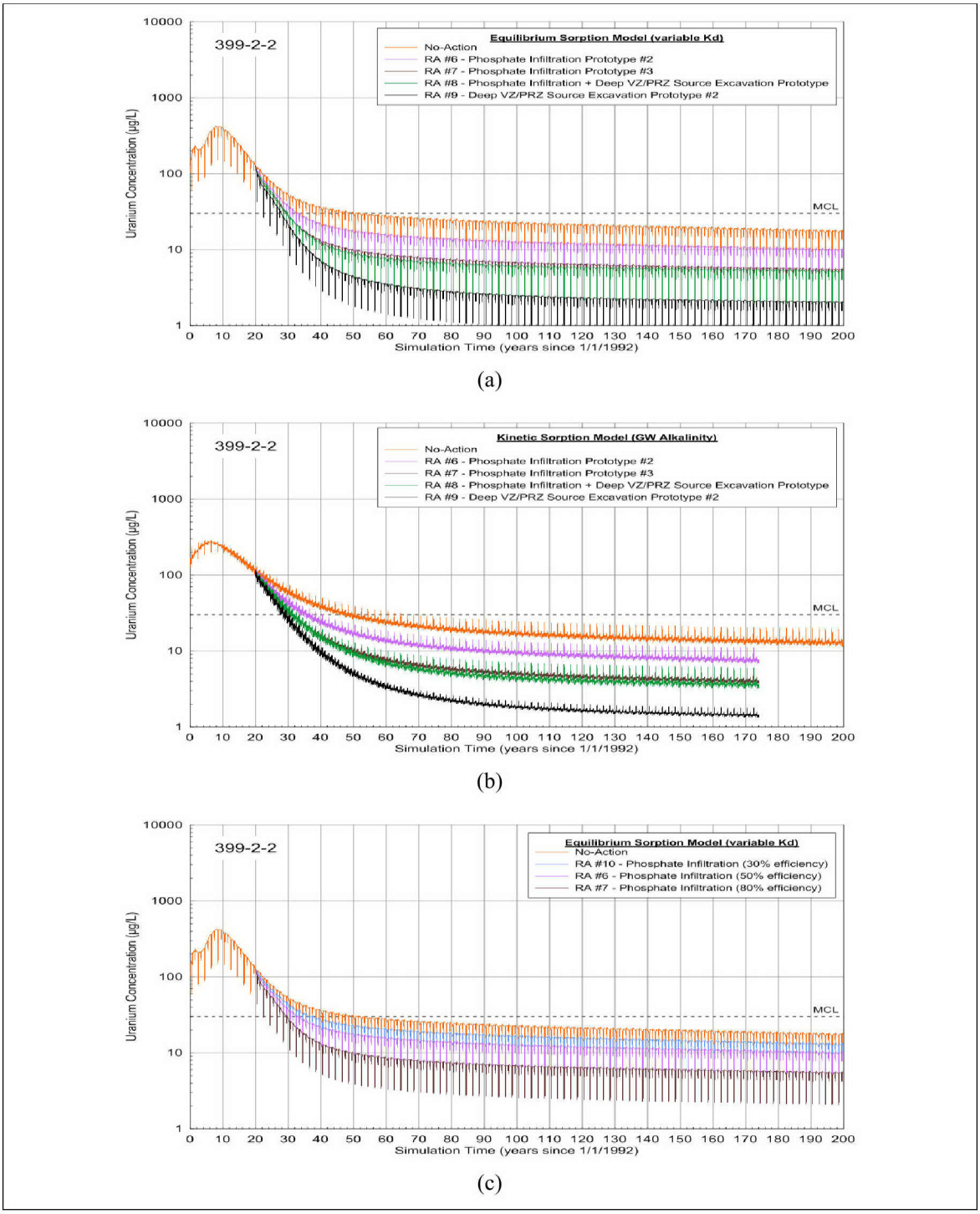


Figure 6-32. No-Action and Remedial Alternatives 6 through 10 (Native Vegetation Recharge Scenario) Simulated Groundwater Uranium Concentrations at Well 399-2-2 for the (a) Equilibrium Sorption Model (Spatially Variable K_d), (b) and (c) Kinetic Sorption Model (GW Alkalinity)

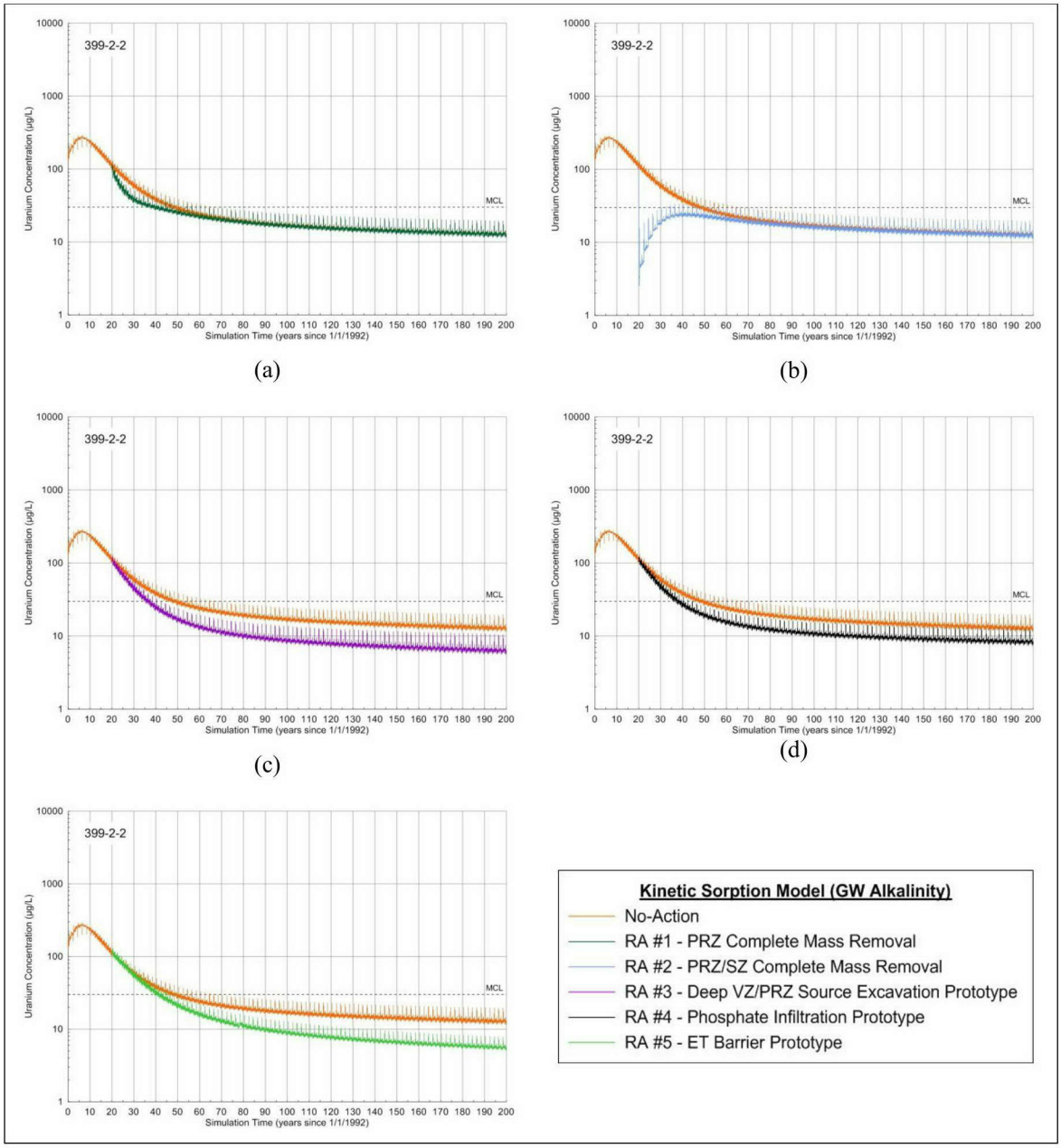


Figure 6-33. No-Action and Remedial Alternatives (Native Vegetation Recharge Scenario) Simulated Groundwater Uranium Concentrations for the Kinetic Sorption Model (GW Alkalinity) at Well 399-2-2 for: (a) RA 1, (b) RA 2, (c) RA 3, (d) RA 4, and (e) RA 5

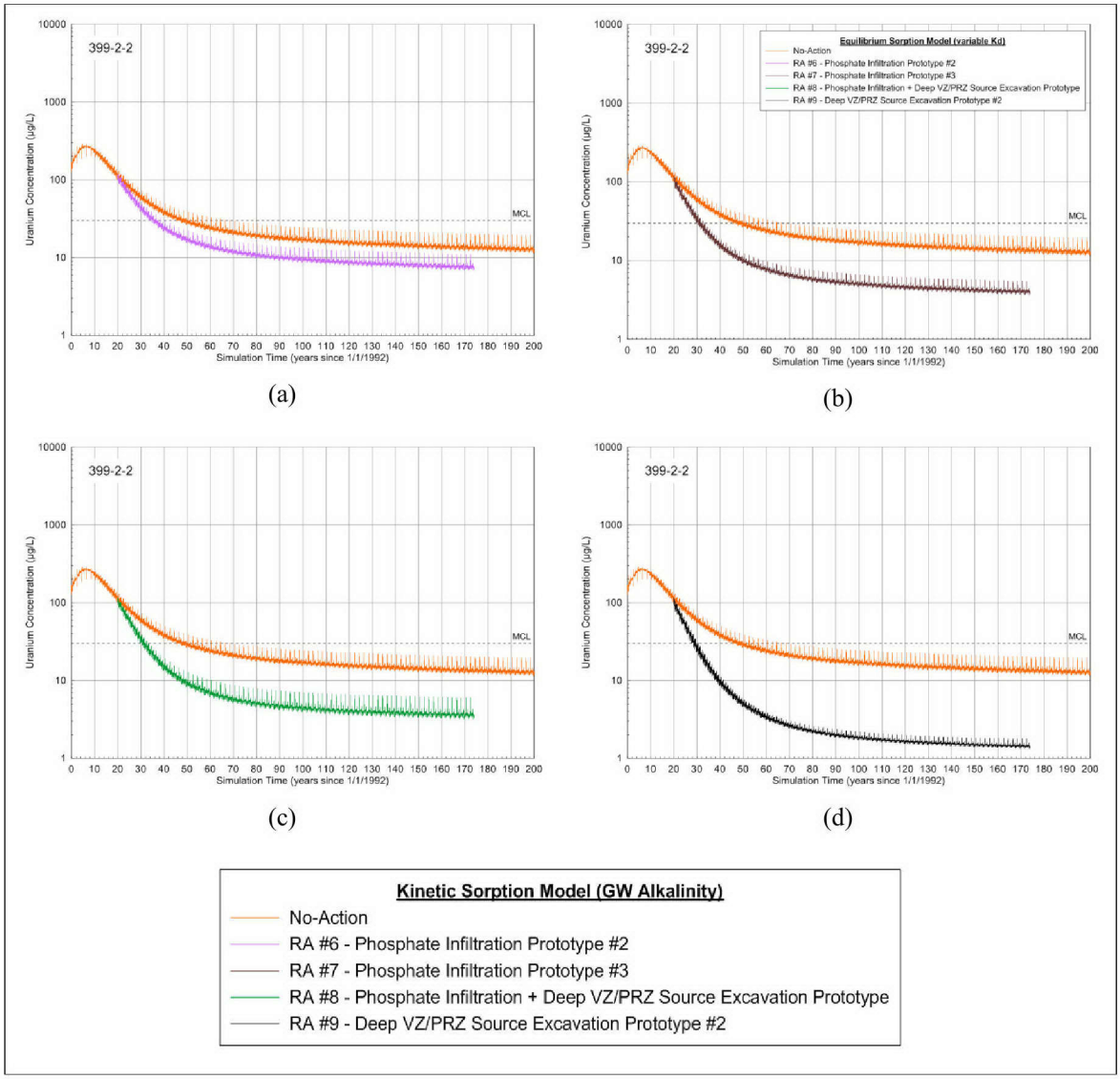


Figure 6-34. No-Action and Remedial Alternatives (Native Vegetation Recharge Scenario) Simulated Groundwater Uranium Concentrations for the Kinetic Sorption Model (GW Alkalinity) at Well 399-2-2 for: (a) RA 6, (b) RA 7, (c) RA 8, and (d) RA 9

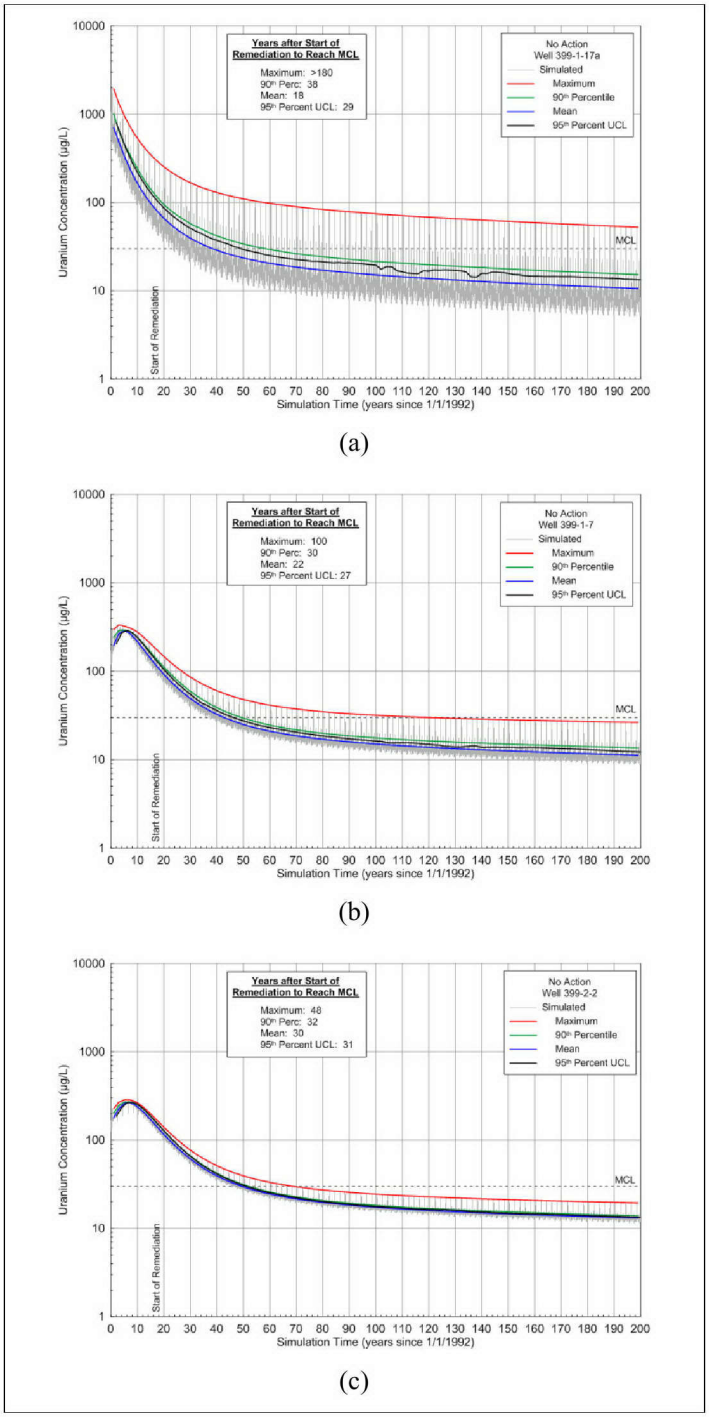


Figure 6-35. Maximum, 90th percentile, 95th UCL and Mean (Native Vegetation Recharge Scenario) Simulated Uranium Groundwater Concentrations for the Kinetic Sorption Model (GW Alkalinity) No-Action Scenario at Wells: (a) 399-1-17A, (b) 399-1-7, and (c) 399-2-2

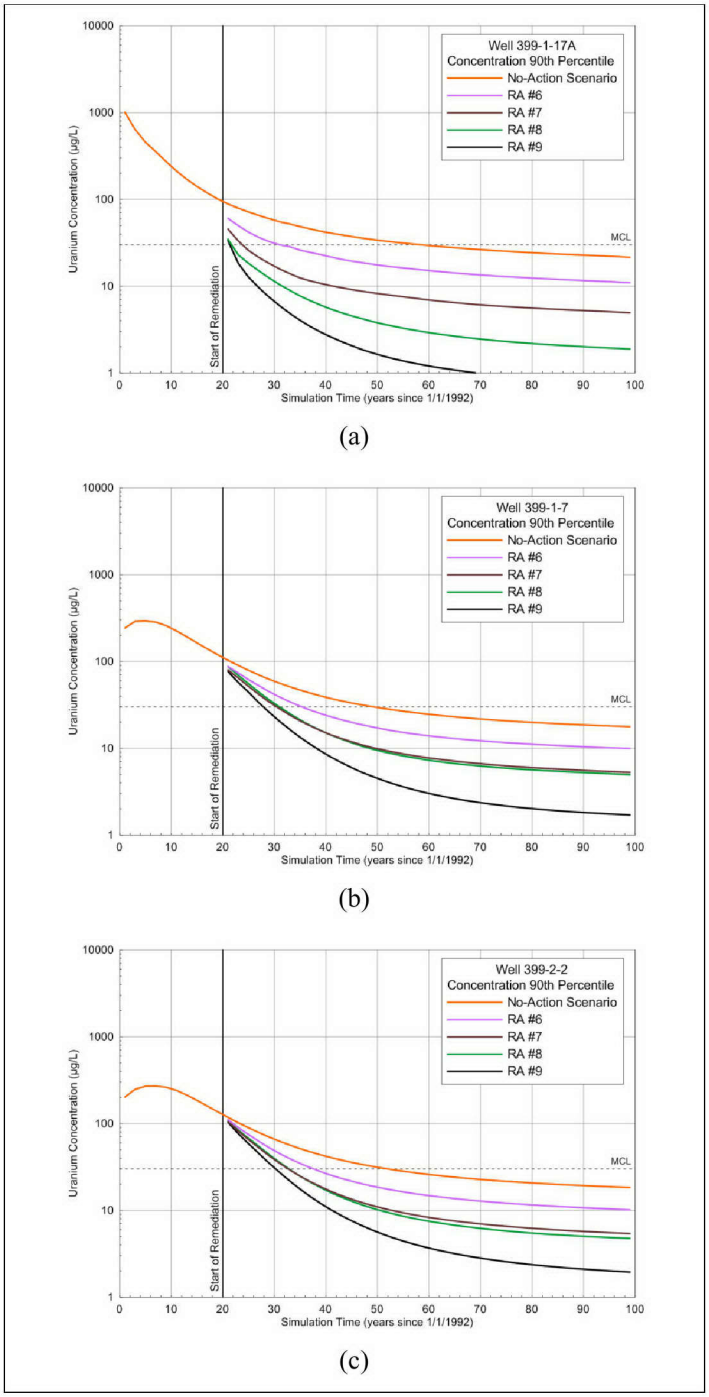


Figure 6-36. Comparison of 90th Percentile (Native Vegetation Recharge Scenario) Simulated Uranium Groundwater Concentrations for the Kinetic Sorption Model (GW Alkalinity) No-Action Scenario and RA 6 through RA 9 at Wells: (a) 399-1-17A, (b) 399-1-7, and (c) 399-2-2

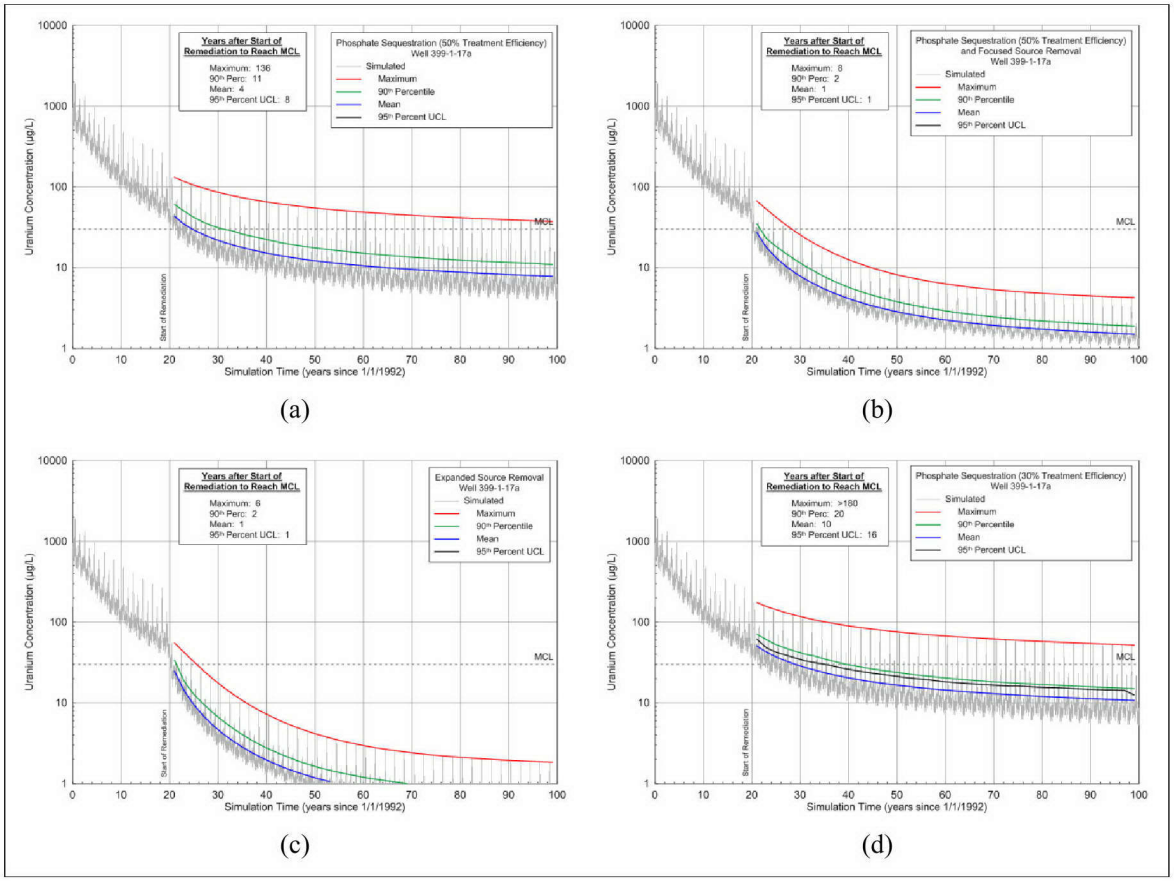


Figure 6-37. Maximum, 90th Percentile, 95th UCL and Mean (Native Vegetation Recharge Scenario) Simulated Uranium Groundwater Concentrations at Well 399-1-17A for the Kinetic Sorption Model (GW Alkalinity) for: (a) RA 6, (b) RA 8 (c) RA 9, and (d) RA 10

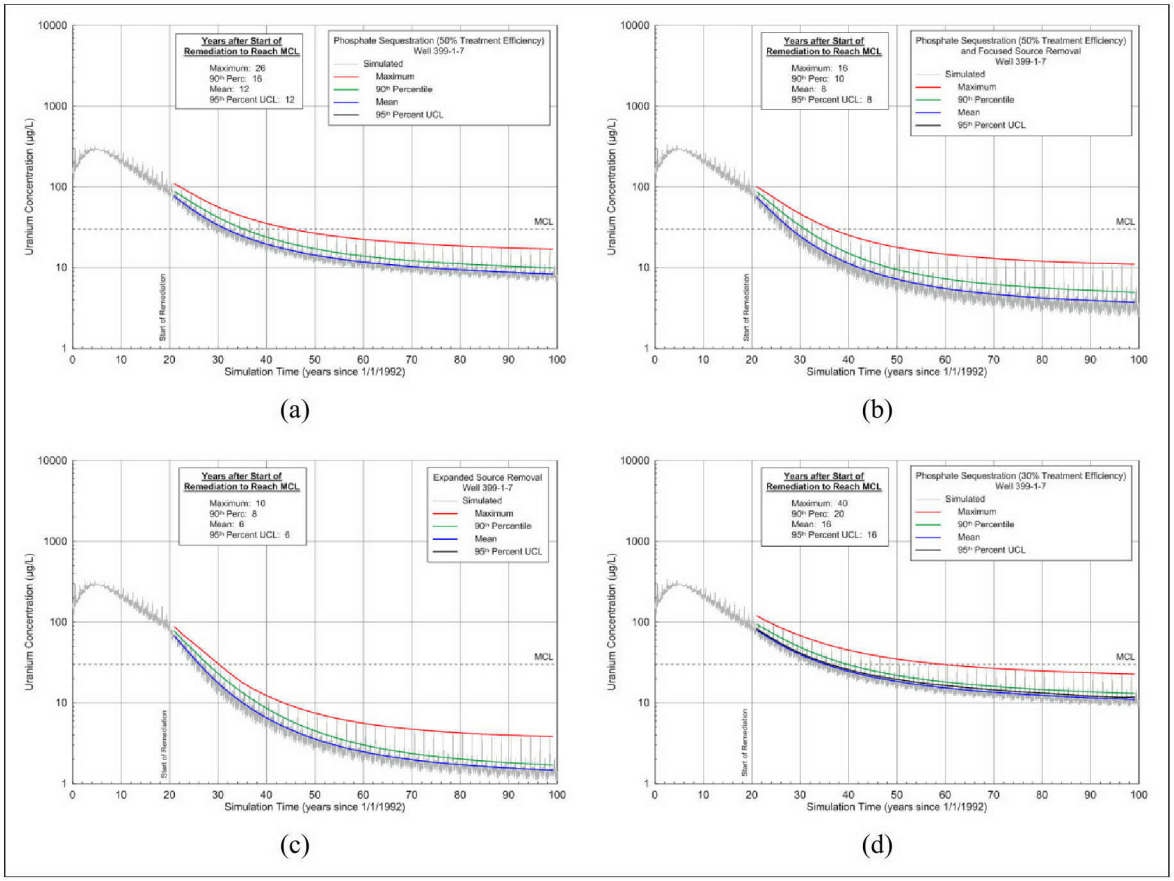


Figure 6-38. Maximum, 90th Percentile, 95th UCL and Mean (Native Vegetation Recharge Scenario) Simulated Uranium Groundwater Concentrations at Well 399-1-7 for the Kinetic Sorption Model (GW Alkalinity) for: (a) RA 6, (b) RA 8 (c) RA 9, and (d) RA 10

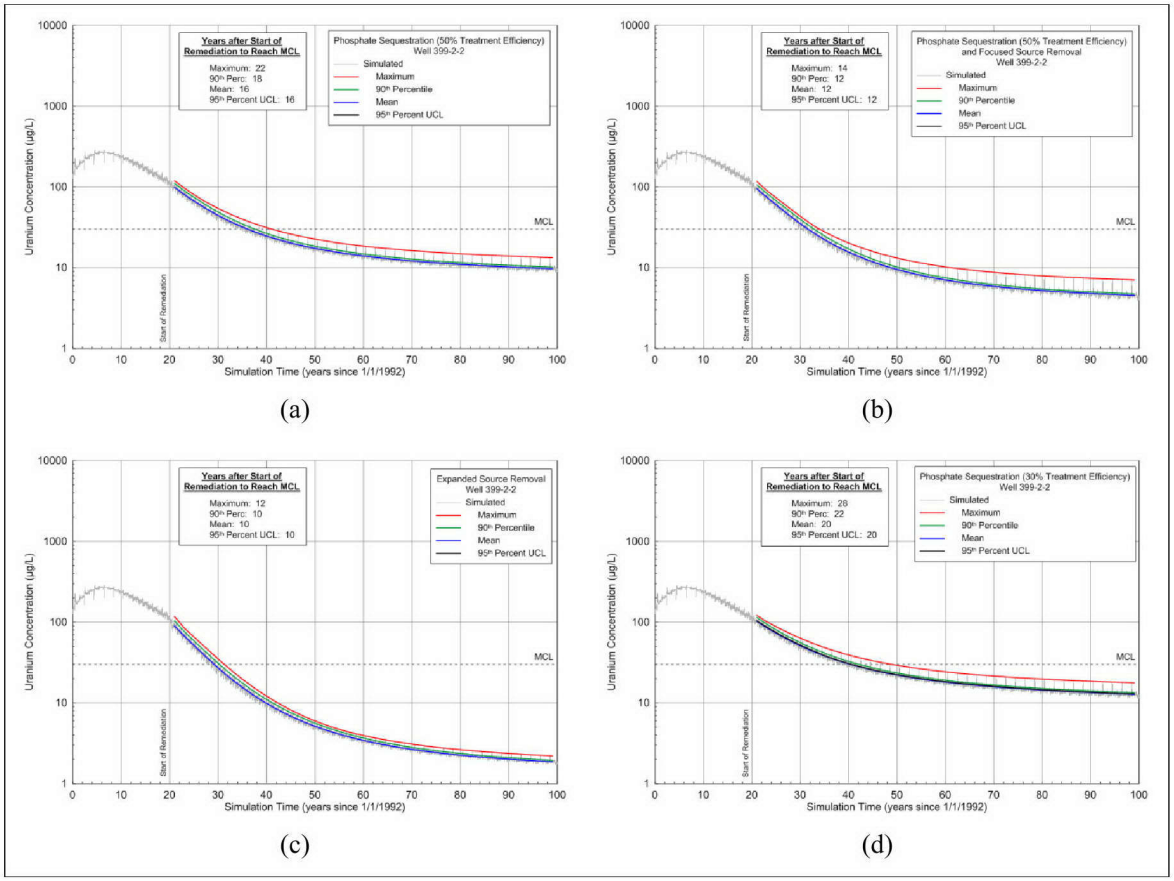


Figure 6-39. Maximum, 90th Percentile, 95th UCL and Mean (Native Vegetation Recharge Scenario) Simulated Uranium Groundwater Concentrations at Well 399-2-2 for the Kinetic Sorption Model (GW Alkalinity) for: (a) RA 6, (b) RA 8 (c) RA 9, and (d) RA 10

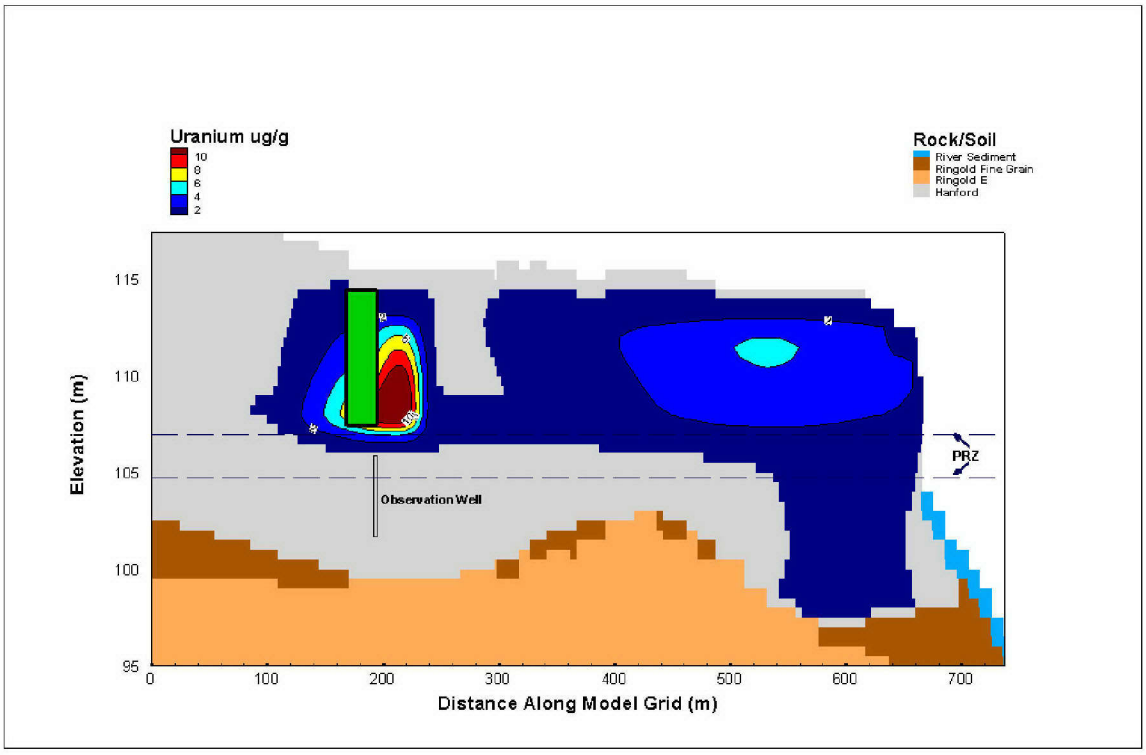
6.5 Uranium Soil Screening Level (SSL) and Preliminary Remediation Goal (PRG) Determination

Part of the risk analysis conducted for the 300 Area RI/FS is the determination of SSLs and PRGs. SSLs and PRGs are used to define the maximum soil concentration of a contaminant that can remain within the vadose zone after a remedial action has been undertaken. SSL and PRG values are determined that are to be protective of groundwater and surface water, that is, the maximum concentration is calculated such that the contaminant will not result in the degradation of the groundwater or surface water to levels above the applicable regulatory water quality standard. SSL values are computed to be protective under the bounding irrigation recharge scenario, while PRGs are computed to be protective under the most reasonably anticipated recharge scenario (industrial use or conservation with native vegetation, as appropriate to designated land use).

The 2-D cross-section model (June-North cross section) was utilized for developing groundwater and surface water SSL and PRG values for uranium because it represents all of the relevant features and processes that are important for the mobility of uranium in the 300 Area. However, because of extensive contamination throughout the domain of that model (in both vadose zone and the saturated zone) it is difficult to isolate the impact on groundwater from primarily vertical transport of uranium through the vadose zone underneath a waste site from that caused by lateral movement of dissolved uranium mass from surrounding locations in the saturated zone and PRZ. To understand better the impact of soil contamination of uranium from a waste site on groundwater concentrations a stylized analysis was conducted, where the mass distribution of uranium from a waste site was conceptualized and guided by the simulated results from 2-D cross-section modeling described in earlier sections. Figure 6-40 shows a rectangular solid region where the uranium mass was placed in the model for purposes of providing the "100:0" contaminant initial condition used for PRG determination, along with an observation well used for the PRG calculations. The background image is the simulated distribution of uranium mass representing 20 years of simulation, which started in year 1992 and thus represents the current distribution of uranium along the cross-section; but this is not the initial condition used for the SSL and PRG determination. The vertical extent of the rectangular region was guided by the vertical extent of uranium mass in the background image. The base of the rectangular region was placed above the top of the PRZ thereby distributing the uranium mass through the full contaminated thickness of the vadose zone. The width of the region was selected to be 30-m, which is deemed as a conservative zone of contamination along the flow direction under a given waste site in the 300 Area. It should be noted that the PRG calculations performed using this width can be linearly scaled if a different width of the contamination for a waste site is desired (geometric relationship). An observation well that is screened for 4.5 m (15 feet) is placed at the edge of the rectangular zone of contamination that extends down from the middle of the PRZ into the saturated zone. No other mass of uranium is placed in the cross-section except for that in the rectangular region shown in green in Figure 6-40. The average concentration along the 4.5 m screened interval of the observation well was calculated as a function of time to determine the peak concentration.

The calculations are performed by setting the initial uranium concentration to 1 mg/kg in the rectangular region and by conducting following five simulations using two sorption models (equilibrium sorption with spatially variable K_d and kinetic sorption with constant groundwater alkalinity) and three recharge scenarios (native vegetation, extended native vegetation, and industrial):

- **Equilibrium Sorption with Variable K_d and Native Vegetation Recharge Scenario** – recharge changes from current 55.4 mm/yr to 6 mm/yr after six years, and to 3 mm/yr after thirty years, due to changes in land cover from bare soil to mixed grass and mature shrub steppe vegetation cover, where it remains thereafter (using recharge basis from DOE/RL-2011-50 Rev. 1).



NOTE: Green rectangle indicates the zone to which a uniform contamination level was applied for purposes of developing the uranium PRG; the uranium contamination shown in the background is for reference only and does not represent the contamination initial condition used for PRG development.

Figure 6-40. Zone of Uranium Contamination Chosen for PRG Calculations

- **Equilibrium Sorption with Variable K_d and Extended Native Vegetation Recharge Scenario** – recharge remains at current value of 55.4 mm/yr for extended duration of 26 years (a conservative selection to maintain bare soil until the uranium peak has passed) and then changes to 6 mm/yr and then to 3 mm/yr after thirty years where it remains thereafter (using recharge basis from DOE/RL-2011-50 Rev. 1).

- **Kinetic Sorption with Constant Groundwater Alkalinity and Native Vegetation Recharge Scenario** – recharge changes from current 55.4 mm/yr to 6 mm/yr after six years, and to 3 mm/yr after thirty years, due to changes in land cover from bare soil to mixed grass and mature shrub steppe vegetation cover, where it remains thereafter (using recharge basis from DOE/RL-2011-50 Rev. 1).

- **Kinetic Sorption with Constant Groundwater Alkalinity and Extended Native Vegetation Recharge Scenario** – recharge remains at current value of 55.4 mm/yr for an extended duration of 26 years (a conservative selection to maintain bare soil until the uranium peak has passed) and then changes to 6 mm/yr and then to 3 mm/yr after thirty years, where it remains thereafter (using recharge basis from DOE/RL-2011-50 Rev. 1).

- **Kinetic Sorption with Constant Groundwater Alkalinity and Industrial Recharge Scenario** – recharge initially at 50 mm/yr for five years representing bare disturbed soil, and then linearly

transitions over a five-year period to 25 mm/yr representing cheat grass cover on disturbed soil, and remains at that rate thereafter (using recharge scenario defined by agreement with regulators).

- **Kinetic Sorption with Constant Groundwater Alkalinity and Irrigation Recharge Scenario** – recharge changes from current 55.4 mm/yr to 74.4 mm/yr after six years, and to 71.4 mm/yr after thirty years, where it remains thereafter. This simulation case represents irrigation applied as an additional infiltration to the native vegetation scenario rates, used for the purposes of calculating the SSL for uranium.

While the recharge for the above listed scenarios was modified from original simulations, the lateral boundary conditions were unchanged. The recharge modifications were assumed not to have a significant impact on the cyclic nature of water levels, which is reasonable given the controlling nature of the local river stage and regional flow system.

The simulated results are presented in Figure 6-41 through Figure 6-44 for the four native vegetation recharge scenario cases. These were calculated by averaging the concentrations observed at the nodes associated with the monitoring wells (to represent the appropriate groundwater dilution in well extracted water, consistent with the PRG approach utilized for other contaminants in ECF-300FF5-11-0153) and choosing only those nodes that showed full saturation. Comparing the results from the four native vegetation recharge scenario simulations (Figure 6-41 through Figure 6-44) indicate that the highest peak concentration (2.13 μg/L) is predicted by the Kinetic Sorption with Constant Groundwater Alkalinity and Extended Recharge Scenario case (Figure 6-44). The simulated results for the Kinetic Sorption with Constant Groundwater Alkalinity and Industrial Recharge Scenario case is shown in Figure 6-45. The simulated results for the Kinetic Sorption with Constant Groundwater Alkalinity and Irrigation Recharge Scenario case is shown in Figure 6-46.

Higher concentrations lead to lower PRG values, so the simulated case with highest peak groundwater concentration is preferred to provide a conservative PRG value. However, the extended native vegetation recharge scenario is excessively conservative in maintaining bare soil conditions for an extended time, and so is viewed as a sensitivity case and not as a basis for establishing a PRG value for non-industrial land use. The case with kinetic sorption with constant groundwater alkalinity and the native vegetation recharge scenario (consistent with the treatment of recharge as that used for PRG calculation for other analytes) was therefore selected as the basis for determining the PRG. The groundwater PRG is calculated to be 180 mg/kg in the native vegetation recharge scenario and 157 mg/kg for the industrial use recharge scenario. The surface water PRG is calculated to be 4,676 mg/kg in the native vegetation recharge scenario and 4,077 mg/kg in the industrial use recharge scenario.

The irrigation recharge scenario was applied to calculate the SSL values using the same sorption treatment (kinetic sorption with constant groundwater alkalinity) as it resulted in the highest peak groundwater concentrations, as was the case for the native vegetation cases. The groundwater SSL is calculated as 102 mg/kg and the surface water SSL is calculated to be 2,642 mg/kg.

If the excessively conservative extended recharge scenario had been chosen as a basis for the uranium PRG, the resulting values (117 mg/kg for groundwater PRG; 3,044 mg/kg for surface water PRG) would be lower than the values calculated for the industrial recharge scenario (157 mg/kg for groundwater PRG; 4,077 mg/kg for surface water PRG). This counter-intuitive result (because it might be reasonably assumed that a native vegetation scenario has lower recharge than the industrial scenario) is a function of the relationship of the recharge rate as a function of time in each of the recharge scenarios to the occurrence of peak uranium concentration in groundwater. Figure 6-47 illustrates the recharge rates for four cases in the key period of interest, the first 60 years, with comparison to the groundwater protection levels calculated under these scenarios. The time that the peak groundwater concentration occurs for each

scenario is indicated with a circle for reference. Observe that the recharge rate for the extended native recharge scenario is higher than the industrial scenario up to and during the time that the peak groundwater concentration occurs. This is because under the extended recharge scenario bare soil conditions persist in this period whereas the industrial scenario permits cheatgrass development, resulting in a somewhat lower recharge rate. Thus, for the key time (up to the time the peak groundwater concentration occurs), the extended native vegetation recharge scenario uses a higher recharge rate, and hence results in a lower PRG, than the industrial recharge scenario.

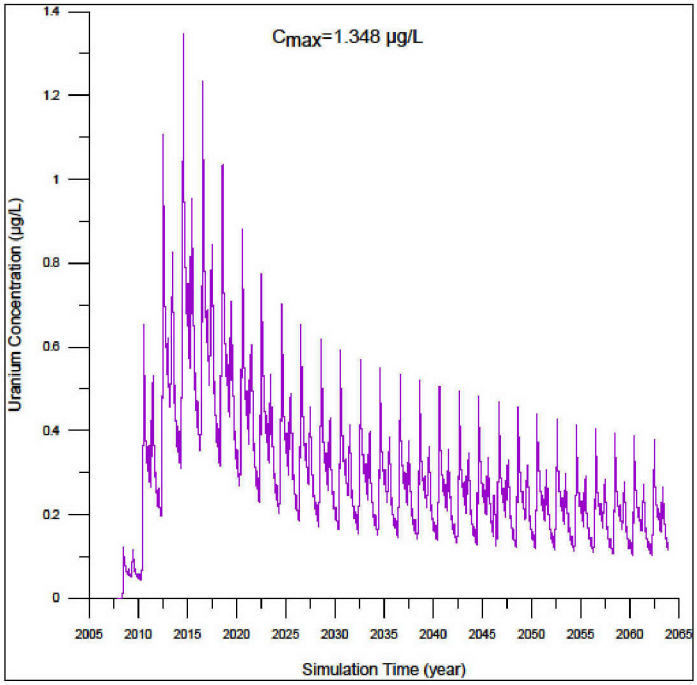


Figure 6-41. Simulated Average Uranium Concentration in the Observation Well for the Equilibrium Sorption with Variable K_d and Native Vegetation Recharge Scenario

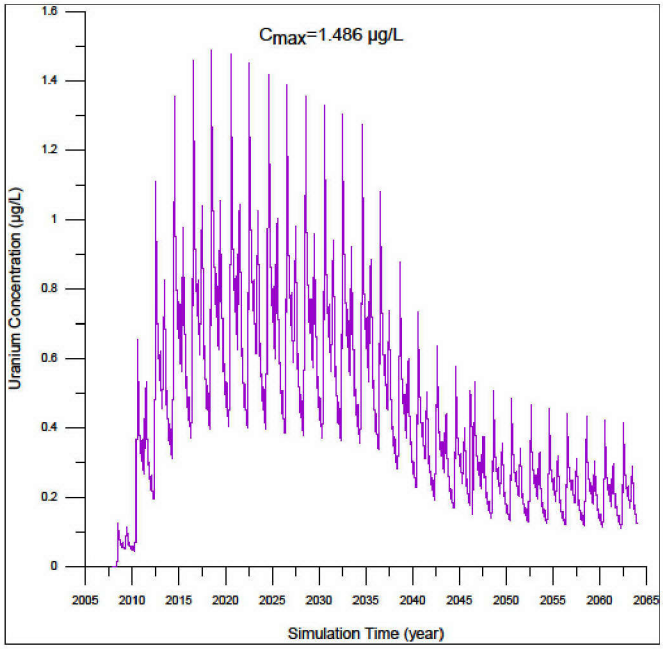


Figure 6-42. Simulated Average Uranium Concentration in the Observation Well for the Equilibrium Sorption with Variable K_d and Extended Native Vegetation Recharge Scenario

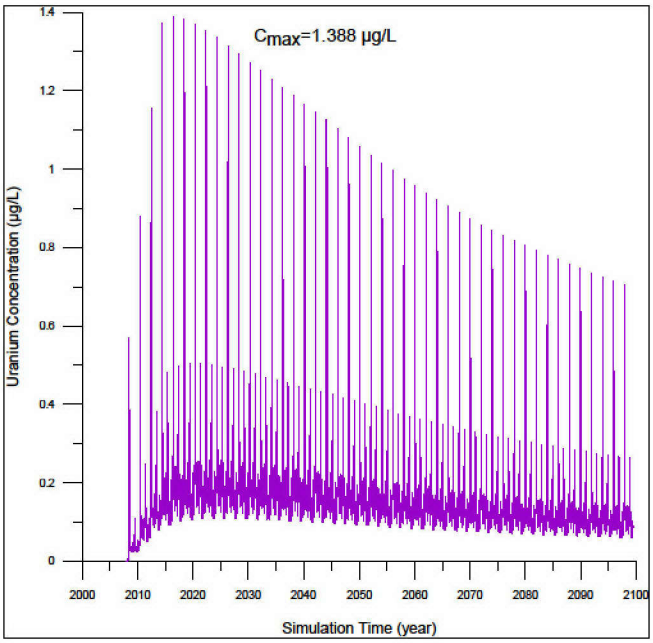


Figure 6-43. Simulated Average Uranium Concentration in the Observation Well for the Kinetic Sorption with Constant Groundwater Alkalinity and Native Vegetation Recharge Scenario

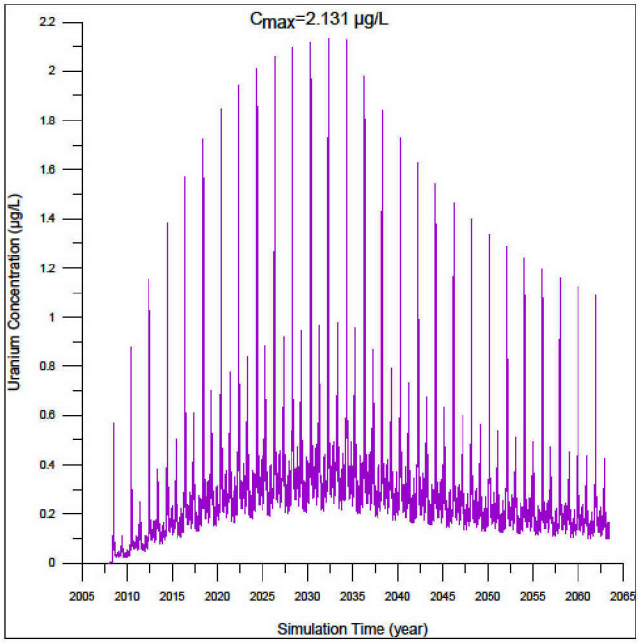


Figure 6-44. Simulated Average Uranium Concentration in the Observation Well for the Kinetic Sorption with Constant Groundwater Alkalinity and Extended Native Vegetation Recharge Scenario

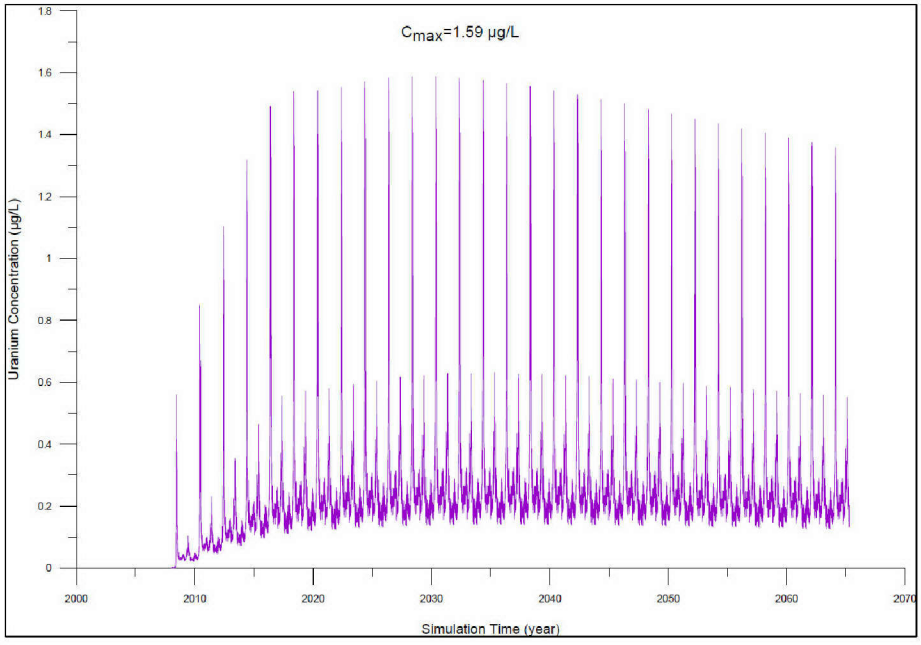


Figure 6-45. Simulated Average Uranium Concentration in the Observation Well for the Kinetic Sorption with Constant Groundwater Alkalinity and Industrial Recharge Scenario

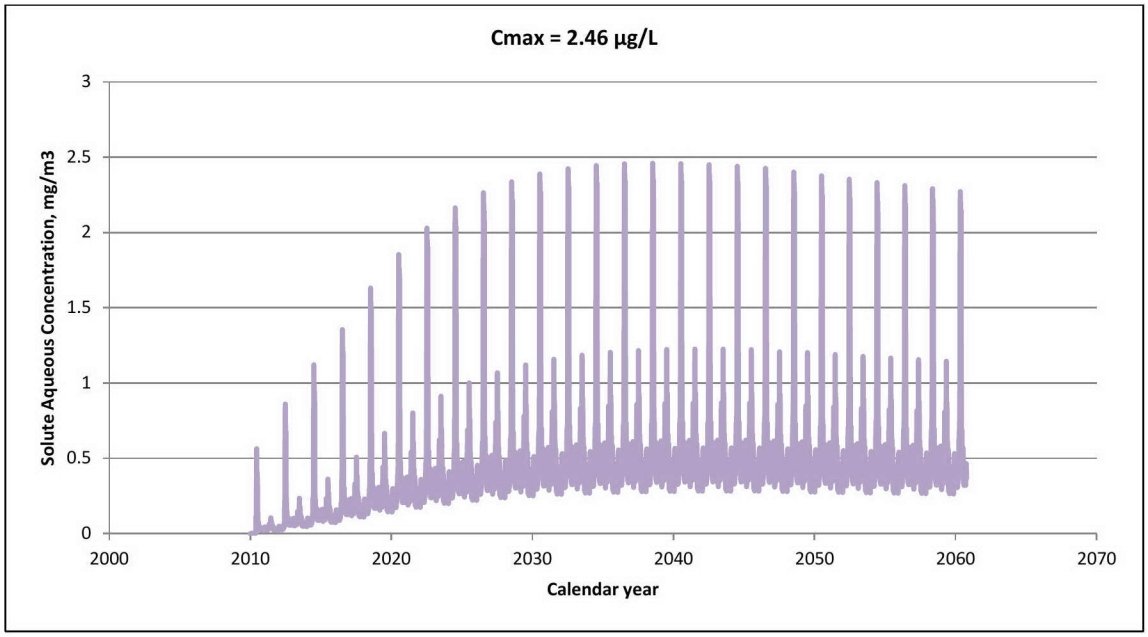


Figure 6-46. Simulated Average Uranium Concentration in the Observation Well for the Kinetic Sorption with Constant Groundwater Alkalinity and Irrigation Recharge Scenario

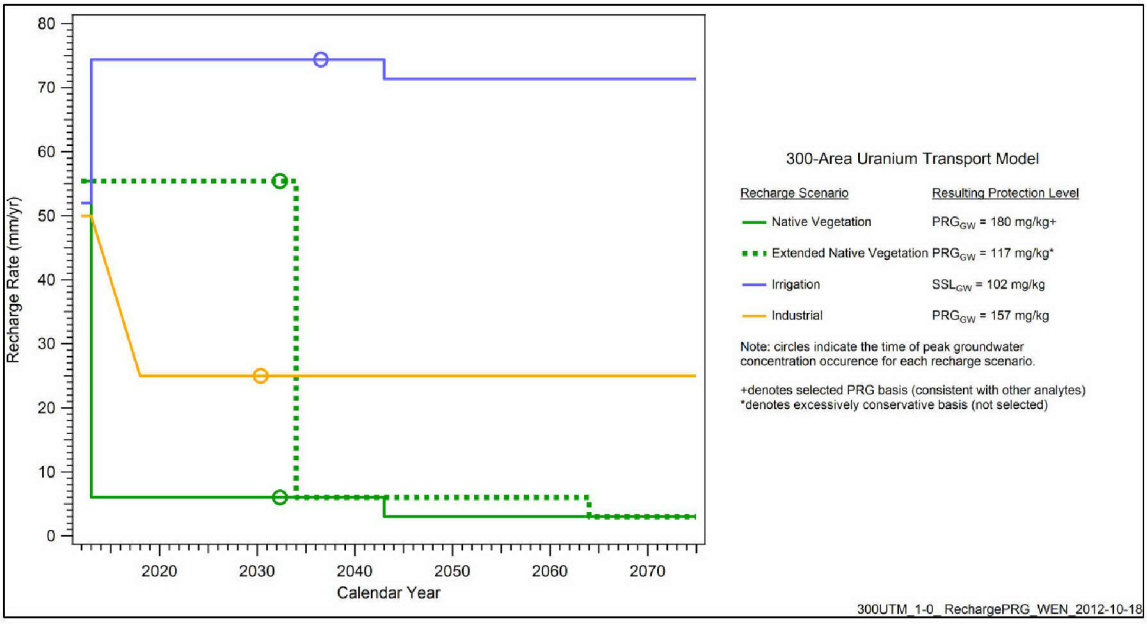


Figure 6-47 Recharge Rate Scenarios, Time of Groundwater Peak Concentration, and Resultant Protection Levels Calculated using the 300 Area 2-D Uranium Transport Model

These PRG calculations are applicable to the waste sites where the groundwater is not contaminated from lateral movement of dissolved uranium mass from surrounding areas and there is no influence from lateral movement of mass in the vadose zone from surrounding areas. This noted limitation is considered not to be a constraint on the use of the uranium PRG in the 300 Area for the following reasons:

1. The vast majority of the waste sites in the 300 Area do not reside over groundwater with elevated uranium contamination.
2. Due to the seasonality and trends of the uranium plume, only a few waste sites reside above the contaminated groundwater during a portion of the year.
3. Due to the length of time that it takes for the uranium contamination in the vadose zone to enter the groundwater, the uranium concentrations in the groundwater are predicted to be below DWS based on model results (that is, it takes longer for the vadose zone contamination to enter the groundwater than the groundwater to decline below the DWS).

These assumptions need to be re-evaluated after cleanup to confirm that PRGs do not need to be adjusted based on the initial SSL and PRG assumptions. The SSL and PRG calculations are based on 30-m width of the waste site along the groundwater flow direction. The SSL and PRG values should be linearly scaled if the width of the waste site being evaluated is different.

Sensitivity cases were also run with increased initial concentration in the vadose zone. The results (Figure 6-48 and Figure 6-49) indicated that the peak concentration can be linearly scaled based on the initial concentrations providing confidence in the approach for calculating the PRG. For example, Figure 6-48 shows the results for the Equilibrium Sorption with Variable K_d case with Extended High Recharge Scenario where the initial uranium concentrations were increased from 1 mg/kg to 10 mg/kg. The peak concentration is calculated to be 14.86 μg/L, which is exactly an order magnitude higher than that shown in Figure 6-42, indicating linear increase in peak concentration.

6.6 Sources of Uncertainty

It should be recognized that any modeling undertaken is simplification of reality and thus the modeling results need to be placed in the context of uncertainty in estimating the contaminant concentrations both spatially and temporally. A qualitative discussion of sources of uncertainty in developing flow and transport model is presented, which can be divided into four general areas: (1) uncertainty in the conceptual model; (2) uncertainty in representing initial spatial distribution of contamination ; (3) uncertainty in the values and variability of hydraulic and transport parameters; and (4) uncertainty in the resulting long-term predictions.

Uncertainty in conceptual model derives from limited available data. For example, the lithologic variability in three-dimensions is simplified in the model based on interpolation techniques using available data from limited locations. As a result the lithologic contacts between various units in the model are estimated and rely on the judgment of the modeler. Lithologic variations could exert primary control in modeling transport as the hydrologic properties are often lithology dependent. Determination of FEPs that need to be incorporated in a model are also generally based on conceptual understanding of the problem and having incomplete information can lead to errors in determining key FEPs, which can lead to inaccurate results. Conceptual uncertainties also exist in determining the boundary conditions for both the past and future conditions. The seasonal river stage fluctuations lead to changes in the flow direction within the aquifer. Due to natural variability the river stage fluctuations are hard to predict and add to considerable uncertainty in applying the boundary conditions that exert significant control on the mobility

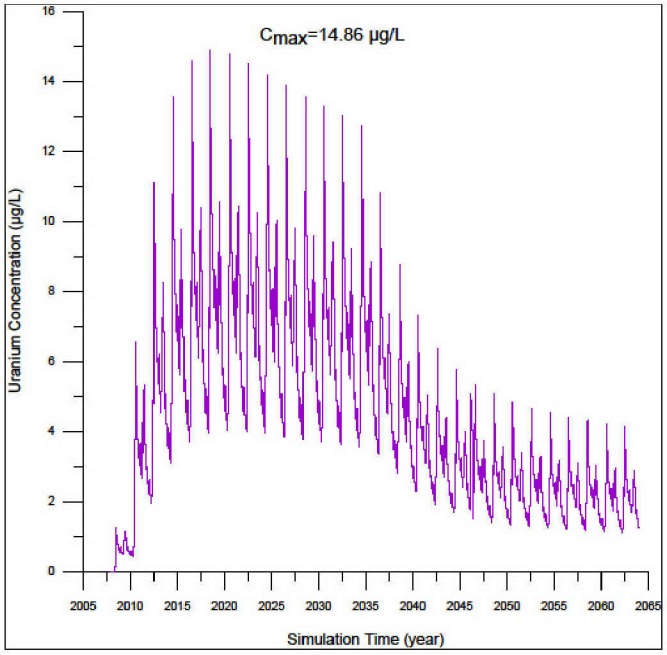


Figure 6-48. Simulated Average Uranium Concentration in the Observation Well for the Equilibrium Sorption with Variable K_d Case with Extended High Native Vegetation Recharge Scenario where the Initial Soil Concentration is set at 10 mg/kg

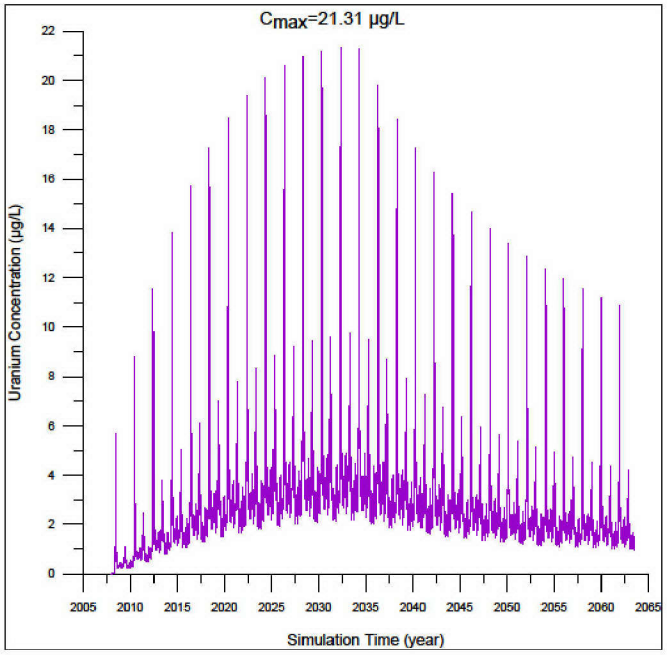


Figure 6-49. Simulated Average Uranium Concentration in the Observation Well for the Kinetic Sorption with Constant Groundwater Alkalinity Case with Extended High Native Vegetation Recharge Scenario where the Initial Soil Concentration is set at 10 mg/kg

of uranium. Considerable variability in the flow direction also exists spatially within the same time frame as well between the seasons. Without having complete information the predominant flow paths have to be conceptualized. To evaluate the influence of mixing of river water and groundwater near the south end of Process Trench (that had high uranium dissolved concentration), 2-D cross-sectional modeling along predominant flow paths was planned to be performed separately for June and December transects (although only the June model was ultimately used). These two months encompass the range in flow path variation and thus evaluating the effect of mixing among these flow paths can lead to understanding of uranium transport over time. However, because of changing flow paths the dissolved uranium is likely to be spread in the southerly direction during December and move closer to the river due to lower river stage.

Developing initial distribution of uranium concentration in soil from limited spatial data set also leads to uncertainty in applying the initial conditions in the model. It gets even more challenging when limited data is available and where datasets from different years have to be combined to understand the distribution of uranium in the soil. Another issue with estimating the initial distribution is how far a sample result can be extrapolated away from its location. The use of radial basis functions as a mechanism for interpolation can reduce but cannot eliminate uncertainty due to sparse sampling as they do not represent the physics of the processes that caused contaminants to migrate in the subsurface. To reflect the influence of fluid flow direction on contaminant distribution shape, a bias in 3-D plume generation algorithms was introduced by making the variogram longer in the average direction of horizontal flow than in other directions and shortest perpendicular to this direction. Also, a cutoff depth of the soil concentration was judged based on the hydraulic conductivity of the units. A particular problem with using radial basis functions to define contaminant distributions is that the interpolant is symmetric with respect to the measurement point in all directions and thus requires conceptual understanding on the geometry of the plume. One of the reasons for using control points was to reduce the influence of this limitation.

The assumption of spatially invariant hydraulic properties of the HSUs is also a source of uncertainty. The fluvial environments that lead to deposition of most of the sediments for the aquifer are associated with heterogeneous structures, especially for the Hanford formation and Ringold Formation. Local variations in hydraulic properties can cause local regions of relatively large flow rates and hence faster transport of contaminants. Heterogeneity in the form of sand lenses, bar structures, and over bank deposits are common at meter to tens of meter scale and may never be detected as they could occur between the borehole locations. These heterogeneities can cause large variations in hydraulic conductivities, which may not be in the model. Furthermore, some of these features can create larger scale preferential pathways and lead to faster contaminant movement locally than predicted by the current model.

As advection is the primary transport mechanism in the current modeling study, the transport parameters of interest are primarily effective porosity, bulk density, longitudinal and transverse dispersivity, and sorption related parameters such as kinetic rate constant and K_d. These parameters are used to determine the retardation factor that is applied for uranium. Only best estimate values (most representative and appropriate for current modeling task) are considered in the modeling study because of lack of available information on spatial variability of these parameters. The anisotropic ratio for longitudinal and transverse hydraulic conductivity and dispersivity is also estimated as a single value due to lack of available information. This can also lead to uncertainty in predicting transport of uranium.

The sorption/desorption of uranium can be described by kinetic rate constant when equilibrium conditions are not established due to dynamic flow through the aquifer and changing geochemistry as a result of mixing of river water with groundwater. Alternatively, if the equilibrium conditions are assumed, such as away from the source areas, the K_d values can be applied. In both cases, the values can vary over a range

as they depend primarily on the available sorption sites on the sorbent (function of surface area), dissolved concentration of contaminant, and chemical parameters such as pH, alkalinity, and ionic strength. Each of these parameters can vary over time and space and affect the sorption of the contaminant and, thereby, the uncertainty in its estimate. The <2 mm grain size fraction affects the number of available sorption sites. In the calculations the <2 mm grain size fraction is held constant but in reality it would vary and thereby affect the sorption of uranium. Similarly, the labile fraction of uranium is considered to be constant for the purpose of modeling but would vary spatially based on the binding energy of the sorption site and the uranium aqueous complexes present.

6.6.1 Sensitivity Studies

Several sensitivity cases were evaluated, as listed in Table 6-3. These include: (a) sensitivity to hydrologic parameters (discussed in Section 6.6.1.1), (b) sensitivity case for uranium transport using variable kinetic rate (discussed in Section 6.6.1.2), and (c) sensitivity to higher Columbia River stage (discussed in Section 6.6.1.3). The *MAE* and *B* statistics (defined in Section 0) were used to evaluate the hydrologic parameter sensitivity cases. For variable kinetic rate and Columbia River stage sensitivity cases, the time to MCL was used to evaluate the cases.

Table 6-3. Sensitivity Cases

Sensitivity Case #	Category	Parameter of Interest	Change to Parameter	Purpose
1	Sensitivity to River Stage	River stage	Apply historic pre-dam stage to boundary	Predictive model; sensitivity of time to MCL
2(a)	Sensitivity to Hydraulic Parameters	Hanford formation hydraulic conductivity	Increase to 12000 m/d	Calibration metrics sensitivity (hydraulic and transport)
2(b)			Decrease to 6000 m/d	
3(a)		van Genuchten parameter set	Use values from PNNL-21214	
3(b)			Use values used for PRG development in ECF-300FF5-11-0153 Rev. 2	
4		Hydraulic conductivity anisotropy ratio	0.1	
5(a)		Dispersivity	In VZ, 1/10	
5(b)			In SZ/PRZ, 1/10	
6	Sensitivity to Spatially Variable Alkalinity	Sorption coefficient (K_d)	Spatially distributed K_d	Predictive model; sensitivity of time to MCL Calibration metrics sensitivity (transport)

6.6.1.1 Hydrologic Parameter Sensitivity

Hanford Formation Saturated Hydraulic Conductivity (K_s). The Hanford formation has high permeability across the Hanford Site, and its permeability may be highest in the 300 Area. In comparison

to the calibrated model, sensitivity cases considered for sensitivity to K_s; a higher (Case 2a_Ks1, 12,000 m/d) and a lower (Case 2a_Ks2, 6000 m/d) estimate. The higher K_s (12000 m/d) case was used to explore the effect of permeability of the order of magnitude found in several 300 Area aquifer tests; the mixing zone extended much farther inland in this case. Because the river water chemistry is distinctly more dilute than typical aquifer water chemistry, water flux and river/groundwater mixing zone dynamics are critical modeling issues for uranium transport, whose mobility is sensitive to changing solution chemistry. As expected, the lower-K_s (6000 m/d) case resulted in less penetration inland of the mixing zone. Similar to statistics for the calibrated model, the *MAE* values for both head and EC are low for all three wells (Cases 2a_Ks1 and 2b_Ks2). The hydraulic head bias (simulated - observed) for all three wells is also low – similar to those for the calibrated model. The EC bias, however, is considerably larger especially for well 399-2-2 (Cases 2a_Ks1 and 2b_Ks2); this is true also for the calibrated model EC for the same well.

van Genuchten Parameters. For the 300 Area modeling domain considered in this work, only the sediments in the Hanford formation have the potential of being variably saturated. The lack of an adequate database for the 300 Area sediments' moisture retention and unsaturated hydraulic conductivity limits application of upscaling techniques to quantify the spatial variability of van Genuchten parameters used in the base case. Therefore, in the absence of upscaled parameters, the sensitivity for the van Genuchten parameters was evaluated using the PNNL and PRC model data (Cases 3a_PNNL and 3b_PRG). For reference, the PNNL and PRG van Genuchten parameters are listed in Table 6-5; the Hanford formation parameter variability was considered and the Ringold unit parameters were kept identical to those used in the calibrated model.

Again, the *MAE* estimates for both head and EC are low for all three wells (Cases 3a_PNNL and 3b_PRG). The hydraulic head bias (simulated - observed) for the three wells is also low, and is of the same magnitude as the bias for the calibrated model. Again, as with other sensitivity cases, the EC bias is considerably larger especially for well 399-2-2 (Cases 3a_PNNL and 3b_PRG); this is true for the calibrated model EC for the same well.

Hanford formation Anisotropy. Because of the highly gravelly nature of Hanford sediments, anisotropy (ratio of saturated hydraulic conductivity parallel to geologic bedding to that perpendicular to bedding) is expected to play less of a role on contaminant migration in 300 Area, compared to sediments in 200 Areas. For the 10:1 (horizontal: vertical) anisotropy (Case 4_anisotropy) for the Hanford sediments, the hydraulic head bias (simulated - observed) ranged from 0.0262 to -0.0374 m for the three wells (Case 4_anisotropy). The EC bias (simulated - observed) estimate ranged from -0.0015 to -0.1781 for the 3 wells, with well 399-2-2 again yielding the largest bias in EC (Case 4_anisotropy).

Longitudinal Dispersivity. The explicit inclusion of dispersion in the transport model effectively enhances mixing of the river tracer in the saturated Hanford Gravel/Sand unit and spreading into the much less permeable Ringold Sand/ Silt sediments, where it persists. In the absence of dispersion, the migration of river tracer into the Ringold Sand/Silt unit is significantly reduced. This behavior is more consistent with observations in multilevel and depth-discrete sampling in the aquifer in the 300 Area (PNNL-17034) that indicate minimal groundwater exchange across the Hanford/Ringold contact. Again, the MAE values for both head and EC are low for all three wells (Cases 5a_Dispersivity and 5b_Dispersivity). The hydraulic head bias (simulated - observed) for the three wells is also low, and is of the same magnitude as the bias for the calibrated model. Again, as with other sensitivity cases, the EC bias is considerably larger especially for well 399-2-2 (Cases 5a_Dispersivity and 5b_Dispersivity); this is true for the calibrated model EC for the same well.

Table 6-4. Mean Absolute Error and Bias Estimates for Hydraulic Head and Electrical Conductivity for the Calibrated Model and Sensitivity Cases

Well	Hydraulic Head (m)			EC (Normalized Electrical Conductivity)		
	Count	*MAE*	*B*	Count	*MAE*	*B*
Calibrated Model						
399-1-7	1623	0.1070	-0.0254	1776	0.05328	-3.22E-03
399-1-17A	1392	0.0656	0.0481	1386	0.0670	-4.12E-02
399-2-2	1790	0.1181	0.0424	1790	0.1772	-1.73E-01
Sensitivity Case 2a (Ks1)						
399-1-7	1573	0.1007	-0.0278	1722	0.0581	0.0033
399-1-17A	1339	0.0653	0.0484	1339	0.0771	-0.0277
399-2-2	1736	0.1096	0.0409	1736	0.1673	-0.1617
Sensitivity Case 2b (Ks2)						
399-1-7	1567	0.1093	-0.0321	1721	0.0416	-0.0252
399-1-17A	1334	0.0627	0.0446	1334	0.0685	-0.0608
399-2-2	1735	0.1203	0.0353	1735	0.1880	-0.1871
Sensitivity Case 3a (PNNL)						
399-1-7	1743	0.1010	-0.0166	1910	0.0453	-0.0113
399-1-17A	1523	0.0692	0.0521	1499	0.0640	-0.0487
399-2-2	1924	0.1151	0.0517	1924	0.1878	-0.1857
Sensitivity Case 3b (PRG)						
399-1-7	1653	0.1062	-0.0232	1809	0.0527	-0.0011
399-1-17A	1422	0.0648	0.0378	1365	0.0688	-0.0430
399-2-2	1823	0.1166	0.0438	1823	0.1675	-0.1629
Sensitivity Case 4 (Anisotropy)						
399-1-7	1780	0.1059	-0.0374	1928	0.0553	-0.0015
399-1-17A	1541	0.0642	0.0289	1504	0.0688	-0.0457
399-2-2	1942	0.1141	0.0262	1942	0.1799	-0.1781
Sensitivity Case 5a (Dispersivity)						
399-1-7	1625	0.1063	-0.0273	1773	0.0522	-0.0051
399-1-17A	1391	0.0646	0.0478	1381	0.0678	-0.0435
399-2-2	1787	0.1156	0.0408	1787	0.1728	-0.1688

Table 6-4. Mean Absolute Error and Bias Estimates for Hydraulic Head and Electrical Conductivity for the Calibrated Model and Sensitivity Cases

Well	Hydraulic Head (m)			EC (Normalized Electrical Conductivity)		
	Count	*MAE*	*B*	Count	*MAE*	*B*
Sensitivity Case 5b (Dispersivity)						
399-1-7	1625	0.1063	-0.0273	1773	0.0600	-0.0041
399-1-17A	1391	0.0646	0.0478	1381	0.0699	-0.0498
399-2-2	1787	0.1156	0.0408	1787	0.1895	-0.1854

Note: highlighting reflects whether the calibration metric improved (green) or degraded (red) compared to calibrated model basis.

Table 6-5. van Genuchten Parameters for the Hanford formation for the PNNL and PRG Sensitivity Cases

van Genuchten Parameter	Hanford formation (PNNL Values)[a]	Hanford formation (PRG Values)	Ringold fine grained	River alluvium
n_D diffusive porosity (m3/m3)	0.167	0.167	0.177	0.177
α van Genuchten water retention function inverse air entry matric potential (1/cm)	0.01	0.082	0.008	0.008
n van Genuchten water retention function exponential fitting parameter (dimensionless)	1.70	2.093	1.66	1.66
s_r residual saturation (dimensionless)	0.09	0.152	0.147	0.147
m Mualem relative permeability function fitting parameter (dimensionless)	$m = (n\text{-}1)/n$			
β Mualem relative permeability function exponential term	0.5			

[a] PNNL-21214, 2012, Numerical Modeling of ^{90}Sr and ^{137}Cs Transport from a Spill in the B-Cell of the 324 Building, Hanford Site 300 Area.

Section 6.6.1.2. Spatially Variable Alkalinity Sensitivity

A kinetic sorption model based on spatially variable alkalinity from mixing of river water with groundwater was evaluated in the context of performing sensitivity analysis on uranium transport. A recent modification to STOMP code added the capability of spatially varying kinetic rate, which was not available in the previous version with which most simulations were performed for this calculation, as noted in Section 5.1.2. A simplistic analysis was performed to evaluate the sensitivity of applying a

spatially variable kinetic rate using the newly available feature in STOMP. In this evaluation an approach similar to that taken by the equilibrium sorption with spatially variable alkalinity was evaluated (Section 5.1.2). The spatially variable alkalinity from mixing of river water with groundwater and pore water was evaluated at 29 time intervals over the two-year repeating cycle. The spatially and temporally variable K_d calculated for the Equilibrium sorption model (based on spatially variable alkalinity for the 29 time intervals) was used to calculate the forward reaction rate constant, thereby generating a corresponding set based on Equation 5. For the current sensitivity, the backward (desorption) reaction rate constant was not varied and left fixed at 5×10^{-4} hr^{-1} (as discussed in Section 3.5.2). This resulted in forward reaction rate constant that varied from 9.3×10^{-3} to 2.8×10^{-2} hr^{-1}.

The results are presented in Table 6-6 for three wells located along the cross-section and compared with the kinetic sorption with groundwater alkalinity case in terms of time to reach MCL for the mean concentrations and for the 95th UCL on the mean concentrations. Both calculations are performed using the native vegetation recharge scenario which generally results in longer times to MCL than the industrial recharge scenario (Table 6-2). The results indicate that the time to reach MCL increases in this sensitivity case. This is to be expected because the forward reaction rate constant in the sensitivity case is variable (9.3×10^{-3} to 2.8×10^{-2} hr^{-1}) and larger than the value of 9.3×10^{-3} hr^{-1} used for the kinetic sorption with groundwater alkalinity case. It should be pointed out that for the majority of the simulated duration the forward reaction rate constant is near the low value of 9.3×10^{-3} hr^{-1}, as groundwater alkalinity dominates through the aquifer, but increases with increasing influence of river water thereby leading to greater degree of sorption.

In this simplified analysis, the backward (desorption) reaction rate is not allowed to vary, which is not realistic given that there is uncertainty in the desorption rates. Thus the results of this sensitivity analysis should not be considered as fully representative of the conditions in the aquifer.

Table 6-6.Time to Reach MCL for the Uranium Transport Sensitivity Case

Well	Time to Reach MCL (in Years from Jan 1, 2012) For Native Vegetation Recharge Scenario			
	Kinetic Sorption with Groundwater Alkalinity		Sensitivity Case: Kinetic Sorption with Spatially Variable Alkalinity	
	Mean	95th UCL	Mean	95th UCL
399-1-17A	13	20	30	35
399-1-7	12	15	30	33
399-2-2	25	30	37	40

6.6.2 Columbia River Stage Sensitivity

The Columbia River exerts significant control on the water table elevation in the 300 Area. Modeling of future uranium concentrations discussed in this calculation is based on present-day river stages, and does not account for potential changes to future river management such as might occur under the Columbia Basin Treaty, which can potentially transfer flood control responsibilities for the Columbia River in the future from Canadian dams to those of the United States (Figure 6-50). United States dams, primarily Grand Coulee Dam, might be operated in such conditions to mitigate this change in part or in whole; nevertheless, the question of how uranium concentrations would respond in the future in the face of less flood control management of the Columbia River is considered here.

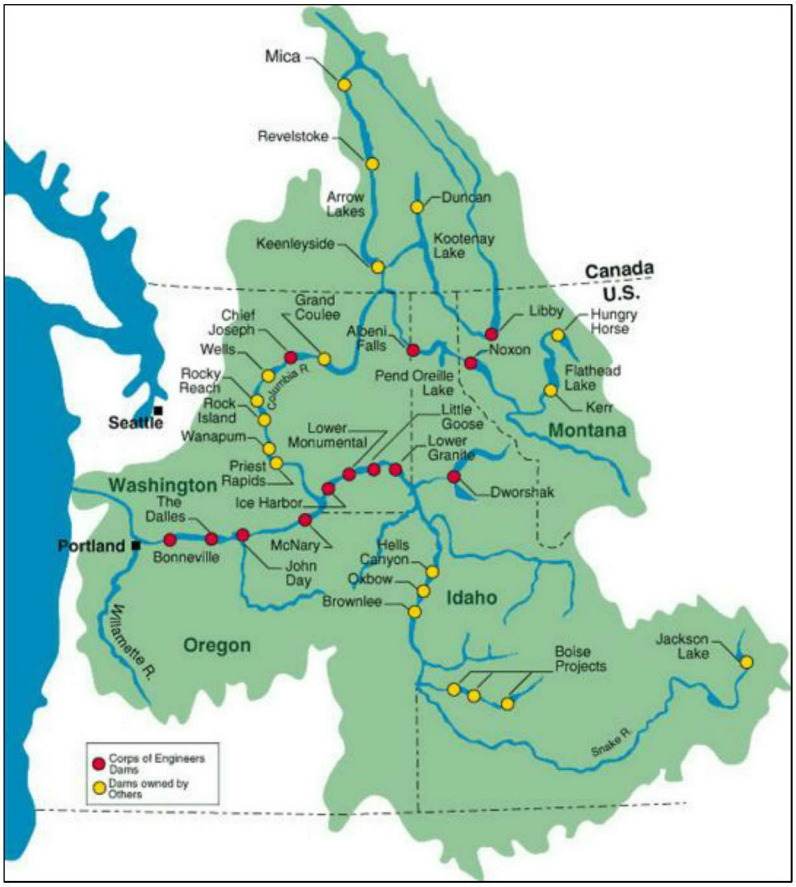
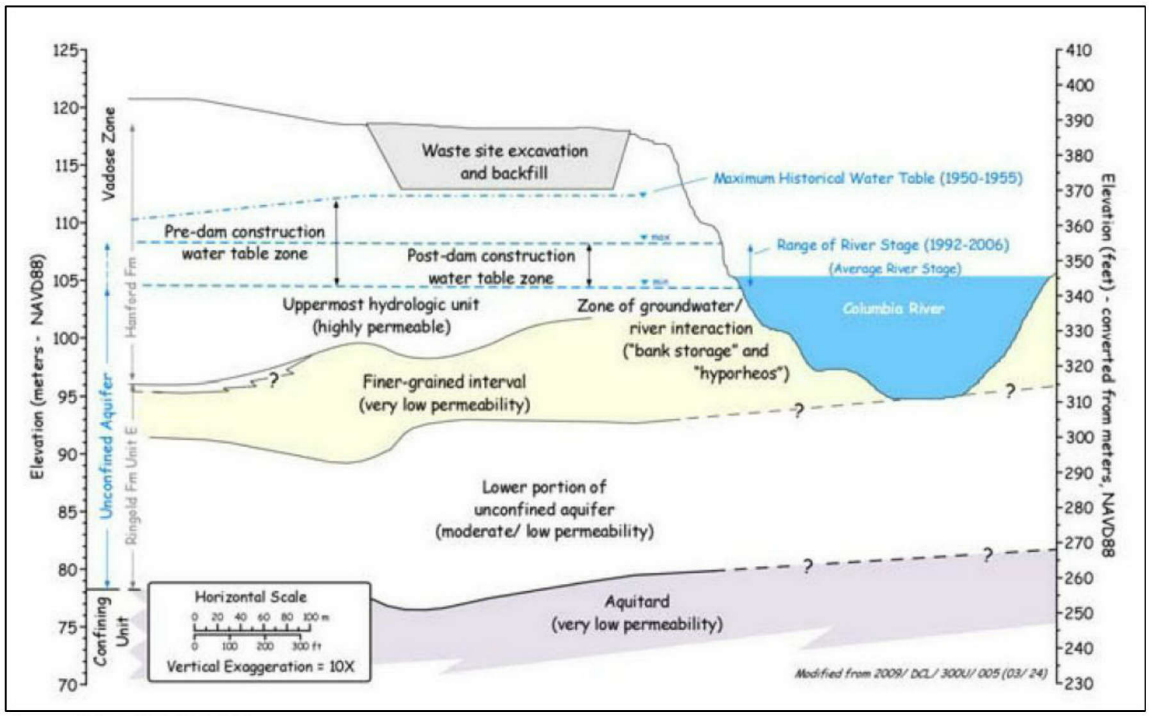


Figure 6-50. Columbia River System Dams

Actual river stages under a posited future with less flood control of the Columbia are, of course, not available in the present, nor are related groundwater stage data to calibrate or test a groundwater model of the 300 Area against such conditions. The one analog available is to consider river stages in the pre-dam era when less flood control was applied, e.g., PNNL-15226, *Hydrodynamic Simulation of the Columbia River, Hanford Reach, 1940-2004*. The Priest Rapids and Wanapum dams, the two dams located immediately upstream of the Hanford Reach, were constructed in the early 1960s. Before this time, the Columbia River high-water stage in 300 Area was much higher than occurs in the present day. Figure 6-51 illustrates the range in Columbia River stage and the range in water table elevations inland of 300 Area, prior to and following construction of dams. Historical data on Columbia River stages and water table elevations inland are considered below.



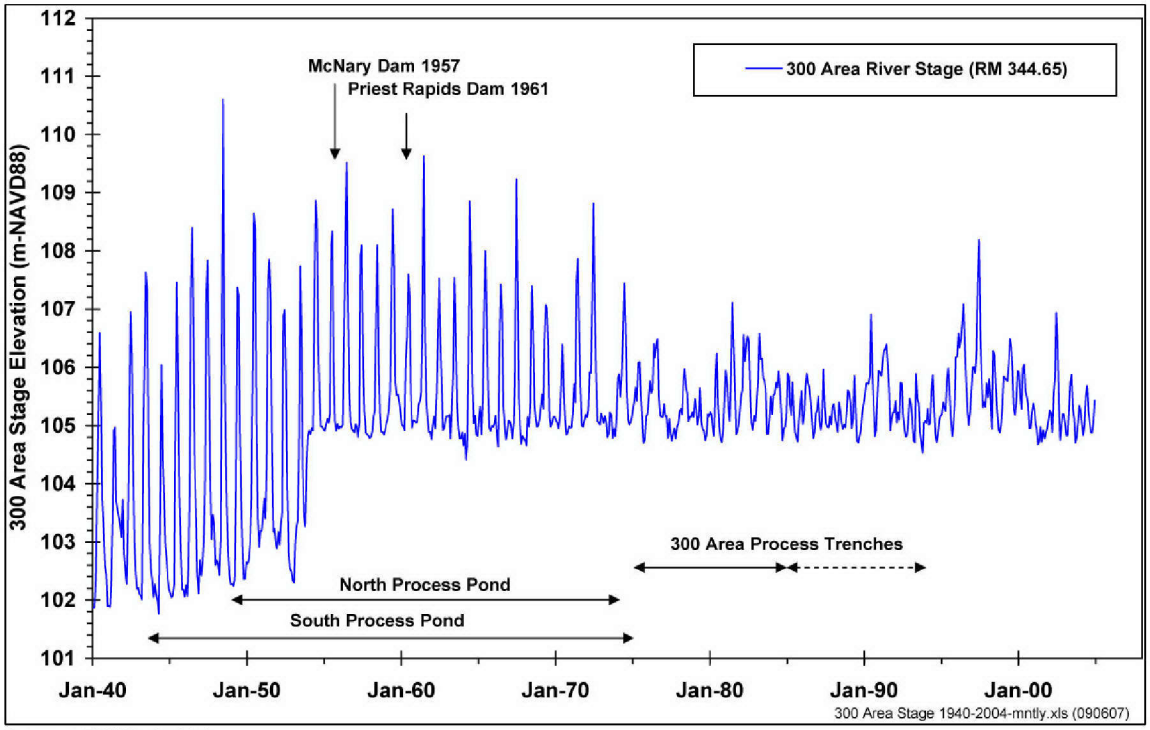
Source: PNNL-SA-69353

Figure 6-51. Schematic Illustrating Historical Data on Pre- and Post-construction of Columbia River Stage and Water Table Elevation Ranges in 300 Area

For the current (post-dam) condition, uranium mobility is complicated by the rise and fall of the river stage, especially during the period of seasonal high-river discharge in the spring and early summer months. Inland transport above the average water table is driven by higher river stage and increases with proximity to the river. Conversely, net flow below the average water table is toward the river and driven by lower river stages.

During the pre-dam and early operations period (1940s, 1950s, and 1960s), high-river-stage conditions created a hydraulic gradient that caused groundwater plumes to move inland from their positions under more typical gradients and river stages (PNNL-17034). Depending on the length of time that the hydraulic gradient was reversed, groundwater plumes may have been pushed inland in excess of 1 km and as far as the Stevens Drive on the west (PNNL-17034).

In addition, as Figure 6-52 illustrates, prior to construction of McNary Dam and Priest Rapids Dams, for example, seasonal ranges in Columbia River stage elevation were much greater than the post-dam river elevations (PNNL-15226). Also, periodic floods in pre-dam years, such as the very significant 1948 flood event which inundated Kennewick and Richland in the worst flood in the history of those two cities, significantly impacted groundwater conditions near the river. The water table beneath the 300 Area would be elevated well above typical current levels during these high-river stages, thus pushing contaminated groundwater upward into the lower vadose zone and a considerable distance inland.



Source: PNNL-17034

Figure 6-52. Columbia River Stage Elevation at 300 Area from 1940 to 2004

Also, for high river stages, the contrast in river water and groundwater chemistry plays a significant role. The river water specific conductance is a relatively constant value of ~130 µS/cm, whereas the 300 Area groundwater conductance ranges from 350 to 450 µS/cm. During the high-river conditions in the spring, bank storage of river water is revealed by the contrast in quality as well as by the reduction of uranium concentration by dilution. A band of relatively low concentrations near the river appear in June maps, compared to the December maps. The correlation between uranium concentrations and water levels in wells near the river is just the opposite of that observed in wells farther inland.

Using the past as a guide, we infer that potentially higher future river stages would result in even lower concentrations in wells along the river but would also create saturated conditions inland, remobilizing dissolved contaminants, and creating a hydraulic gradient away from the river for the plume to move farther inland laterally within the highly transmissive Hanford formation (refer to Figure 6-51). With the river water having a lower specific conductance and lower alkalinity (lower bicarbonate) compared to 300 Area groundwater, the high-volume river-water intrusion will likely promote adsorption of uranium onto sediments. This is supported by the work done in 1990's following the expedited response action (ERA) for the 300 Area Process Trenches. Following the ERA, clean water with low alkalinity continued to be discharged, which promoted the retention of uranium on aquifer solids (PNNL-17034).

It should be noted that the six dams downstream of Grand Coulee Dam and upstream of the Hanford Site (Chief Joseph, Wells, Rocky Reach, Rock Island, Wanapum, and Priest Rapids Dams; Figure 6-50) are 'run of the reach dams,' signifying that these dams lack a significant range in storage capacity to hold substantial flood waters and therefore must allow such waters to pass downstream, as witnessed in the most recent flood event in 1997. Grand Coulee Dam, in contrast, is a high dam with substantial storage capacity, and to permit a significant flood today, Grand Coulee Dam would have to be managed to allow

a flood, or dam failure would have to occur. The consequences of a failure of Grand Coulee Dam would be far-reaching for the Hanford Site and for all areas downstream of Grand Coulee Dam, well beyond considerations of 300 Area uranium mobility and meeting the MCL.

Performing a sensitivity study that includes river stages representative of flood stages on the scales discussed above is inappropriate with the calibrated model developed for this calculation because the range of water elevations to which the model is calibrated does not include such conditions. To develop an indication of the response of this system to reduction of flood control in Columbia River management, two sensitivity cases were prepared that operate within calibration range of the model to provide indication of the sensitivity of response of the time-to-MCL estimates to river stage. The two cases take advantage of the biennial cycle of river stage data used in the model (calendar years 2008 and 2009) by noting that the 2008 exhibits higher stages generally than 2009 (Figure 3-7). A higher stage case is made by repeating the 2008 river stage in an annual cycle. The difference in time-to-MCL for this sensitivity case provides a limited indication of the impact of higher, or lower, river stages.

The results of these higher and lower stage cases are shown in Table 6-7. For the higher stage case, the times to MCL under all statistics are lower. This suggests that higher river stages, with the associated greater inflow of river water into the system, higher water table elevations, and greater liberation of uranium from the PRZ, results in faster attainment of MCL.

Table 6-7. Columbia River Stage Sensitivity Results

Case	Well	Time to Maximum Contaminant Level (MCL)			
		Maximum	95th UCL	90th Percentile	Mean
No Action, Industrial Recharge Scenario (repeats 2008 and 2009 river stage data biennially)	399-1-17A	>180	16	28	14
	399-1-7	45	20	25	20
	399-2-2	32	25	25	25
High Stage Case (repeating 2008 river stage annually)	399-1-17A	>120	15	39	16
	399-1-7	38	22	31	21
	399-2-2	33	27	30	27

Note: highlighting reflects approximate direction of impact of higher stage case compared to no action, industrial recharge scenario base case for each statistic (green is reduction in time to MCL; red is increase; orange is approximately no change; most restrictive well is the result highlighted).

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Attachment A

Uranium in Sediment from FS-2 Test Pit, 618-1 Burial Ground Excavation

Uranium in Sediment from FS-2 Test Pit, 618-1 Burial Ground Excavation

R. E. Peterson, Pacific Northwest National Laboratory
June 30, 2010

Introduction

Washington Closure Hanford provided Pacific Northwest National Laboratory with the analytical results for sediment samples collected in profile from a test pit within the larger excavation associated with the former 618-1 Burial Ground. Fourteen samples were collected on April 20, 2010 using an excavator. Total uranium, isotopic uranium, and pH were measured for each sample. The excavation did not reach groundwater, although the deepest sample was probably collected close to the water table on that day.

Detailed information on sample collection is available in the 300-FF-2 Field Remediation Project—Sampling Log (EL-1395-16, pp. 10 - 11), including sample numbers, collection time, coordinates, and estimated elevations for each sample. Uranium analyses of samples were performed on May 7 and 10, 2010, by Eberline Analytical/ Richmond, under Sample Delivery Group K2028, and reported on May 12. Sample pH was determined by Lionville Laboratory on April 23, 2010 and reported on April 28.

Total uranium in solids was measured by method UTOT_KPA; isotopic uranium was measured by method UISO_PLATE_AEA and included U-233/234, U-235, and U-238; and pH was measured using method SW846 9045D. Field estimates for the elevation of the sample were adjusted using hourly water level data from nearby wells. The adjustment included moving the profile upward such that the deepest sample, which was not saturated, was positioned just above the water table elevation for the time of sampling.

Results

Laboratory results are summarized in the table below, along with elevation estimates. The uranium and pH profiles are shown graphically in the figure. Water table elevations were determined from hourly records for nearby wells 399-1-21A and 399-1-2, courtesy of Kyle Parker (PNNL) and the Integrated Field-Scale Research Challenge project.

Discussion

For perspective, the uranium concentrations measured in samples from the test pit are similar to those typically measured in cleanup verification samples collected at the three major liquid waste disposal sites. The pH of the sediment is much lower, however, indicating that neutralization of the waste acid effluent disposed at this location was not complete.

The concentrations shown in this profile are higher than those in profiles obtained during characterization drilling at other locations in the 300 Area. During the limited field investigation for uranium (PNNL-16435) and a subsequent volatile organic compound investigation (PNNL-17793), drilling at locations relatively near to the 618-1 site produced lower values for uranium in vadose zone sediment. Those locations are now monitoring wells 399-3-19, 399-2-5, and 399-3-22. Uranium concentrations for comparable depth horizons at those locations are an order of magnitude or more lower than at the acid pit site. However, one feature common to the pit site and three characterization borehole sites is a relative increase in concentrations in samples collected near the water table.

The acid neutralization pit profile may be a unique occurrence at the 300 Area, with regard to contaminant uranium remaining in the vadose zone. The implications for impacts to groundwater are not fully developed at this point, but the data will be interpreted in more detail as the 300 Area remedial investigation continues, leading to conclusions in the remedial investigation/feasibility study report. Also, planned drilling location #3 (C7659), as described in the 300 Area RI/FS Work Plan (DOE/RL-2009-30), will be located close to the south end of the former 618-1 burial ground, and samples collected from the vadose zone during drilling will provide additional detailed information on contamination in the vicinity of the FS-2 test pit.

Sample No.	Sample Depth (ft-bgs)	Field Record: Estimated Elevation (m-NAVD88)	"Adjusted" Elevation (m-NAVD88)	pH	Total Uranium (ug/g)	U-233/234 (pCi/g)	U-235 (pCi/g)	U-238 (pCi/g)	Total Uranium Calculated from Isotopes (ug/g)
J19XD1	2	111.5	113.5	4.39	143.0	46.2	3.4	43.3	130.3
J19XD2	4	111.0	113.0	3.84	77.7	23.5	1.9	25.3	76.1
J19XD3	6	110.0	112.0	4.42	71.0	21.3	1.2	20.3	60.9
J19XD4	8	109.5	111.5	3.99	16.2	5.2	0.4	5.8	17.4
J19XD5	10	109.0	111.0	4.51	72.0	21.8	1.2	21.7	65.0
J19XD6	12	108.0	110.0	4.57	58.4	18.1	1.2	17.6	52.9
J19XD7	14	107.5	109.5	4.07	32.6	10.7	0.6	9.8	29.5
J19XD8	16	107.0	109.0	4.08	30.2	9.1	0.6	8.5	25.5
J19XD9	18	106.0	108.0	3.91	18.2	6.1	0.6	6.2	18.6
J19FX0	20	105.5	107.5	4.12	16.7	5.3	0.3	5.5	16.4
J19FX1	22	105.0	107.0	3.99	22.4	6.9	0.4	7.4	22.2
J19FX2	24	104.0	106.0	4.00	31.6	9.8	0.3	8.7	25.9
J19FX3	26	103.5	105.5	4.04	76.5	22.1	1.7	20.7	62.3
J19FX4	27	103.0	105.0	3.97	73.7	22.2	1.9	22.0	66.3

Abbreviations: “ft-bgs” = feet below ground surface; “m-NAVD88” = meters, North America Vertical Datum of 1988

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Environmental Calculation Cover Page

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1. Purpose

Beginning in 1987, elevated concentrations of tetrachloroethene (PCE) and its biodegradation products, trichloroethene (TCE) and *cis* 1,2-dichloroethene (cDCE) have been observed in well 399-1-16B. The source for these concentrations is unclear. It has been posited that spills occurring in the 300 Area Process Trenches near well 399-1-23 may be a potential source of the concentrations in well 399-1-16B.

The purpose of the analysis presented here is two-fold. The first goal is to assess whether it is plausible that PCE-DNAPL which was spilled in the 300 Area Process Trenches would infiltrate through the Hanford Formation and penetrate into the Ringold Formation. The second objective is to assess the plausibility of PCE-DNAPL trapped in the Ringold Formation beneath the 300 Area Process Trenches could be the source of PCE, TCE, and cDCE concentrations observed in well 399-1-16B. The potential source location was assumed to be well 399-1-23.

2. Methodology

Feasibility of DNAPL Penetration into Ringold Formation

The primary parameter governing whether a pool of DNAPL is capable of entering an adjacent portion of uncontaminated soil is the entry pressure of that soil. For a DNAPL pool overlying a stratum of finer-grained sediments, the pool thickness (T) necessary to overcome the entry pressure of the underlying sediments can was presented by Pankow and Cherry (1996, p. 102):

$$\Delta\rho\ g\ T = P_d \quad \rightarrow \quad T = \frac{P_d}{\Delta\rho\ g} \tag{1}$$

where P_d is the entry (displacement) pressure of the underlying sediment, Δρ is the difference in densities between the DNAPL and water, and g is gravitational acceleration.

Pankow and Cherry (1996, p. 102) also present a correlation between entry pressure and hydraulic conductivity:

$$P_d = 9.6 \left(\frac{\sigma}{\sigma_{aw}}\right)\left(\frac{K}{\Phi}\right)^{-0.403} \tag{2}$$

where K is the hydraulic conductivity (cm/s), Φ is the porosity, σ is the interfacial tension of the fluid pair of interest, and σ_{aw} is the interfacial tension of water against air.

Combining these two equations, Pankow and Cherry (1996, p. 102) presented a simple equation for calculating the DNAPL pool thickness that can be sustained by an underlying, lower-permeability soil:

$$T = 9.6\left(\frac{\rho_w}{\Delta\rho}\right)\left(\frac{\sigma}{\sigma_{aw}}\right)\left(\frac{K}{\Phi}\right)^{-0.403} \quad (3)$$

where T is the DNAPL pool thickness (cm) and K is the hydraulic conductivity (cm/s). An infiltrating non-wetting phase will tend to invade an uncontaminated soil through the largest pore throats of that soil. Accordingly, it will be the portions of the Ringold Formation beneath the PCE spill location that have the highest hydraulic conductivity (and largest pore throats) which will be invaded most easily by the PCE-DNAPL. Aquifer tests tend to represent a volume of soil at a considerably larger scale (meters) than is applicable to DNAPL invasion into uncontaminated sediments (centimeters). The reported hydraulic conductivity likely represents an average value of both higher and lower values present in the volume of soil included in the aquifer test. It should also be noted that the scales at which anisotropy is evident in hydraulic conductivity values (meters) are considerably larger than the scale applicable to entry pressure (centimeters). For these reasons, it is important to focus on the highest reported values of hydraulic conductivity of the Ringold Formation.

Plume Simulations

The PCE-DNAPL entrapped in the Ringold will act as a source zone for dissolved PCE in groundwater. This will result in a downstream plume of PCE and, in the presence of reductive dechlorination, its daughter products TCE, cDCE, and VC.

To simulate the transport of dissolved PCE and its daughter products, the analytical simulator REMChlor (Falta et al., 2007a) was employed. REMChlor takes information about the source zone, groundwater velocity, and transport processes and simulates the downstream concentrations of the solutes of interest. Because many aspects of the PCE source zone and transport processes are uncertain, sensitivity simulations were conducted to evaluate results under a variety of conditions.

3. Assumptions and Inputs

Feasibility of DNAPL Penetration into Ringold Formation

The pertinent parameters for calculating the PCE pool thickness required to penetrate the Ringold Formation are summarized in Table 1.

Table 1. Parameters for Pool Thickness Calculation

Parameter	Value	Units	Reference	Comment
Porosity, ϕ	0.25	--	Williams et al., 2008, p. 3.25	model input
	0.267	--	Last et al., 2009, p. 14	sitewide average
Hydraulic Conductivity, K	40	m/d	Williams et al., 2008, p. 3.26	model input, K_{xy}
	4	m/d	Williams et al., 2008, p. 3.26	model input, K_z
	4.13e-4	cm/s	Last et al., 2009, p. 18	sitewide average
Water Density, ρ_w	998.2	kg/m^3	Potter and Wiggert, 1991, p. 655	20 ^oC
PCE Density, ρ_n	1.63	g/cm^3	Pankow and Cherry, 1996, p. 508	25 ^oC, note: 1 g/cm^3 = 1e3 kg/m^3
Water Surface Tension, σ_{aw}	0.0736	N/m	Potter and Wiggert, 1991, p. 655	20 ^oC, note: 1 N/m = 1e3 dyn/cm
PCE-Water Interfacial Tension, σ_{nw}	47.5	erg/cm^2	Horvath, 1982, p. 153	20 ^oC, note: 1 erg/cm^2 = 1 dyn/cm

Using Equation 3 and the parameters from Table 1, a range in DNAPL pool thicknesses from 19 cm to 133 cm is estimated. The value of 19 cm was calculated using the highest hydraulic conductivity and lowest porosity in Table 1 and the value of 133 cm was calculated using the lowest hydraulic conductivity and highest porosity in Table 1. For the reasons discussed above, the lower end of the range for estimated pool height can be expected to be most realistic.

As PCE-DNAPL infiltrates through the Hanford Formation, some of the PCE will be trapped by capillary forces and remain behind as a residual saturation. Assuming a three-phase residual PCE saturation of 5% for the 10 m of vadose zone (Peterson et al., 2008, p. 2.5) and 20% for the 6.5 m of saturated zone (Peterson et al., 2008, p.2.5) above the Ringold Formation beneath the 300 Area Process Trenches and an assumed PCE infiltration column diameter of 10 cm, 3.5 L of PCE can be expected to remain as residual saturation. For a 120 gallon (454 L) spill of PCE (Peterson et al., 2008, p. 3.1), that would leave 451 L of PCE available to pool at the Hanford-Ringold Formation contact. A 451 L pool with a pool height of 19 cm would result in a pool diameter of 345 cm. This would involve a diameter to height ratio of 18 for the pool. It appears very plausible that such a pool could form in the Hanford formation and therefore it is plausible that PCE infiltrating beneath the 300 Area Process Trenches would penetrate the Ringold Formation.

Plume Simulations

Explanation of the REMChlor input parameters can be found in the REMChlor User's Manual (Falta et al., 2007b). Additional description of the methods or rationale used to determine the values for the input parameters is included in the accompanying spreadsheet "PCE calculations_rev1.xlsx."

Because no measurements of the initial source concentration exist, two scenarios were considered for input into REMChlor. First, it was assumed that the source concentration was equal to the equilibrium solubility of PCE in water. This represents the maximum concentration possible and corresponds to PCE covering the entire source width and depth and a source residence time sufficient that the groundwater

would reach equilibrium with the PCE. Lower concentrations are also possible and can be considered depending on the results from the simulations.

The source mass of PCE is simply assumed to correspond to the entire volume of PCE spilled. The PCE mass is primarily important in dictating the persistence of the source zone over time and is of arbitrary importance to this study so long as the source geometry, source function and source concentration do not result in depletion of the source during the time period of interest.

The source function exponent (gamma) in REMChlor describes the dissolved concentration emitting from the source zone as a function of the depletion of source mass. While this is a very important parameter in dictating the long-term fate of a DNAPL source, it does not play such an important role in the qualitative evaluation of whether a particular source could plausibly produce concentrations in a downstream observation well. A typical gamma value of 1.0 (Falta et al., 2007b) was used. An exponent of 1.0 results in a source concentration that declines exponentially with time. If necessary, other possible source function exponents of 0.0, 1.0 or 2.0 can be investigated. The exponent of 0.0 means that the source concentration will always remain at C_0 until the mass is depleted, at which point the concentration will go to zero. An exponent of 0.5 leads to a source concentration that declines linearly with time. This is indicative of a source zone in which the DNAPL mass is distributed primarily in the higher permeability regions as would be expected for a non-wetting DNAPL. An exponent of 2.0 is indicative of a source zone in which the DNAPL mass is distributed primarily in the lower permeability regions.

The source width and depth are primarily important in dictating the persistence of the DNAPL source zone. For example, a larger width and depth would result in a shorter duration for the DNAPL source mass to deplete. The source is assumed to have a width of 10 meters and a depth of 3 meters.

The Darcy velocity was determined by estimating the distance between the 105.9 m and 105.8 m contours in the vicinity of well 399-1-23 from the June 2009 Ringold water levels found in Environmental Calculation ECF-300FF5-11-0151. The 40 m/d value for hydraulic conductivity reported by Williams et al. (2008, p. 3.26) was then used along with Darcy's law to calculate the Darcy velocity. The porosity value of 0.25 reported in Williams et al. (2008, p. 3.25) is used by REMChlor to calculate the pore velocity.

Source zone remediation parameters were set to zero to reflect that no remediation has been done on the source. Retardation factors primarily impact the timing of the downstream concentrations and have little impact on their magnitude. A retardation factor of 1, corresponding to no retardation, was used.

Two values for the velocity field coefficient of variation (Sigmav) were chosen to correspond to scale dependent longitudinal dispersivities of x/100 and x/10, where x is the longitudinal distance from the source to the solute front. A longitudinal distance of 170 m was estimated along the groundwater flow direction from the source zone to the plane transecting well 399-1-16B. This length was then used to estimate constant x-direction dispersivity coefficients corresponding to the two values chosen for the Sigmav parameter. The y-direction dispersivity coefficient was initially assumed to be $1/10^{th}$ the x-direction value. No dispersion was considered in the z-direction in keeping with a two-dimensional x-y solute plume.

The value for the minimum normalized streamtube velocity (vMin) of 0 suggested in the REMChlor User's Manual was used. Similarly, the suggested method of calculating the maximum normalized streamtube velocity vMax = 1 + 4*Sigmav was used. Because the analytical solution can be solved relatively quickly by modern computers, a large number of stream tubes was selected to focus on a smooth solution over run speed.

The mass of TCE created by first order decay of one unit of mass of PCE was calculated as the molecular weight of TCE divided by the molecular weight of PCE. This yield is typical for reductive dechlorination (Falta et al., 2007b). Similarly, the mass of cDCE created by first order decay of one unit of mass of TCE was calculated as the molecular weight of cDCE divided by the molecular weight of TCE. Because no VC was observed in any of the groundwater samples, a yield coefficient of 0 was assumed for the transformation from cDCE to VC.

While REMChlor allows up to 9 different reaction rates for each chemical species, a single reaction rate for each component based on the mean reaction rates reported in Aziz et al. (2002, p. 3) was assumed. The reaction rate for cDCE was assumed to be zero since no VC was observed in groundwater samples.

Spatial discretization values were chosen so that output would be produced at the location of wells 399-1-16B and 399-1-8. Output were taken from the model grid cell with an x-value of 168.1 m and a y-value of 135 m for well 399-1-16B and with an x-value of 188.1 m and a y-value of 27 m for well 399-1-8. Time discretization was chosen such that yearly simulation output was produced.

The input parameters used in the base case REMChlor simulations are summarized in Table 2.

Table 2. Summary of REMChlor Model Inputs

Parameter	Value(s)	Units	Comments
Concentration	0.15	g/L	Equilibrium solubility for PCE
Mass	740	kg	Entirety of PCE spilled, calculated as mass = volume * density
Gamma	1	--	Exponentially decaying source function[(a)]
Source Width	10	m	Assumed
Source Depth	3	m	Assumed
Darcy Velocity	10	m/yr	Calculated from q = -K dh/dl = 40m/d*365.25d/yr*0.1m/140m[(b)]
Porosity	0.25	--	Williams et al., 2008, p. 3.25
Percent Removed	0	%	Not used as remediation was not pertinent to this study
Start Time	0	yr	
End Time	0	yr	
Source Decay	0	1/yr	
Retardation Factor	1	--	Assume no retardation
Sigmav	0.14	--	Corresponds to dispersivity of alphax = x/100[(c)]
vMin	0	--	Typical value from p. 41 of User's Manual
vMax	1.6	--	vMax = 1 + 4*Sigmav as recommended on p. 41 of User's Manual
# Stream Tubes	100	no.	Large number to achieve smooth solution
alphay	0.17	m	alphax/10 or alphax[(d)]
alphaz	0	m	Assume two-dimensional x-y plume so no dispersion in z
Yield 2 from 1	0.79	--	Calculated as MW_{TCE}/MW_{PCE}
Yield 3 from 2	0.74	--	Calculated as MW_{cDCE}/MW_{TCE}
Yield 4 from 3	0	--	Assumed to be zero since no VC observed

Time Period 1	30	yr	Time since PCE spill
Time Period 2	50	yr	One period so irrelevant but larger than Time Period 1
X1	400	m	Encompassing the x-dimension of the region of interest
X2	700	m	One zone so irrelevant but larger than X1
PCE decay rate	1.4	1/yr	Mean values from Table 2. of Aziz et al. (2002), p. 3
TCE decay rate	1.5	1/yr	
cDCE decay rate	0	1/yr	No observed VC so assume no cDCE decay or VC
VC decay rate	0	1/yr	
X (Int, Min, Max)	101, 0.1, 200.1	m	Discretization to have output at well 399-1-16B location
Y (Int, Min, Max)	33, -144, 144	m	Discretization to have output at well 399-1-16B location
Z (Int, Min, Max)	1, 0, 0	m	Assume two-dimensional x-y plume
t (Int, Min, Max)	30, 0, 30	yr	Yearly output for 30 years

(a) See p. 39 of the User's Manual

(b) K = 40 m/d (Williams et al., 2008, p. 3.26), dl = 140 m from Ringold contours in Environmental Calculation ECF-300FF5-11-0151), and dh = -0.1 m (contour interval in Environmental Calculation ECF-300FF5-11-0151)

(c) From lookup table on page 41 in the User's Manual

(d) Assumed α_x equal to distance from source (399-1-23) to observation pt (399-1-16B) along flow direction of 167.56 m divided by 100

4. Software Applications

The plume simulations were performed using the approved utility calculation software REMChlor (Remediation Evaluation Model for Chlorinated Solvents) Version 1.0 code, Hanford Information System Inventory (HISI) identification number 2948. The REMChlor code provides an analytical solution for simulating the transient effects of ground water source and plume remediation on the transport of chlorinated solvents with biotransformation between solvents (PCE → TCE → DCE → VC). The contaminant source model is based on a power-function relationship between source mass and source discharge, and serves as a time dependent, mass-flux boundary condition to the analytical plume model, where flow is assumed to be one dimensional. The plume model simulates first-order sequential decay and production of several species, and the decay rates and parent/daughter yield coefficients are variable functions of time and distance.

The REMChlor code has been graded as Level D software in accordance with PRC-PRO-IRM-309, *Controlled Software Management*. REMChlor is not designated as a Safety System Software. This application of REMChlor within the 300 Area is limited to exploratory work to validate or invalidate a hypothesis regarding potential source location for chlorinated solvents. The use of this software was consistent with its purpose, used within its limitations, and was a valid application of REMChlor consistent with the functional requirements identified in CHPRC-01455 Rev 0, *REMChlor Software Management Plan*.

The REMChlor code was executed for this calculation on a Dell® Optiplex® 780 with a 2.83-GHz Intel® Core Quad CPU Q9550 processor and 8 GB of RAM loaded with the 64-Bit Windows 7 Professional Service Pack 1 operating system.

Microsoft Excel 2007® spreadsheets were used to calculate the feasible DNAPL pool height and DNAPL pool diameter and relevant inputs for REMChlor. This use of Excel® is in the spreadsheet category and all calculations are subject to checking as part of this Environmental Calculation File.

5. Calculations

Feasibility of DNAPL Penetration into Ringold Formation

Calculations for the DNAPL penetration analysis are attached in the spreadsheet "PCE calculations_rev1.xlsx". Calculations of a sustainable pool height are in the "Pool Height" worksheet. Calculations of an estimated pool diameter are in the "Pool Diameter" worksheet. Descriptions of the methodology and equations used are included in the worksheets.

Plume Simulations

Calculation of the interwell distances from the presumed source well 399-1-23 to the observation wells 399-1-16B and 399-1-8 are detailed in the "Interwell Info" worksheet within the "PCE calculations_rev1.xlsx" spreadsheet. Derivation of the REMChlor model input parameters listed in Table 2 is included in the "REMChlor Inputs" worksheet within the "PCE calculations_rev1.xlsx" spreadsheet.

6. Results/Conclusions

Feasibility of DNAPL Penetration into Ringold Formation

Pool height and pool diameter calculations indicate that it is plausible that PCE infiltrating beneath the 300 Area Process Trenches would penetrate the Ringold Formation.

Plume Simulations

The locations of wells within the 300 Area are shown in Figure 1. The water level elevation contours, indicating the flow direction during June and December of 2009, are depicted in Figure 2. The results for the simulation using the base case parameters are shown in Figures 3 through 7. Figures 3 through 5 depict the PCE, TCE, and cDCE plumes, respectively, after a period of 28 years. This duration corresponds roughly to the time between the latest groundwater observations and the spill date of November 1982 (Peterson et al., 2008, p. 3.1). Figures 6 and 7 depict the simulated and observed concentrations at well 399-1-16B and well 399-1-8, respectively. The observed data for wells 399-1-16B and 399-1-8 were downloaded from the HE15 database on August 31, 2010. Note that simulated concentrations are zero at well 399-1-16B. These figures indicate that the base case parameters – particularly a longitudinal dispersion coefficient corresponding to x/100 (where x is the distance to the transport front) and a transverse dispersion coefficient $1/10^{th}$ the longitudinal dispersion – produce a plume that is too narrow to result in VOC concentrations reaching well 399-1-16B. Note that simulated

concentrations can be seen in well 399-1-8 (Figure 7) but are somewhat higher than the observed concentrations.

To test the sensitivity of the dispersion coefficients, additional sensitivity simulations were conducted. These sensitivity simulations are summarized in Table 3 along with the base case simulation. For simulation case R1, the Sigmav parameter was increased from 0.14 to 0.45, corresponding in an increase in the longitudinal dispersion coefficient from x/100 to x/10, where x is the distance to the transport front. The alphay parameter was also increased accordingly but still corresponds to a ratio of 1/10 between the transverse and longitudinal dispersion coefficients. The simulation results for case R1 are given in Figures 8 through 12. The increased dispersion results in the plume reaching well 399-1-16B but at extremely low concentrations (Figure 11). The simulated concentrations at well 399-1-8 are higher than those observed (Figure 12).

Simulation case R2 involves increasing the transverse dispersivity to be one-half of the longitudinal dispersivity. The simulation results are shown in Figures 13 through 17. This increased transverse dispersivity results in concentrations of the same order of magnitude as those observed at well 399-1-16B (Figure 16). The simulated concentrations are considerably higher than those observed at well 399-1-8, however (Figure 17).

Table 3. Description of Sensitivity Runs

Case	Comments	Plausibility
R0	Base case parameters from Table 2. Corresponds to alphax = x/100 and alphay = alphax/10.	Plume is too narrow to reach the lateral extents of well 399-1-16B. Concentrations zero at well 399-1-16B and somewhat high at well 399-1-8.
R1	Sigmav = 0.45, vMax = 2.8, alphay = 1.7. Corresponds to alphax = x/10 and alphay = alphax/10.	Plume crosses through well 399-1-16B. Concentrations far lower than those observed at well 399-1-16B and high at well 399-1-8.
R2	alphay = 8.5. Corresponds to alphay = alphax/2. Sigmav = 0.45, vmax = 2.8	Plume crosses through well 399-1-16B. Concentrations plausible at well 399-1-16B but much too high at well 399-1-8.

Given the number of uncertainties regarding the DNAPL source zone location and geometry and the transport parameters of the Ringold Formation, a wide array of possible concentration outcomes can be simulated. It is certainly possible to simulate concentrations consistent with those observed at well 399-1-16B using what can be considered reasonable parameters and assumptions. There is no combination of parameters, however, that can simultaneously simulate the observed concentrations at both well 399-1-16B and well 399-1-8 using the described derivation of the groundwater flow direction of 40° south of east. Because well 399-1-8 is closer to the centerline of the groundwater flow direction than well 399-1-16B, it will always have higher simulated concentrations than well 399-1-16B for any REMChlor parameter combinations. The only way for the simulated concentrations in well 399-1-8 to be lower than those in well 399-1-16B, as is the case with the observed concentrations, would be for well 399-1-16B to be closer to the centerline of the groundwater flow direction. This would require a groundwater flow direction almost due east, which is inconsistent with the water level measurements in

the Ringold Formation. These findings indicate that it does not appear plausible that the source for the concentrations observed in well 399-1-16B is the 300 Area Process Trenches.

The model presented here is of a simplistic, scoping nature. The model assumes homogeneity with a one dimensional flow field. Furthermore, many of the model parameters are assumed and poorly constrained. None of the limitations of the model, however, change the basic conclusion that it does not appear plausible that concentrations at well 399-1-16B and well 399-1-8 can result from a source at the 300 Area Process Trenches given the current understanding of the groundwater flow direction.

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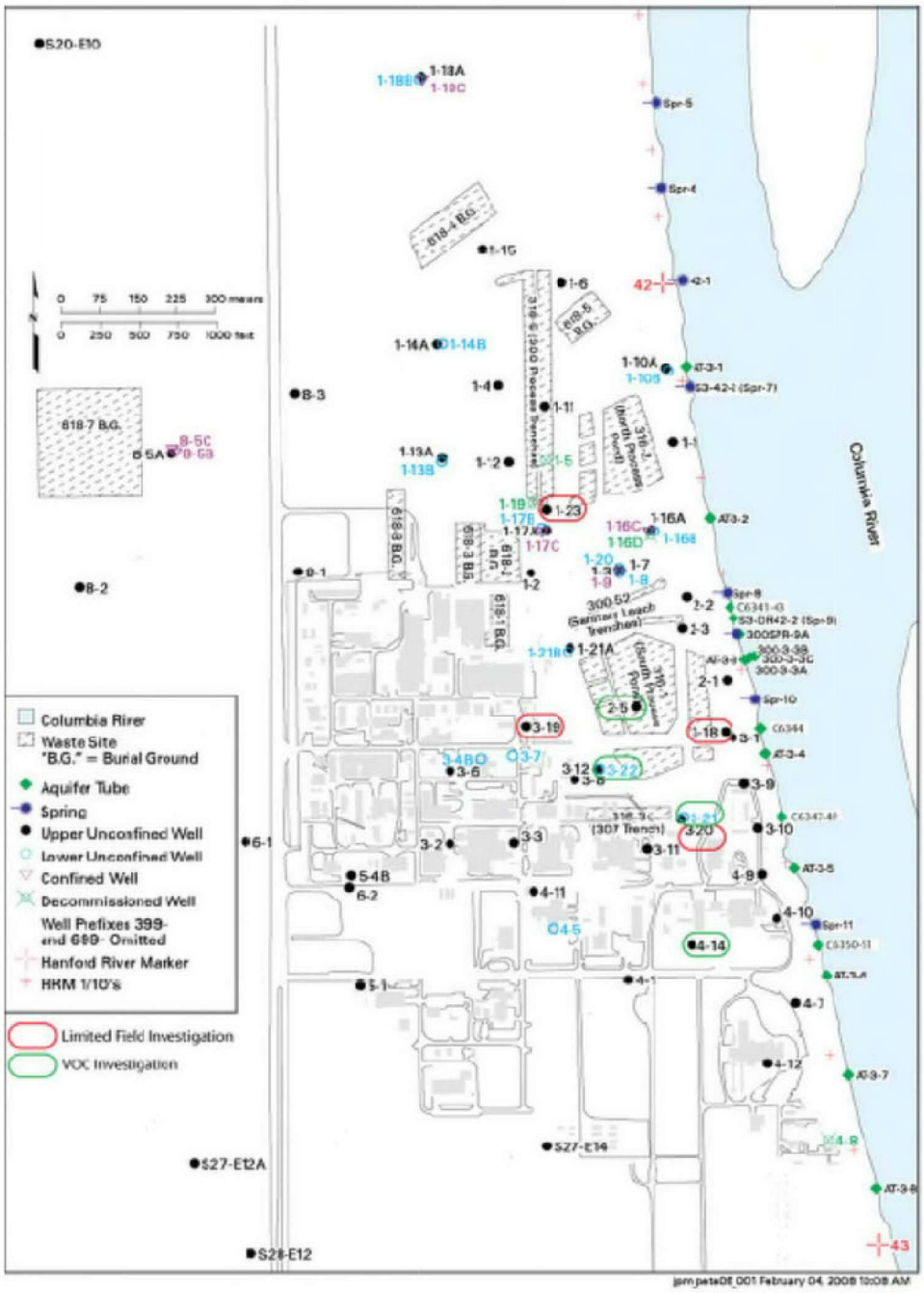


Figure 1. Well location map. [Copied directly from Figure 1.2 of Peterson et al., 2008, p.1.3].

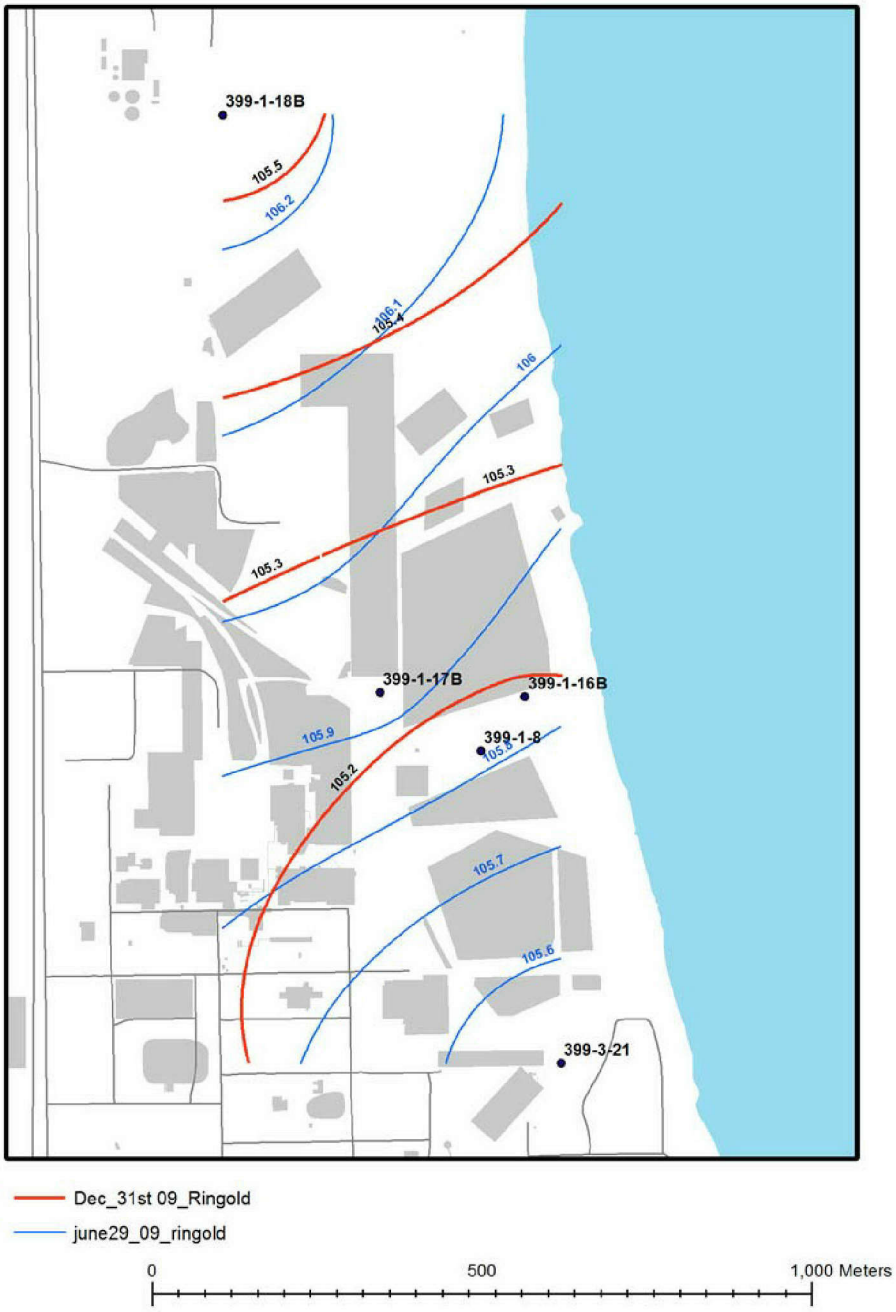


Figure 2. Ringold Formation water-level elevations during June and December 2009.

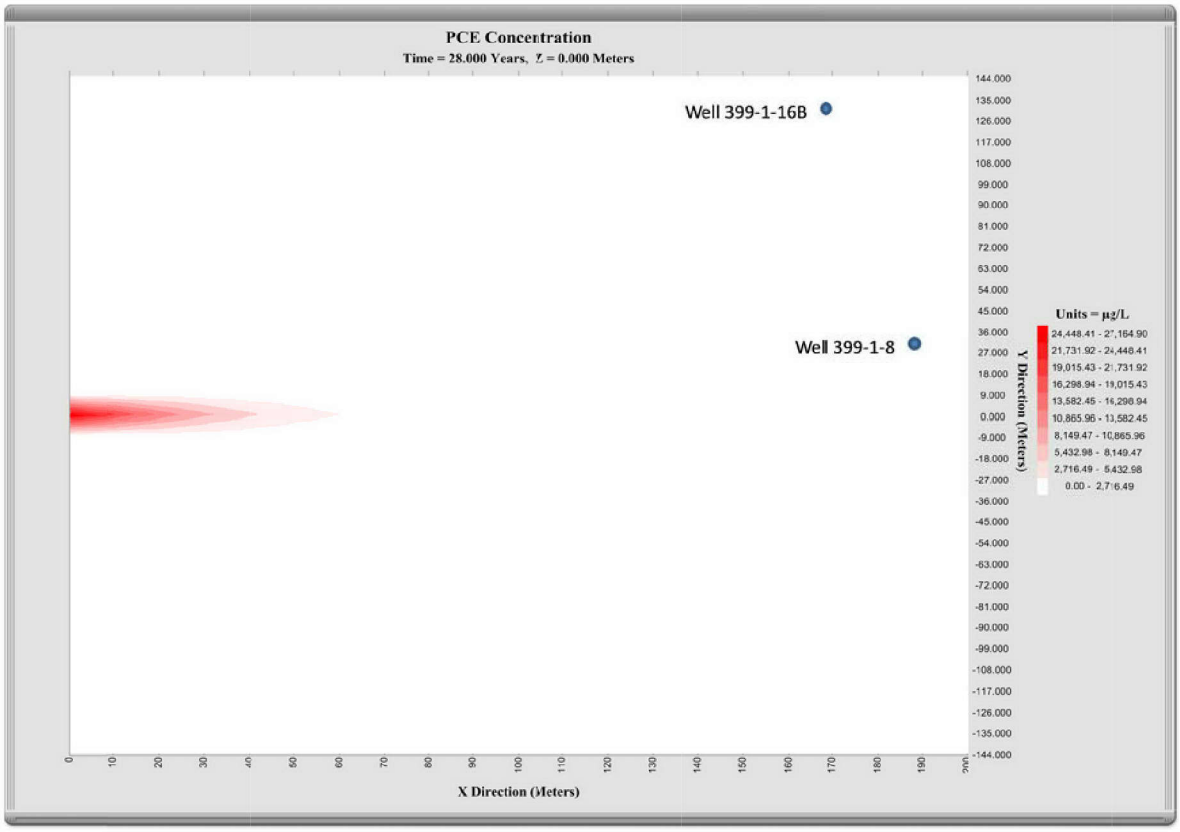


Figure 3. Case R0: simulated PCE concentrations after 28 years.

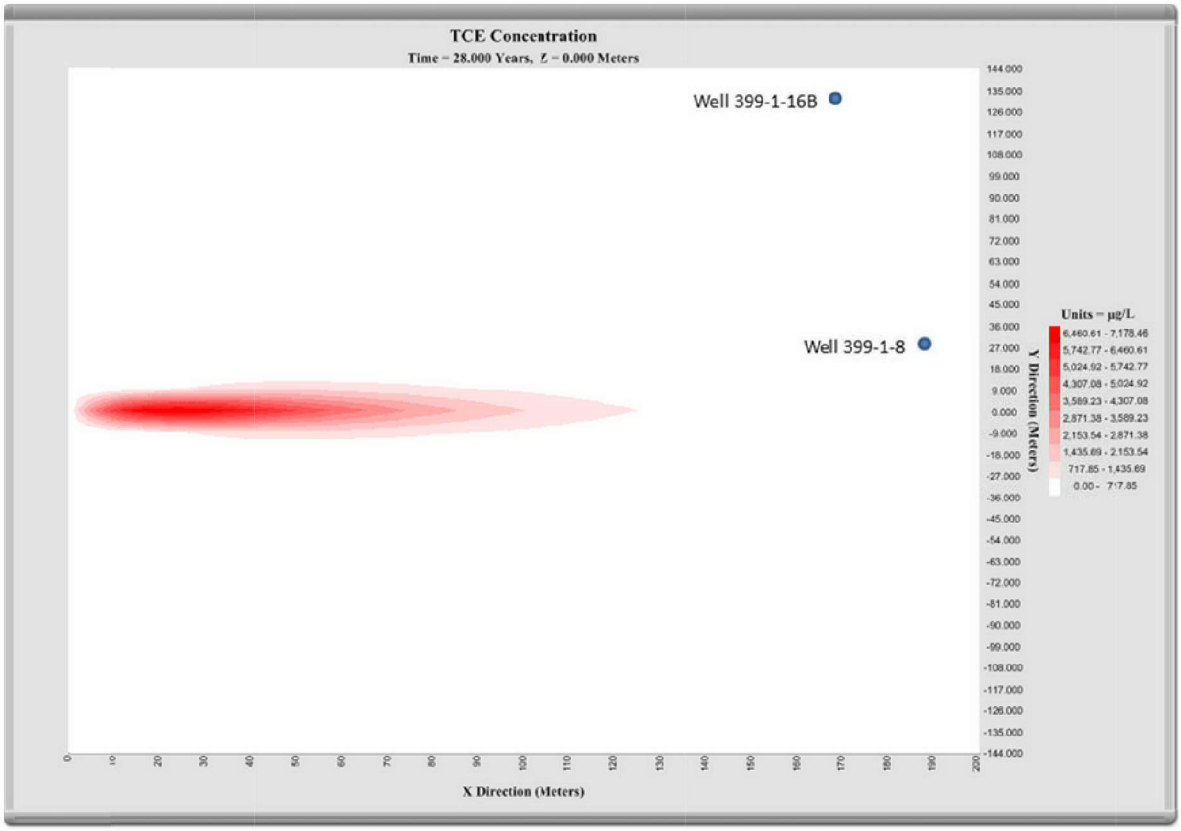


Figure 4. Case R0: simulated TCE concentrations after 28 years.

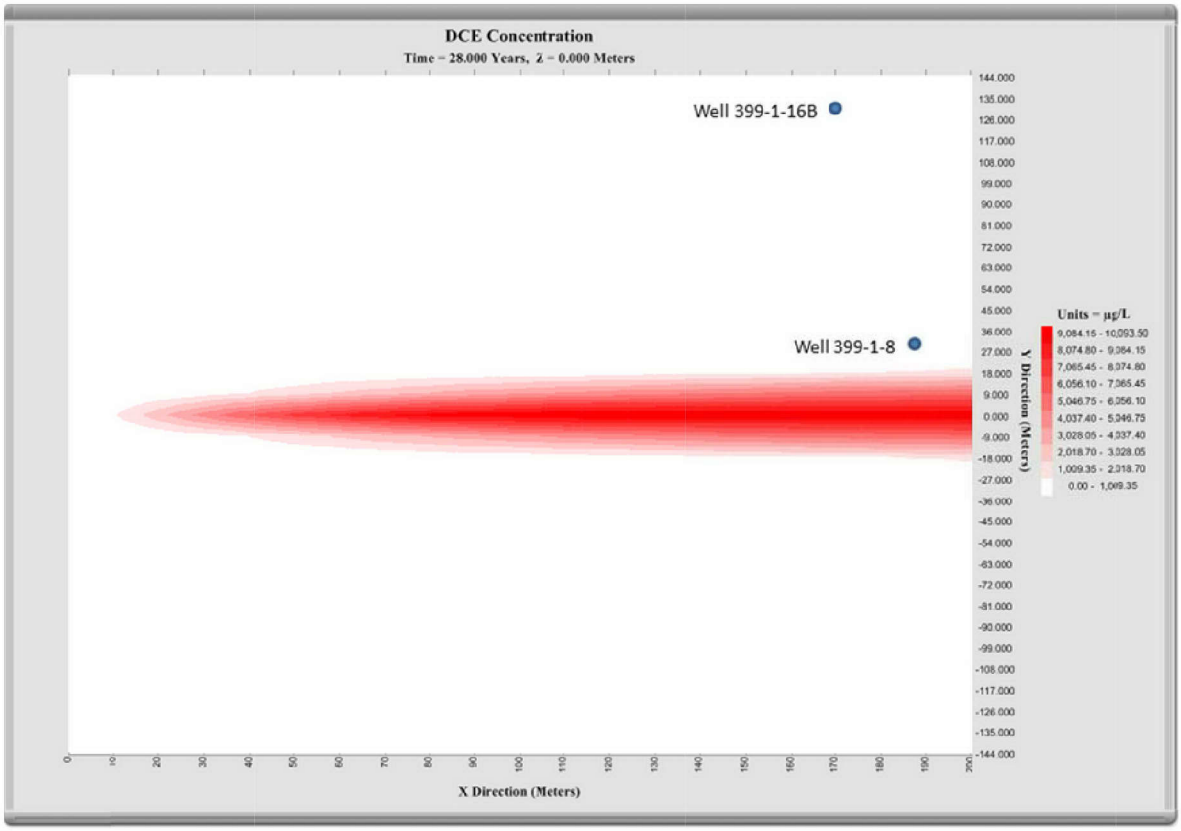


Figure 5. Case R0: simulated cDCE concentrations after 28 years.

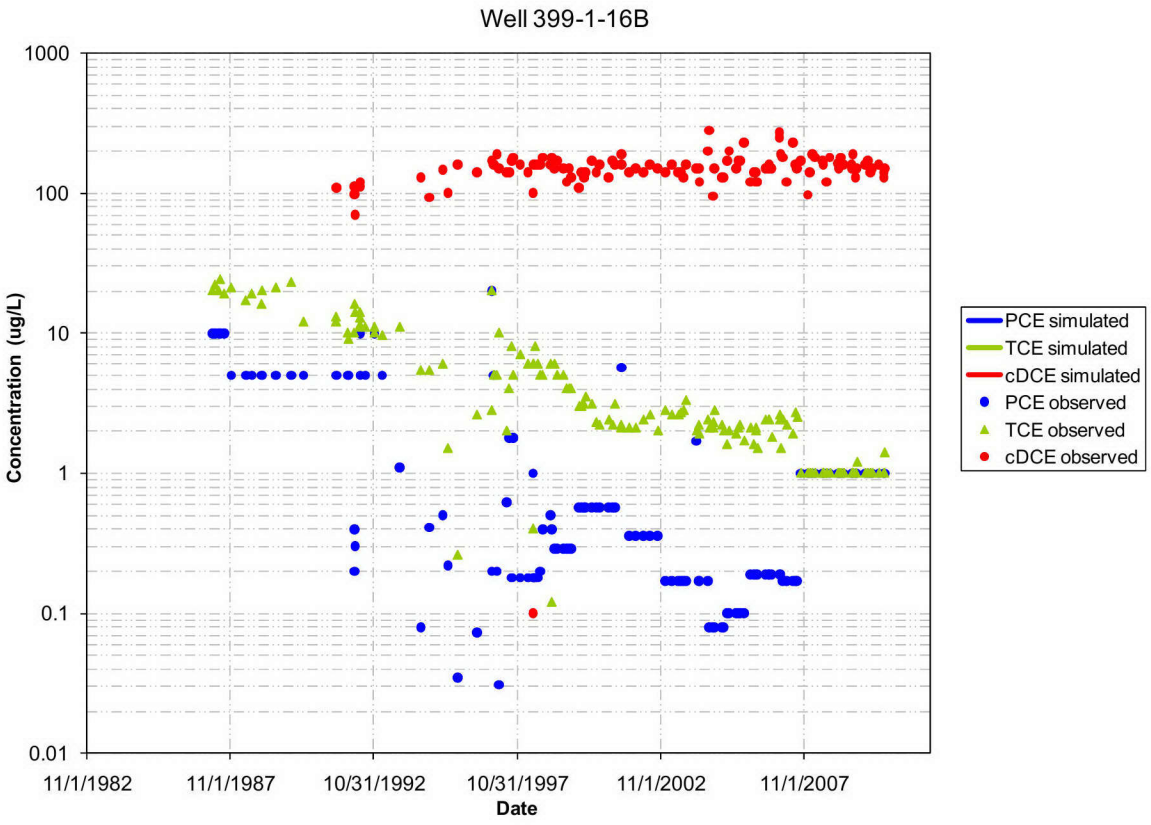


Figure 6. Case R0: simulated and observed concentrations in Well 399-1-16B.

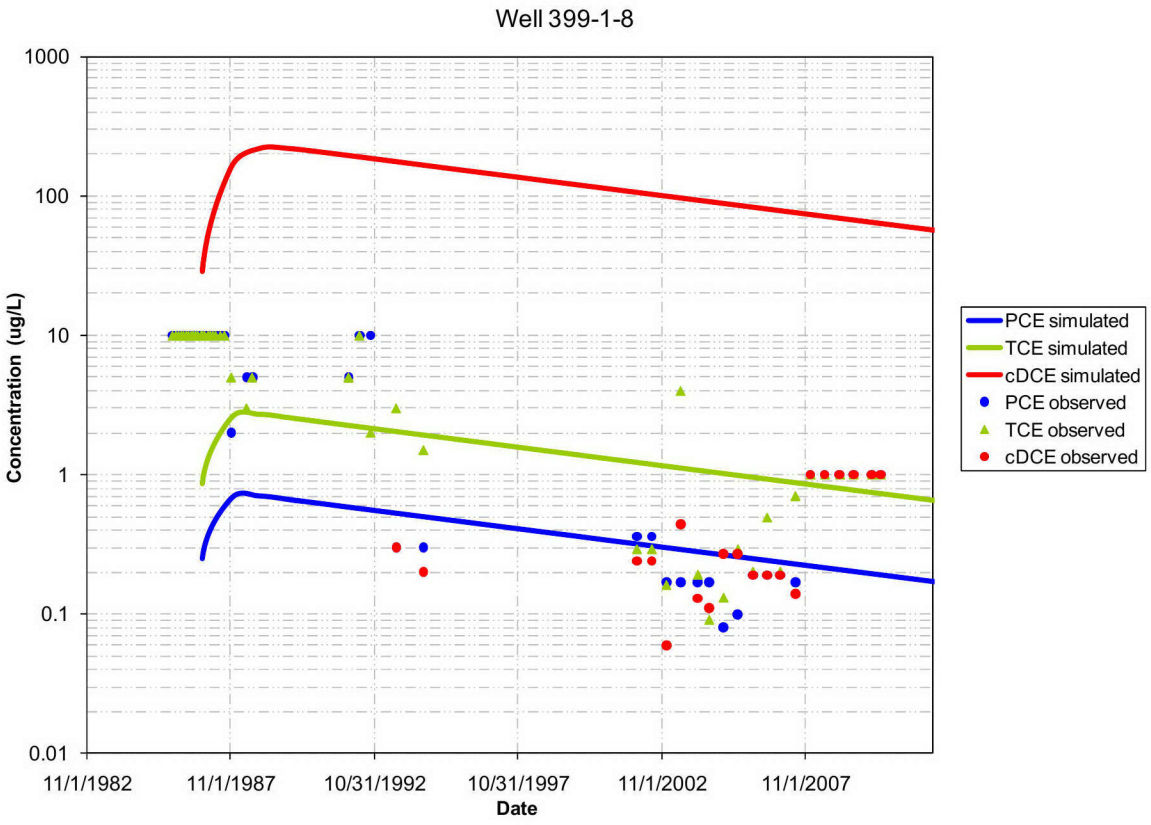


Figure 7. Case R0: simulated and observed concentrations in Well 399-1-8.

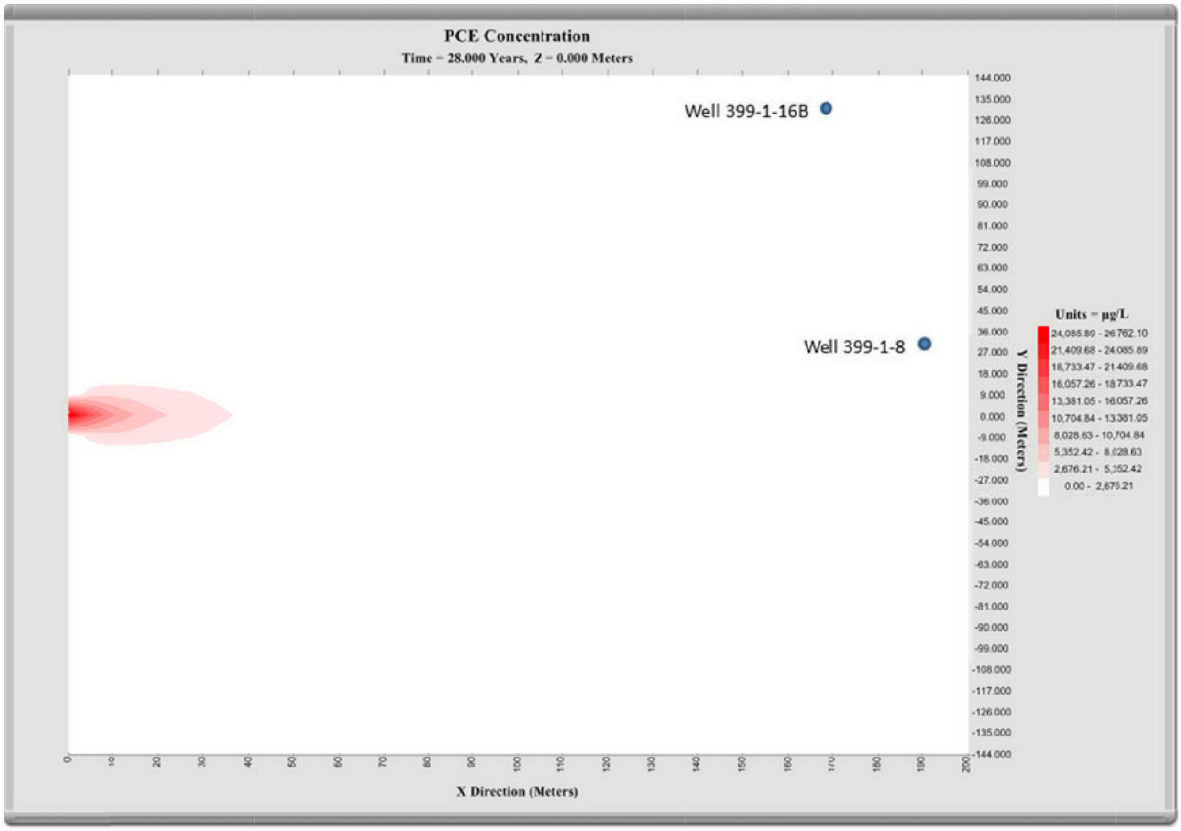


Figure 8. Case R1: simulated PCE concentrations after 28 years.

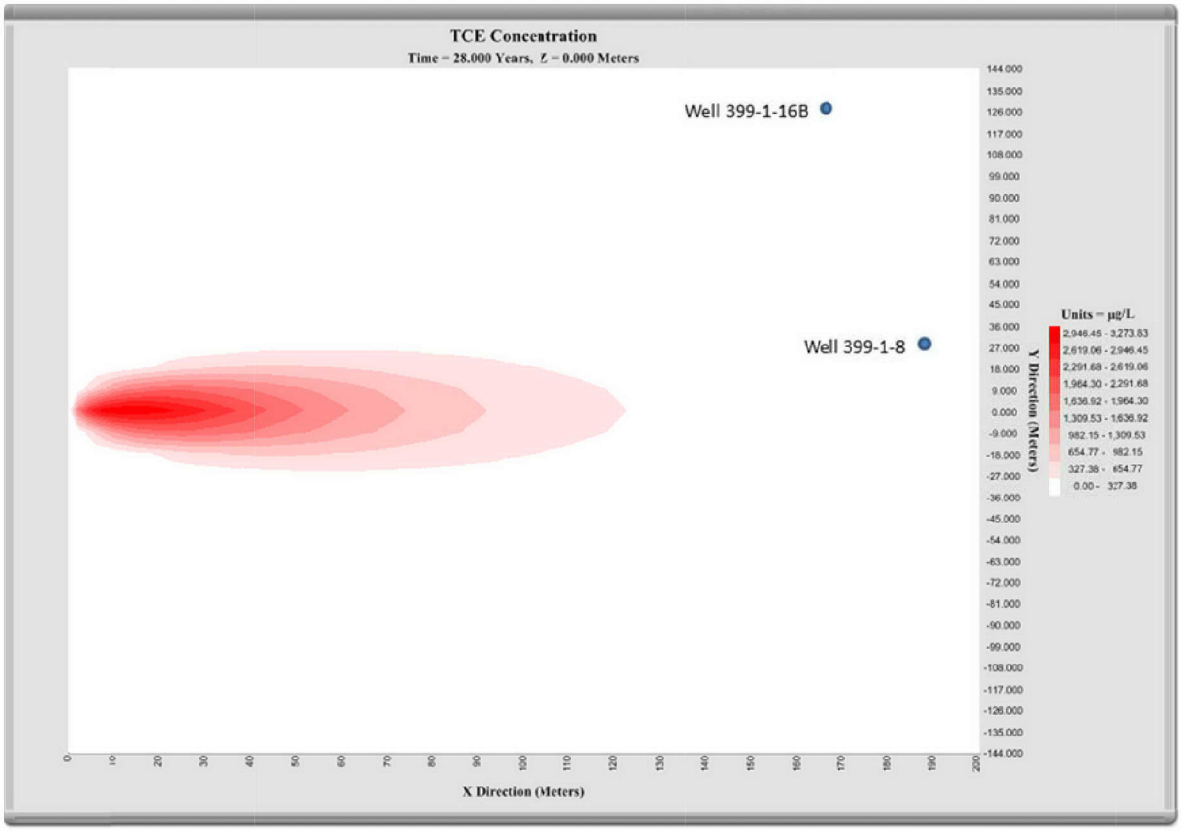


Figure 9. Case R1: simulated TCE concentrations after 28 years.

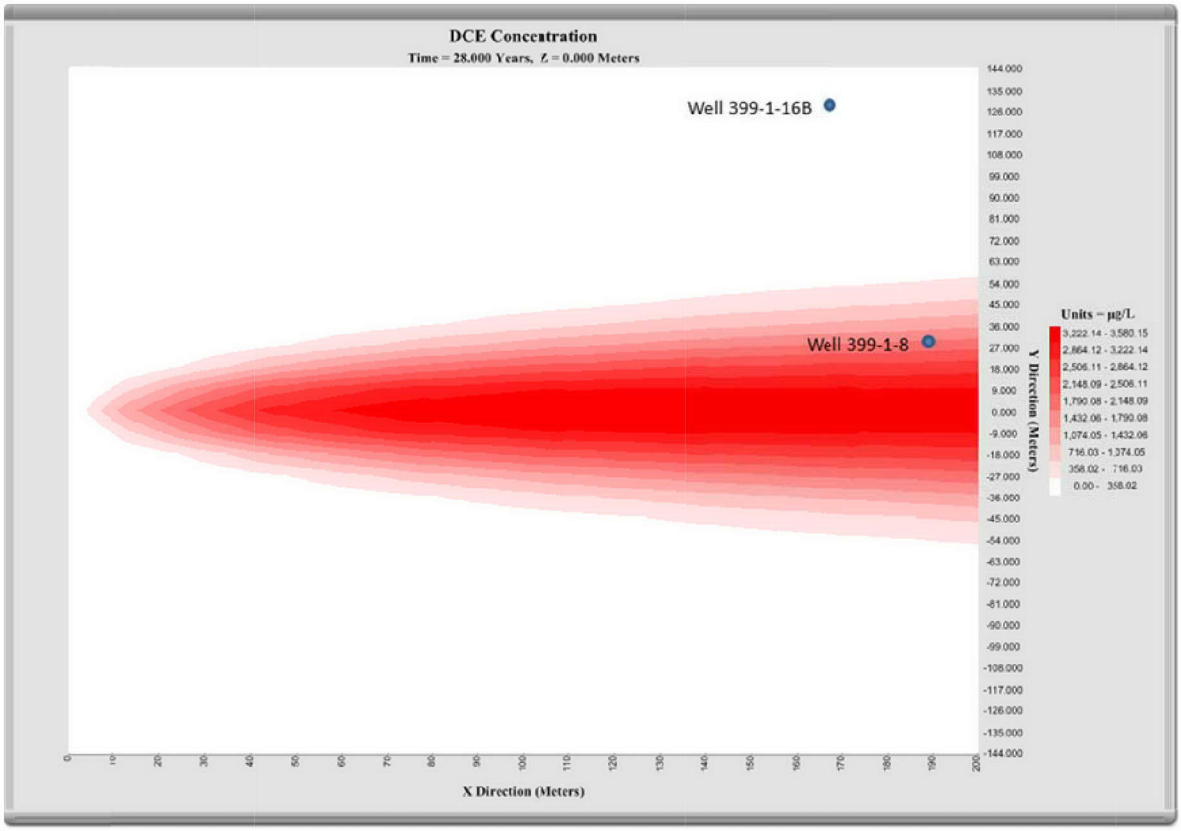


Figure 10. Case R1: simulated TCE concentrations after 28 years.

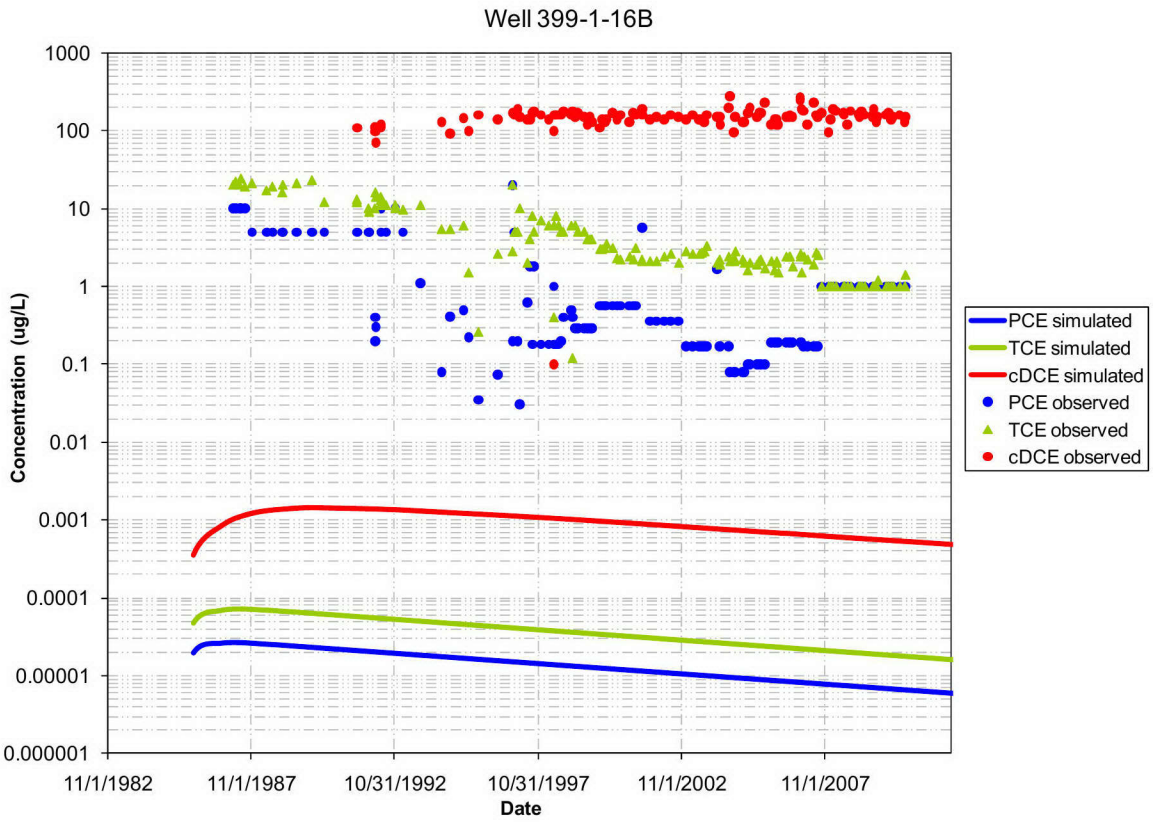


Figure 11. Case R1: simulated and observed concentrations in Well 399-1-16B.

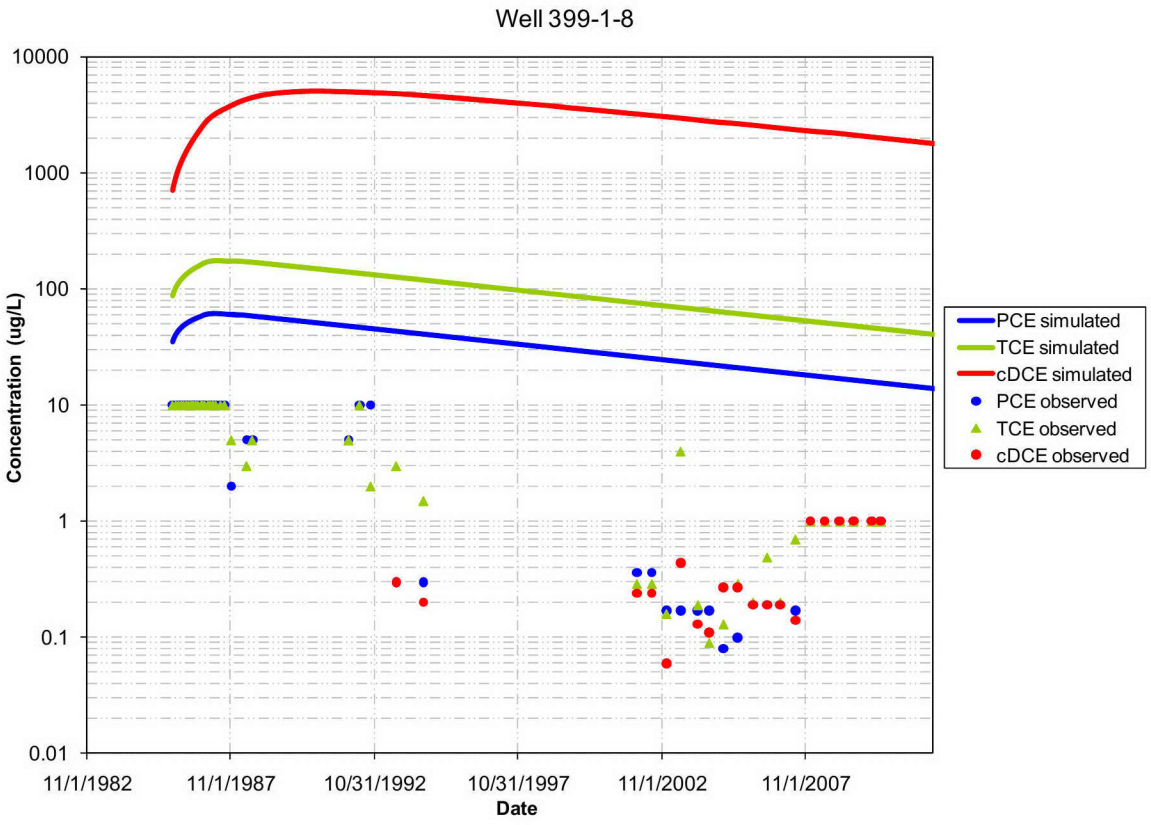


Figure 12. Case R1: simulated and observed concentrations in Well 399-1-8.

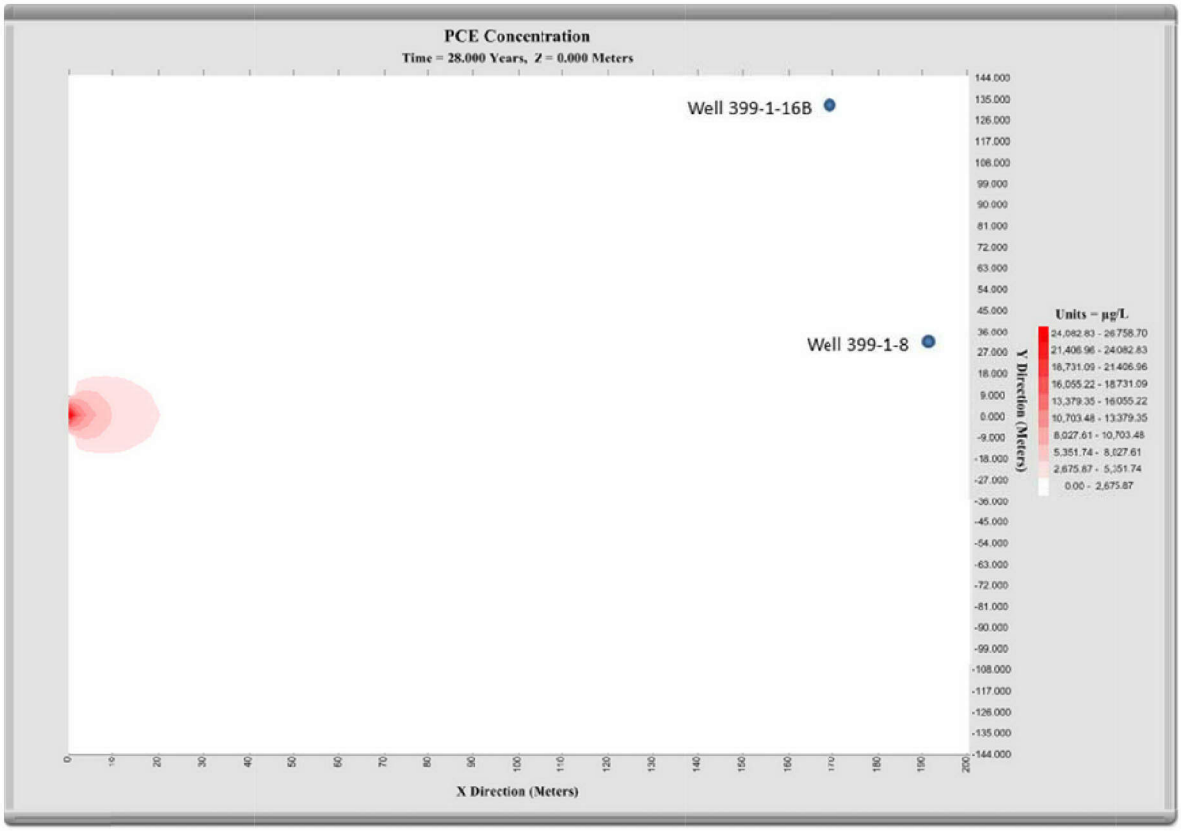


Figure 13. Case R2: simulated PCE concentrations after 28 years.

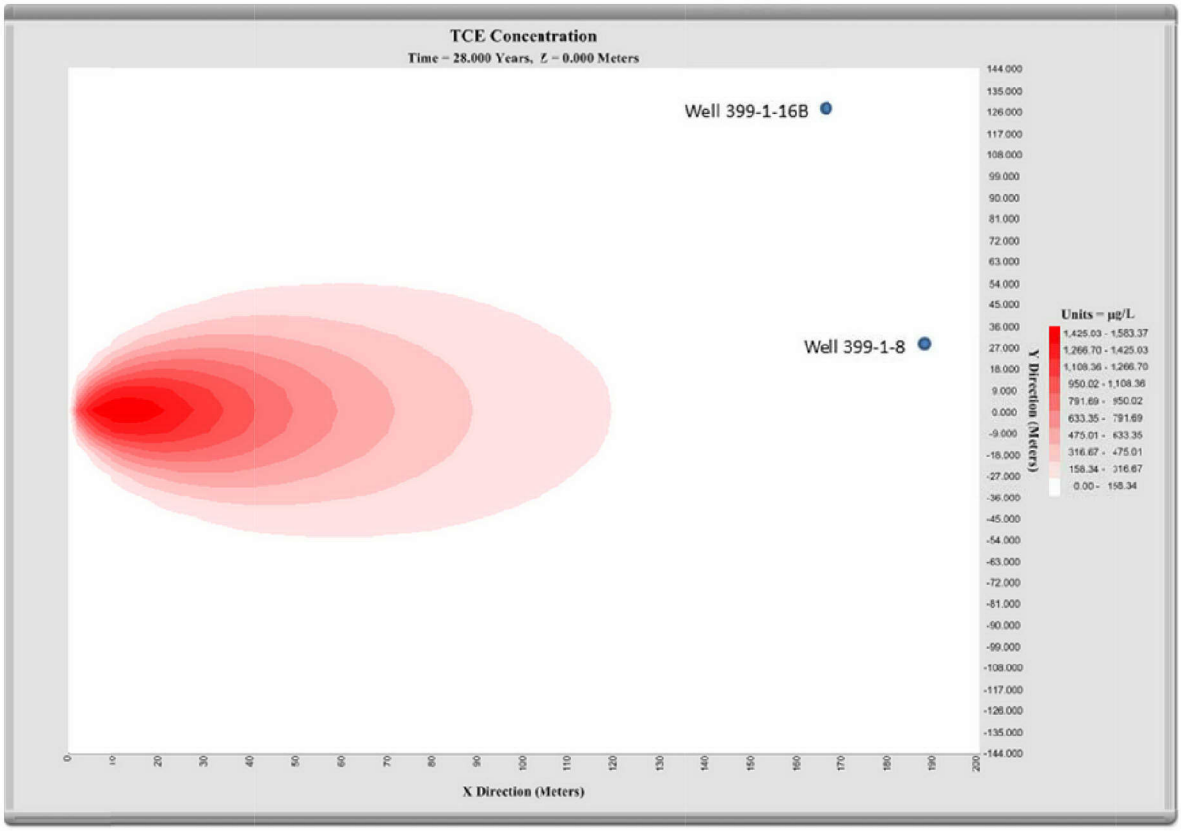


Figure 14. Case R2: simulated TCE concentrations after 28 years.

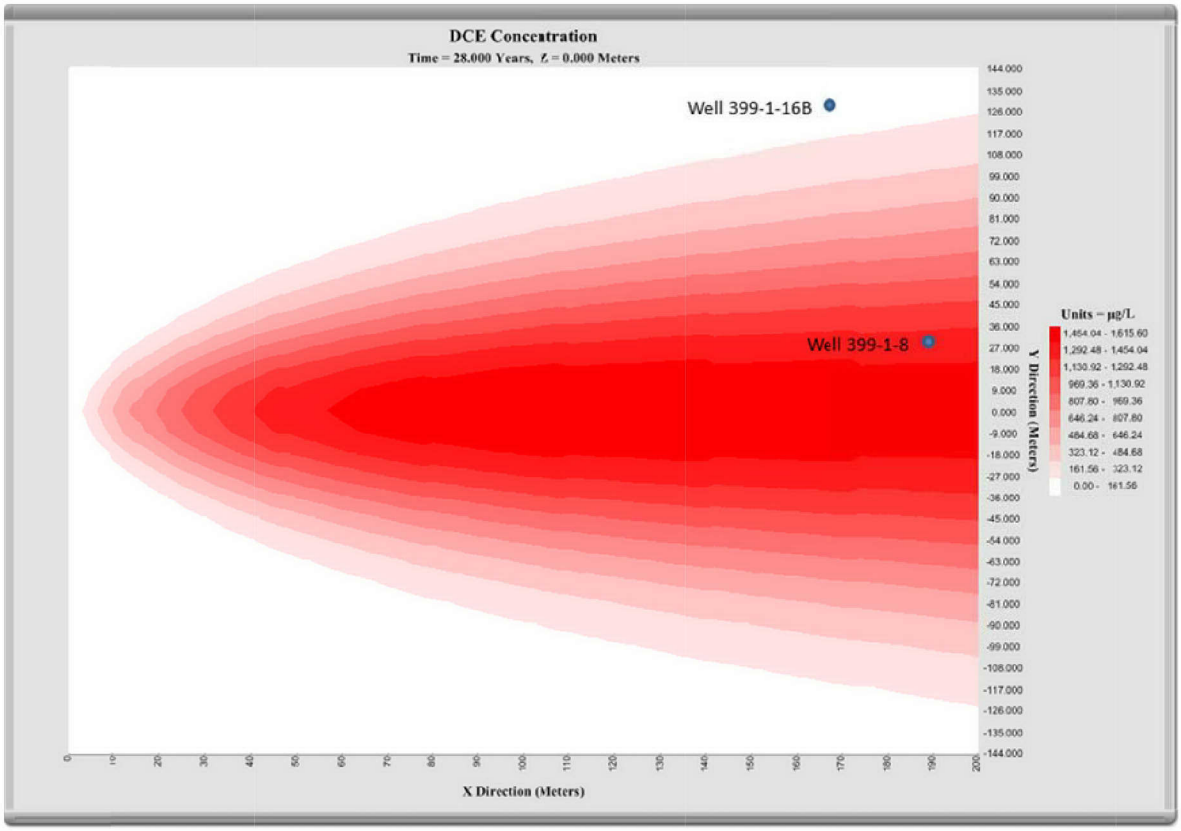


Figure 15. Case R2: simulated cDCE concentrations after 28 years.

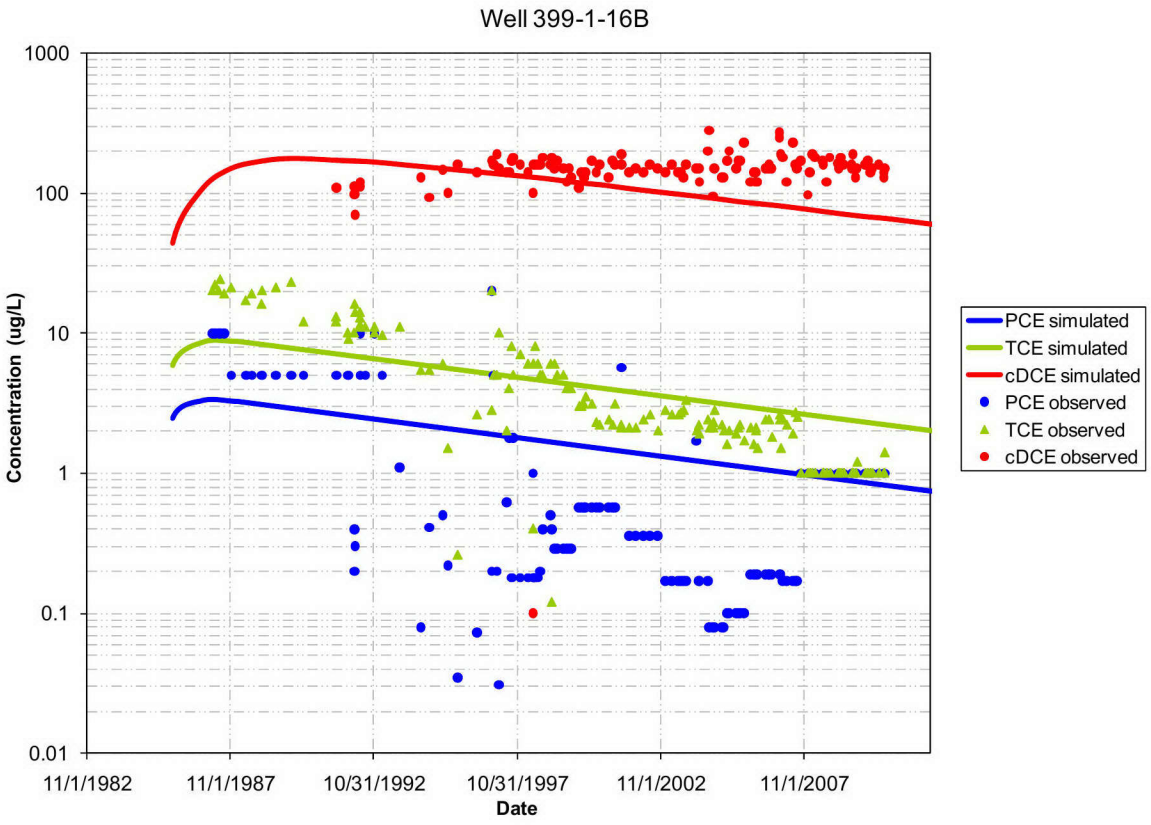


Figure 16. Case R2: simulated and observed concentrations in Well 399-1-16B.

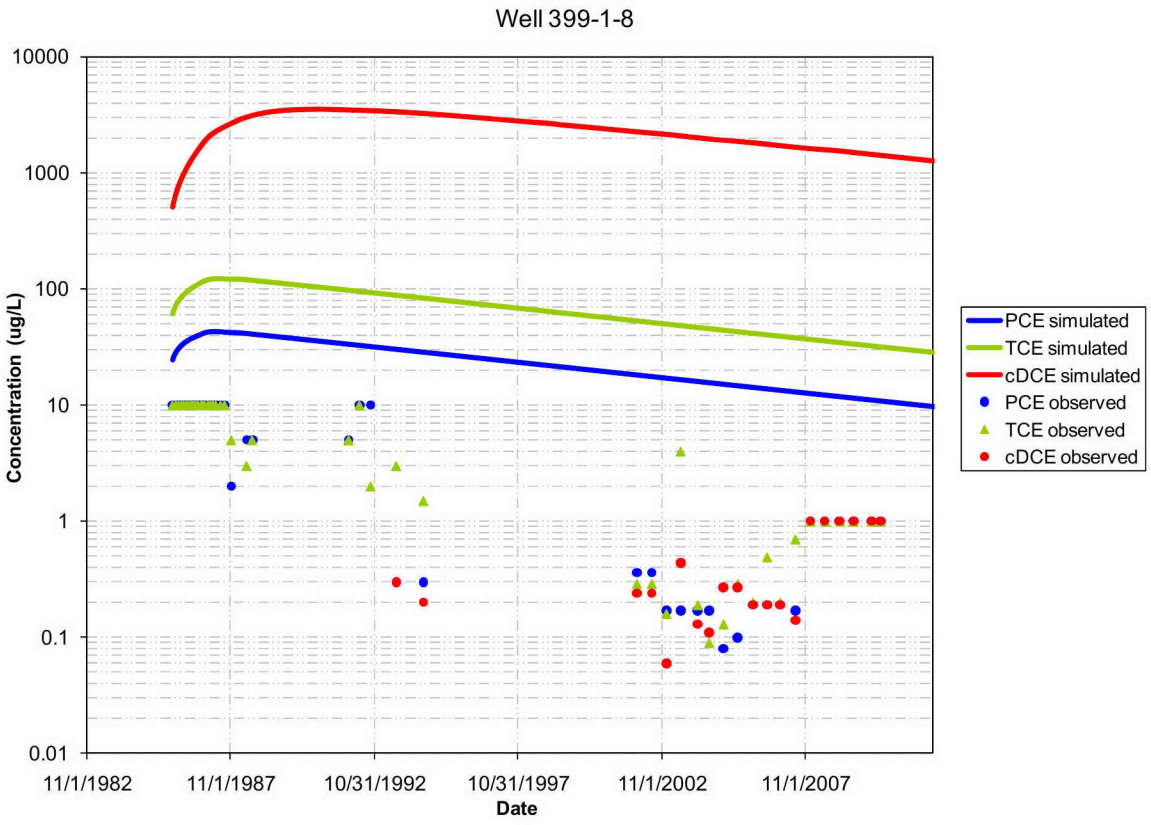
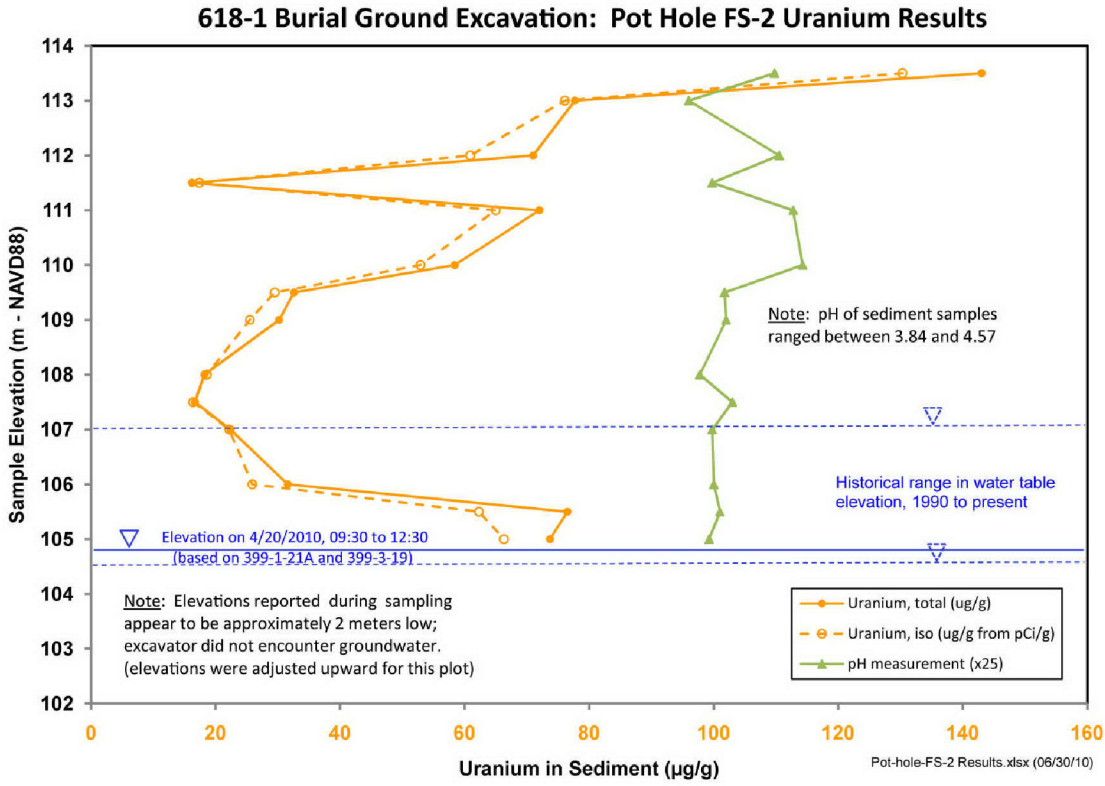


Figure 17. Case R2: simulated and observed concentrations in Well 399-1-8.



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Revision 2

STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for 300 Area Source Areas

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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**Approved for Public Release;
Further Dissemination Unlimited**

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Revision 2

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Environmental Calculation Cover Page

Part 1: Completed by the Responsible Manager

Project: 300 Area RI/FS **Date:** 8-May-2012

Calculation Title & Description: STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for 300 Area Source Areas

Preparer: A Mayenna and H Rashid	**Basis of Qualification:** Education & experience
Checker: N Hasan	**Basis of Qualification:** Education & experience
Senior Reviewer: A Hossain	**Basis of Qualification:** Education & experience

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1	Updated calculation to change source distributions used for PRG calculation	19-Nov-2011	All
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Part 3: Document Review & Approval:

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Terms

ARARs	applicable regulations and requirements
AWQL	applicable water quality standards
CHPRC	CH2M HILL Plateau Remediation Company
cm/s	centimeters per second (units)
cm^3/g	cubic centimeters per gram (units)
COPC	contaminant of potential concern
CPK	peak groundwater concentration
ECF	environmental calculation file
EQL	estimated quantitation limit
FEPs	features, events, and processes
HEIS	Hanford Environmental Information System (environmental database)
HISI	Hanford Information System Inventory (software database)
LIDAR	Light Detection and Ranging
m	meter(s)
µg/L	micrograms per liter
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
mL/g	milliliters per gram
PNNL	Pacific Northwest National Laboratory
POCal	point of calculation
PRG	preliminary remediation goal
OU	Operable Unit
RAG	remedial action goal
RESRAD	RESidual RADiation (modeling software)
STOMP	Subsurface Transport Over Multiple Phases (modeling software)

SZ	saturated zone
VZ	vadose zone
WQS	water quality standard

1. Purpose

The objective of this environmental calculation file (ECF) is to provide screening values and preliminary remediation goals (PRGs) for protection of surface water and groundwater in the 300-FF-5 Groundwater Operable Unit (OU) using the STOMP (Subsurface Transport Over Multiple Phases) fate and transport simulation software. For the purposes of this ECF, the 300-FF-5 Groundwater Operable Unit OU is hereafter referred to generically as the 300 Area.

PRGs represent the soil concentration or radioisotope activity that can remain in the vadose zone at each area without causing an exceedance of groundwater or surface water regulatory standards. Based on numerical flow and solute transport simulations using a number of conservative assumptions, two types of PRGs for applicability to two recharge scenarios (native vegetation and industrial) were calculated for 191 non-radionuclides and 28 radionuclides in groundwater and 191 non-radionuclides in surface water (the Columbia River).

Conceptual and numerical models of flow and solute transport under variably saturated conditions were developed for conditions that are representative of the lithology and hydrology observed at observed at various waste sites within 300 OU. Conditions specific to the 300 Area or source areas include time-varying recharge rates specific to the 300 Area, OU-specific vadose zone thickness and lithology, area-specific hydraulic properties, and OU-specific aquifer fluxes. The numerical model implementing the conceptual model is developed assuming that aqueous-phase flow under variably saturated conditions follows the Richards equation and that transport of dilute solutes follows the advection-dispersion equation with radioactive decay and linear sorption and no volatilization or hydrodynamic dispersion.

Contaminant migration from waste sites in the 300 Area through the vadose zone to the underlying aquifer is controlled by the driving forces, interactions between water and sediments, and interactions between the contaminants and the sediments. The hydraulic driving forces include gravity; matric potential gradients; recharge, which is the end result of competition between precipitation, evaporation, transpiration, infiltration, run-off, and run-on; and man-made discharges, such as those from septic tank leach fields, ponds, lagoons, pipe and tank leaks, and irrigation. The types, thicknesses, and properties of the sediments can all affect the rate and direction of solute and water movement to the aquifer. A contaminant's concentration in the groundwater and its concentration in the downgradient Columbia River, including the peak concentration, are dependent on the solute flux from the vadose zone; aquifer thickness, properties, and flux rates; travel distance; groundwater and river water mixing; and the location sampled. Each contaminant's propensity to sorb to vadose zone or aquifer materials can also be important controlling factors on the groundwater concentration determination.

The STOMP-W operational mode of STOMP was used to solve the Richards equation and the advection-dispersion equation that govern water flow and solute transport, respectively, under variably saturated conditions in porous media. The STOMP numerical simulations provided predictions of groundwater concentration and time to reach the breakthrough of the maximum concentrations for a list of contaminants based on a range of recharge rates, sediment types, vadose-zone thicknesses, and properties appropriate to the 300 Area. The peak concentration within 1000 years was used in screening and PRG value calculation. The 1000 year time period was based on regulatory decision.

The screening and PRG values resulting from the simulations and calculations are only intended to apply to sites that share the same set of conditions and assumptions that form the basis of this calculation.

2. Methodology

Calculation of PRG values for the 300 Area included the use of one-dimensional numerical fate and transport simulations. The STOMP code was selected to perform the simulations on the basis of its ability to adequately simulate the vadose zone features, events, and processes (FEPs) relevant to calculating PRGs in the 300-Area and to satisfy the other code criteria and attributes identified in DOE/RL-2011-50, *Regulatory Basis and Implementation of a Graded approach to Evaluation of Groundwater Protection*, a document that describes the approach and provides the regulatory basis for using STOMP in this type of evaluation. This section of this ECF summarizes the methodology employed to produce screening values and two types of PRG values for the 300 Area using the STOMP code.

2.1 Preliminary Remediation Goals

PRGs represent the maximum quantity, whether soil concentration or radionuclide activity, of a contaminant of potential concern (COPC) that can remain in the vadose zone without causing an exceedance of applicable regulatory standards. PRGs can be defined for protection of groundwater or protection of surface water simply by the choice of the applicable standard used in the calculation. There are two types of PRG calculation mentioned in this document native vegetation recharge scenario and industrial recharge scenario while the screening value calculation is based on much higher (bounding) irrigation recharge scenario (Section 3.2.1). Both the PRG values for a particular COPC depend on a number of key factors. These key factors are:

- waste site characteristics, specifically, source mass distribution and distance to the water table
- land cover condition and the associated net recharge rate
- interactions between the vadose zone geology and water movement
- interactions between the vadose zone geology and contaminant chemistry

Model simulations were carried out for the non-radionuclide identified in ECF-Hanford-10-0442 Rev. 1, *Calculation of Nonradiological Soil Concentrations Protective of Groundwater Using the Fixed Parameter 3-Phase Equilibrium Partitioning Equation for the 100 Areas and 300 Area* and radionuclides identified in ECF-Hanford-10-0429 Rev. 0, *Documentation of Preliminary Remediation Goals (PRGs) for Radionuclides Using the IAROD Exposure Scenario for the 100 and 300 Area Remedial Investigation/Feasibility Study (RI/FS) Report.* Groundwater PRG values were calculated for each of these COPCs and surface water PRGs were calculated for all non-radionuclide COPCs.

2.2 Identifying Representative Stratigraphic Columns

Using 300 Area borehole lithological data, a suite of stratigraphic columns were identified that would be representative of the subsurface beneath for 300 Area waste sites. The gravel-dominated Hanford formation is the only lithologic unit present within the 300 Area vadose zone. Thus the representative stratigraphic columns were selected based on the range of vadose-zone thicknesses observed in the 300 Area. A total five stratigraphic columns were selected for use in the STOMP simulations (see Section 3.1).

2.3 STOMP Flow and Transport Simulations

Peak groundwater concentrations in the aquifer beneath a typical waste site within each of the representative stratigraphic columns were calculated using STOMP to solve the governing equations for

flow and solute transport under variably saturated conditions. Peak concentrations of selected contaminants listed in Section 3.3, were calculated for two different contaminant source distributions, as described in Section 3.2.3, with three recharge scenarios (native vegetation, industrial, and irrigation) having three different soil types controlling infiltration plus an industrial recharge scenario for disturbed soil (Section 3.2.1) for each representative stratigraphic column (Section 3.1).

2.4 Estimation of 1000 year Peak Groundwater Concentrations

Peak groundwater concentrations within 1000 years were calculated for each model time step along a portion of the domain's downgradient boundary corresponding to the top five meters of the aquifer. The average concentration for the topmost 5 m was assumed to be an estimate of the groundwater concentration that would be measured within a 20-ft-long monitoring well screen that straddled the water table. Using the upper 5 meters of the aquifer is consistent with the requirements for aquifer mixing zone thickness in WAC 173-340-747[5][f][i] , which specifies that the aquifer mixing zone thickness shall not exceed 5 meters in depth. The concentration was conservatively estimated by calculating it in the aquifer beneath the downgradient edge of the waste site footprint. These groundwater concentrations and the year that they occurred were tabulated to find the peak concentration of contaminant in ground water and its year of occurrence. For contaminants not simulated in STOMP, peak groundwater concentrations were calculated by a regression equation or linear interpolation method (Section 5.3).

2.5 Calculating Screening Level and Preliminary Remediation Goal (PRG) Values

A simple calculation was employed to compute screening values and PRG values by scaling the peak concentration values against the regulatory compliance criteria and the initial soil concentration. As a measure of allowable quantity of contaminant in the soil, PRGs are expressed as contaminant mass per unit mass of soil for non-radionuclides or as contaminant activity per unit mass of soil for radionuclides. For both recharge scenarios the PRG for each contaminant is computed as:

$$PRG = aC_I \frac{WQS}{CPK} \qquad \text{Eqn. 1}$$

where PRG = Preliminary Remediation Goal (contaminant mass or activity / kg of soil]), a is a constant selected to balance units, C_I is the initial soil concentration (typically contaminant mass or activity / mass of soil), WQS = water quality standard (contaminant mass or activity / liter of water), and CPK = peak groundwater concentration (typically contaminant mass or activity / liter of water) resulting from the initial soil concentration C_I. The surface water quality standards are input as WQS to compute PRGs protective of surface water, whereas the groundwater quality standards are input as WQS to compute PRGs protective of groundwater.

3. Assumptions and Inputs

Two sequential STOMP simulations were used to determine peak groundwater concentrations. The first stage, called the pre-2010 model, simulated flow through the representative columns for a 2,010-year period ending in the year 2010 AD; the only purpose of this arbitrarily long simulation period is merely to achieve equilibrium (steady state) in the flow conditions in the model domain. Review of the first-stage matric potential and volumetric water content values over the last 100 years revealed that they had reached equilibrium prior to the end of the simulation. Results from the pre-2010 simulations provided initial aqueous pressure conditions for the 1,000-year-long second stage simulation, the post-2010 model, which solved for both flow and solute transport. The post-2010 solute transport simulations tracked the

fate of contaminants with different distribution coefficients and decay constants through the vadose zone and into the aquifer. These results were used to identify the peak groundwater concentrations and year of peak concentration.

STOMP estimates of contaminant concentration depend on the model inputs and assumptions. Inputs to the models and their underlying assumptions can be divided into the following categories:

- Model domain
- Boundary and initial conditions
- Hydraulic and transport parameters
- Initial contaminant source distribution

Each of these is discussed in the sub-sections below.

3.1 Model Domain

Conceptually, the model represents a column of sediments comprised of a vadose zone underlain by an aquifer. Water flow moves vertically downward through the vadose zone as a result of gravitational and capillary forces, where it encounters the underlying unconfined aquifer where a pressure gradient results in horizontal flow under saturated conditions. Diluted, mobilized contaminants are transported with the water in this system, with additional transport processes including advection, diffusion, adsorption and desorption affecting the rate of transport. At the start of each post-2010 simulation, the vadose zone comprises a cover of clean fill with constant thickness as well as contaminated and uncontaminated sediments of varying thickness. The aquifer constitutes the base of the column with a minimum thickness of 5 m so that a 5-m-long monitoring well screen could be simulated. In the 300 Area the vadose zone and saturated zone is comprised only of the Hanford formation.

The model represents the vadose zone as a vertical, one-dimensional column of evenly-spaced grid blocks, each containing a node at the centroid. In STOMP, boundary conditions are specified at the faces of the grid blocks, so each grid block is assigned an arbitrary but constant length to avoid large grid Courant numbers in the aquifer grid blocks during transport simulations. Each grid block is 0.25 m in height and 10 m in length. A length of 10 m was chosen to reduce the Courant number below 1.0 to reduce numerical errors. The Courant number represents a simple guideline for selecting grid element and time step size to limit numerical dispersion in advection dominated problems (Huyakorn and Pinder, 1983). In practice, the time step is easier to control in a simulation because the grid is fixed in advance. STOMP includes an automatic Courant limitation scheme that automatically subdivides transport time steps within flow solution time steps to ensure the Courant limit is maintained throughout the computational mesh; this feature of STOMP was used in this calculation. Following the simulation, the contaminant aqueous concentration output was scaled back to 1 m length by taking the aqueous concentrations and dividing by 10. The accuracy of this methodology was verified through simulation with varying grid dimensions (not presented here).

Grid block Courant numbers for the aquifer grid blocks, in which flow is horizontal under fully saturated conditions, was all less 1.0. Grid block Courant numbers for the vadose zone grid blocks, in which flow is predominately vertical for variably saturated conditions, were all less than 1.0 for all recharge scenarios.

The thickness of the vadose zone varies according to the geology of each waste site in the 300 Area. The range in vadose zone thicknesses across the 300 Area was calculated by taking the difference between the

ground surface and a single selected water table surface. The ground surface data was obtained from Hanford Site-wide LIDAR (Light Detection and Ranging) data. This data was then converted into raster format in ArcGIS®[1]. The March 2009 water table elevation map that was presented in the 2009 Groundwater Annual Report (DOE/RL-2010-11, *Hanford Site Groundwater Monitoring and Performance Report for 2009 Volumes 1 and 2*) was selected because the surface covered a large areal extent and encompassed all of the 300 Area waste sites. The water table contour was converted to a raster file in ArcGIS® environment and then subtracted from the ground surface map to calculate the vadose zone thickness across the 300 Area. Then the vadose zone thickness at each waste site location was determined. The determined vadose zone thickness for the 300 Area waste sites ranges between 6.8 m and 16.7 m, as noted in Table 1.

Because of natural variability in the thickness of various hydrostratigraphic units it is not practical to calculate PRG values for all possible variations in thicknesses observed in the various boreholes. Instead, representative stratigraphic columns were identified. Representative columns were identified by collecting and reviewing geologic data from 103 boreholes nearest to the waste sites in each geographic area. All borehole data were taken from the Hanford Environmental Information System (HEIS) borehole database. The columns include the vadose zone and the unconfined aquifer. Using water table elevations to represent the annually occurring highest water table, a conservative (smaller) thickness of the VZ was computed for each borehole. The borehole data also provided estimates of the thicknesses of each lithologic unit within the vadose zone and within the aquifer. The boreholes were divided into groups based on the proportion of each lithologic unit and total vadose zone thickness. This process yielded five representative vadose zone thicknesses of 6.5, 9.5, 12.5, 14.5 and 16.5 m (Figure 1). In addition to the 5-m thick saturated zone and the selected vadose-zone thickness, each model column was assumed to contain clean backfill to represent conditions resulting from interim remediation activities. The backfill was assumed to replace the uppermost 4.5 m of each column (Figure 1).

3.2 Boundary Conditions and Initial Conditions

Solving the governing equations for variably-saturated flow and transport requires stipulation of boundary conditions and initial conditions. A complete set of boundary and initial conditions must be stipulated for each governing equation.

For water flow, a specified-flux boundary condition was applied at the surface to represent recharge, no-flow boundary conditions were assigned to the edges of the vadose zone and the bottom of the saturated aquifer, and prescribed pressure boundaries were assigned to the edges of the saturated aquifer (Figure 2a). The prescribed pressures were selected to create the water table at the desired elevation and with the desired hydraulic gradient.

For solute transport, specified zero flux boundaries were applied at the top of the model domain, along both edges of the vadose zone, along the up-gradient edges of the aquifer grid blocks, and the bottom of the aquifer (Figure 2b). The downgradient edges of the aquifer grid blocks were assigned STOMP's outflow solute boundary condition (see page 6.21 of PNNL-12030, *STOMP Subsurface Transport Over Multiple Phases: Theory Guide*, and page 4.4 of PNNL-15782, *STOMP Subsurface Transport Over Multiple Phases: User's Guide Version 4.0*), which transports solute out of the domain according to the advective flux term in the governing equation and does not allow solute to enter back into the domain (Figure 2b).

[1] ArcGIS is a registered trademark of ESRI, Inc.

3.2.1 Recharge

The net infiltration into the vadose zone, which is used in the model to represent the recharge into the aquifer, is driven by the competition between precipitation, potential evaporation, transpiration, run-off and run-on. In an arid climate, downward fluxes resulting from this competition are episodic and usually infrequent, but this effect is typically damped towards a nearly constant rate with depth as soil moisture variability with depth measured at Hanford Site lysimeters shows (PNNL-17841, *Compendium of Data for the Hanford Site (Fiscal Years 2004 to 2008) Applicable to Estimation of Recharge Rates*). This is the basis for representing recharge in the vadose zone model using a constant rate applicable to a given soil type and vegetation cover (DOE/RL-2011-50, *Regulatory Basis and Implementation of a Graded Approach to Evaluation of Groundwater Protection*). Because some waste sites will be in industrial use areas while others in unrestricted use areas, two recharge scenarios are used to develop PRG values so the appropriate value may be selected by waste site. In contrast, soil screening level values are developed for all sites under an irrigation scenario (most conservative with greatest recharge).

3.2.1.1 Native Vegetation Recharge Scenario

A number of studies have been carried out at the Hanford site to ascertain representative long-term averages of the episodic fluxes, i.e., recharge rates, such as those compiled in Pacific Northwest National Laboratory (PNNL-14702 Rev. 1, *Vadose Zone Hydrology Data Package for Hanford Assessments for the 100 Areas)* and reported as well in DOE/RL-2011-50. The 300 Area-specific recharge rates in PNNL-14702 Rev. 1 varied with surface soil type and so provide an estimate of the range of possible recharge rates for various land uses. The three surface soil types were the Ephrata sandy loam, Burbank sandy loam and Rupert sand. Each vadose zone representative stratigraphic column is simulated with each of these three soil types as the surface soil; this is implicit to the model. That is, the soil cover and evapotranspiration processes are not directly simulated; rather, the effective recharge rate applicable to each soil cover and vegetation cover are applied as a flux rate to the upper boundary of each representative vadose zone column.

For the pre-2010 simulations, land use and recharge rates were assumed to change from shrub-steppe (during the Hanford pre-operational period) to bare soil (Hanford operational period) for each soil type. Base recharge rates for each type of land cover for each soil type were applied to the top boundary from the year 0 to 1944 for the pre-operational period (an arbitrarily long period to allow the full soil profile to stabilize at equilibrium) and from 1944 to 2010 for the operational period (Table 2).

For the post-2010 simulations, two different land use/cover scenarios were evaluated (Table 3). The first, termed the native vegetation recharge scenario, evaluated the transition of surface cover from bare soil to mixed grass and shrub cover to mature shrub steppe cover. The second scenario, termed the irrigation recharge scenario, evaluated an increase in recharge due to irrigation farming practices following the period of bare soil cover. The third scenario, termed the industrial recharge scenario, evaluated the transition of surface cover from bare soil to a permanently disturbed, cheatgrass dominated cover. The recharge rates were assumed to change over time in step function-fashion for these recharge scenarios (except for a linear transition in the industrial scenario from bare soil to cheatgrass).

To account for the change in the land use/cover over time in the post-2010 simulations, three recharge time periods were specified to represent the changes in recharge rates (Table 3 and Figure 3). The first recharge period (Period 1), spans from 2010 to 2015 and represents the period of bare soil cover. Recharge Period 2 represents different land use/covers for each of the two recharge scenarios. For the native vegetation recharge scenario, the second recharge period lasts 30 years and represents grasses and shrubs covering bare soil. This is followed by establishment of a mature shrub steppe for Period 3 which lasts for the remainder of the simulation period. The recharge rates decreased with time for the native vegetation recharge scenario (Table 3 and Figure 3).

3.2.1.2 Irrigation Recharge Scenario

Recharge rates for the irrigation scenario were estimated using the same approach employed to assess interim remediation at 100 Area waste sites (DOE/RL-96-17 Rev. 6, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*). These previous site assessments used Remedial Action Goals (RAGs) calculated from RESRAD (RESidual RADiation) simulations that assumed total recharge was a combination of irrigation and non-irrigation (native vegetation) recharge rates. As the native vegetation recharge rates used in the RESRAD simulations were different than those adopted from PNNL-14702 Rev. 1, the RESRAD equation for total recharge was solved to determine the rate attributable to irrigation alone. According to the RESRAD manual, total recharge is a function of precipitation, evapotranspiration, run-off, and applied irrigation and is defined as

$$I = (1 - C_e)[(1 - C_r)P_r + I_{rr}] \qquad \text{Eqn. 2}$$

in which I = annual recharge rate (LT-1), C_e = evapotranspiration coefficient (dimensionless), C_r = runoff coefficient (dimensionless), P_r = annual precipitation rate (LT^{-1}), and I_{rr} = annual irrigation rate (LT^{-1}). Solving Equation 2 with I_{rr} = 0 yielded the non-irrigation total recharge rate of 11.6 mm/yr and therefore the recharge attributable to irrigation alone was 68.4 mm/yr, which was then added to the native vegetation recharge scenario rates (Table 3) to determine a recharge rate for the irrigation scenario for each soil type. For example, the irrigation scenario for the Ephrata soils set the recharge rate to 17 mm/yr from 2010 to 2015, 71.4 mm/yr from 2015 to 2045, and 69.9 mm/yr from 2045 to 5010 (Table 3 and Figure 3).

3.2.1.3 Industrial Recharge Scenario

An industrial scenario is developed with regulator agreement to evaluate representative conditions for land surface that remains in a permanently disturbed condition as a consequence of industrial land use. In this scenario, recharge begins with a steady state of 50 mm/yr and continues at this rate for five years. This rate is similar to that measured rate of 51 mm/yr for an area covered with gravelly sand at the Hanford Solid Waste Landfill from data collected over a 22-year period with less than 5 percent vegetation cover (DOE/RL-2011-50, Table 4-7). Next, the rate transitions linearly from 50 mm/yr to 25 mm/yr over a period of 5 years, representing the establishment of a cheatgrass community. Thereafter, the surface is assumed to remain in a permanently disturbed state with the cheat grass community unchanged. The 25 mm/yr rate for cheatgrass is similar to the measured rate of 25.4 mm/yr at the "Grass Site" in the 300 Area covered with coarse-grained soil and cheat grass (DOE/RL-2011-50, Table 4-7). These values also are shown in Table 3.

Table 1. Vadose Zone Thickness of 300 Area Waste Sites

Waste Site	Thickness of Vadose Zone (m)
300-10	12.4
300-18	13.4
300-259	16.4
300-275	9.5
300-44	13.3
300-45	12.9
300-49	6.8
300-50	10.0
300-8	14.9
300 ASH PITS	15.1
300 VTS	16.3
316-1	14.4
316-2	11.1
316-5	13.8
331 LSLDF	11.0
600-243	14.6
600-259	16.7
600-47	12.7
618-1	16.4
618-12	12.0
618-13	15.3
618-3	15.6
618-4	12.9
618-5	16.1
618-7	16.2
618-8	15.2
618-9	13.7
628-4	12.3
618-2	9.7

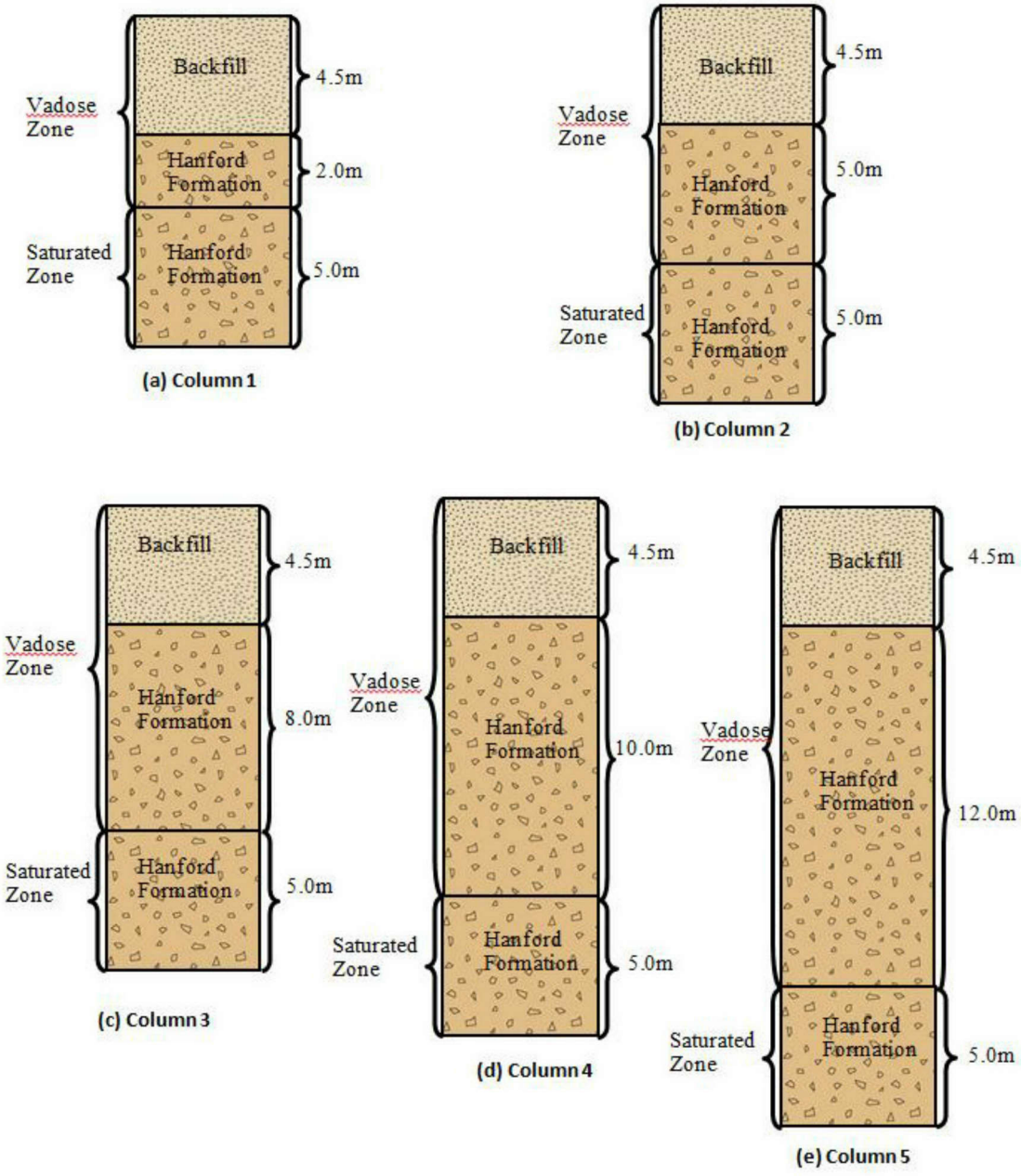


Figure 1. Representative Stratigraphic Columns for 300 Area

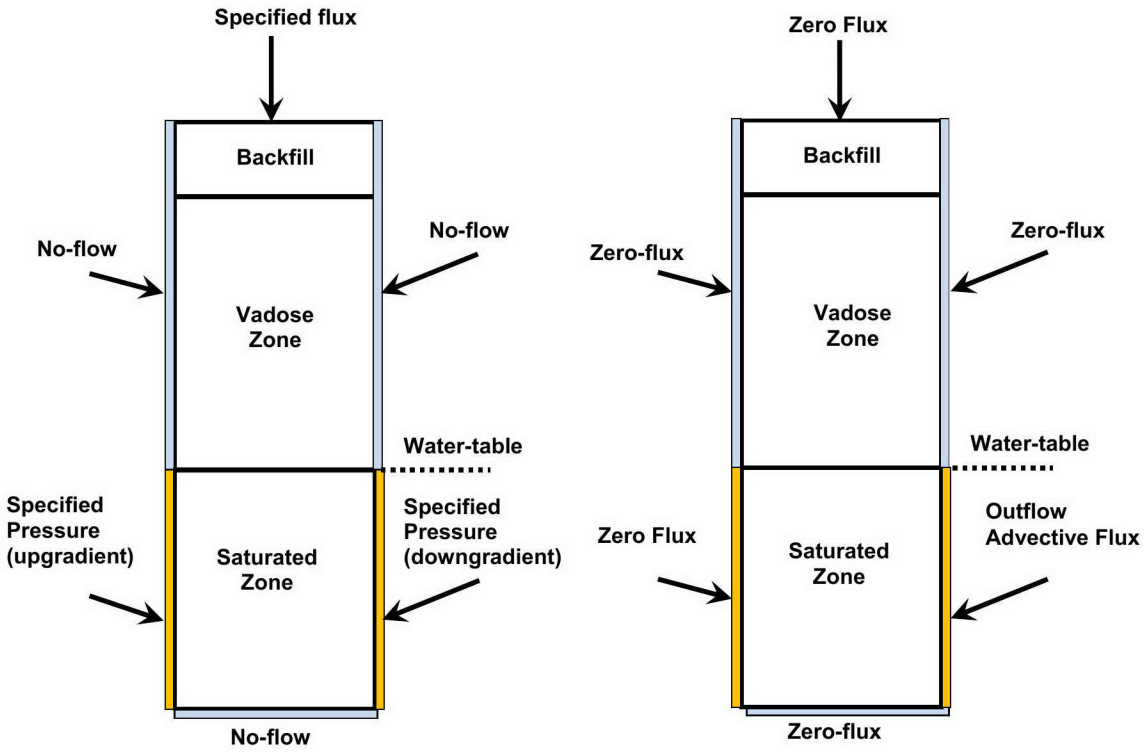


Figure 2. Boundary Conditions for (a) Flow and (b) Solute Transport

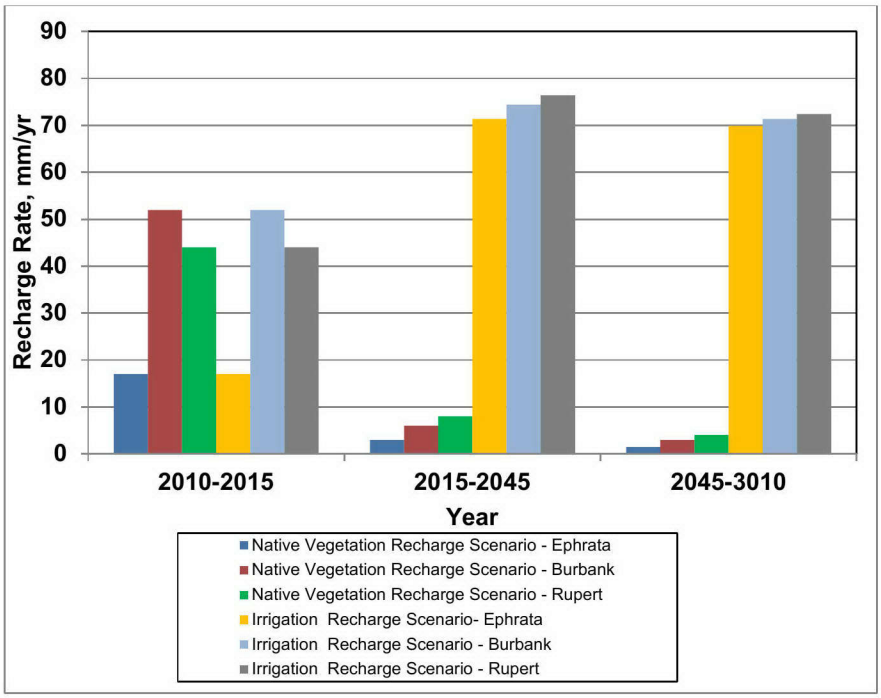
Table 2. Recharge Rates for Pre-2010 Simulations

Soil Type	Recharge Scenario	Recharge Rate for Different Period (mm/yr)	
		Establish Initial Steady-State	Operational Era
Native Vegetation and Irrigation		(0-1944)	(1944-2010)
Ephrata Sandy Loam and Stony Loam	Native Vegetation	1.5	17.0
	Irrigation		
Burbank Sandy Loam	Native Vegetation	3.0	52.0
	Irrigation		
Rupert Sand	Native Vegetation	4.0	44.0
	Irrigation		
Industrial		(0-1944)	(1944-2010)
Disturbed Soil	Industrial	25.0	50.0

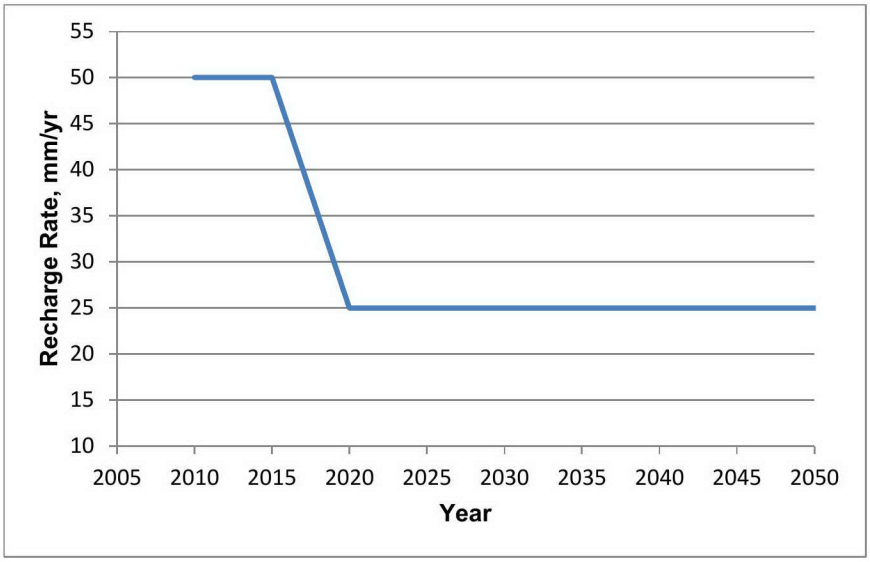
Table 3. Recharge Rates for Post-2010 Simulations

Soil Type	Recharge Scenario	Recharge Rate (mm/yr)		
		Period 1	Period 2	Period 3
Native Vegetation and Irrigation		(2010-2015)	(2015-2045)	(after 2045)
Ephrata Sandy Loam and Stony Loam	Native Vegetation	17.0	3.0	1.5
	Irrigation	17.0	71.4	69.9
Burbank Sandy Loam	Native Vegetation	52.0	6.0	3.0
	Irrigation	52.0	74.4	71.4
Rupert Sand	Native Vegetation	44.0	8.0	4.0
	Irrigation	44.0	76.4	72.4
Industrial		(2010-2015)	(2015-2020)	(after 2020)
Disturbed Soil	Industrial	50.0	50.0 to 25.0[a]	25.0

[a] linear transition from 50.0 to 25.0 mm/yr during period



(a) Native Vegetation and Irrigation Recharge Scenarios



(b) Industrial Recharge Scenario

Figure 3. Recharge Rates used in Post-2010 STOMP Simulations

3.2.2 Aquifer Gradient

The specified pressure values assigned to the edges of the saturated aquifer grid blocks were selected to create a hydraulic gradient across the model domain. The gradient was calculated by the following steps:

1. First water table contours within the Hanford formation were developed for the months of January, March, June, and December in 2009. These months were selected because there was a sufficient completeness of data available to develop a comprehensive surface. The June water table represents the highest stages of the annual cycle of river flows; the December water table represents the lowest stages. The contoured surfaces were developed using ArcGIS®.

2. After the contours were drawn for each month the flow lines were hand drawn.

3. Then the gradient was calculated for each segment in the flow line in between the contour lines.

4. For each waste site, a gradient was calculated for each of the four different months.

5. The average of the four gradients at each waste site was calculated.

6. The median value was determined for all the four-month averaged gradients to develop an overall average gradient of 0.00033 m/m.

3.2.3 Initial Conditions

An arbitrary value was assigned as the initial pressure for the pre-2010 flow simulations. A value of 86,656.7 Pascal, approximately equivalent to –1.5 m matric potential, was assigned to the nodes in the vadose zone whereas the aquifer grid blocks were assigned values that matched the boundary condition pressures. Final pressures from the pre-2010 simulations were used as the initial pressures for the post-2010 flow and transport simulations.

For contaminants with K_d < 2 mL/g, peak concentration occur within 1000 years while for K_d > 2 mL/g the peak concentration occurs after 1000 years. Observations of this behavior and implications are discussed in Section 3.5. Based on this consideration, contaminants are evaluated in two categories, one with low distribution coefficients < 2 mL/g and another one with the high distribution coefficients ≥ 2 mL/g for both screening value and PRG calculations. A different initial concentration condition is applied to these categories. A uniform concentration of 1 mg/kg was applied in the entire vadose zone below the clean backfill up to 0.5 m (two grid blocks) above the water table for the low K_d contaminants and mentioned here as effective 100:0 distribution. Initial concentration in the 0.5 m zone above the water table was not applied due to physical presence of capillary fringe and water table movement in the periodically rewetted zone that would result from river stage fluctuations. Placing the initial mass at the water table results in unrepresentative large peak releases in the simulation start as a result of the extreme concentration gradient that created by application of this initial condition. For the high K_d contaminants 70% of the vadose zone below the clean backfill was assumed to be contaminated with remaining 30% as uncontaminated (referred as 70:30 source distribution). This 70:30 source distribution assumption is considered to be conservative for the high K_d contaminants based on observed limited vertical extent (with the notable exception of uranium, which is addressed separately in ECF-300FF5-11-0151, *Groundwater Flow and Transport Modeling in Support of the 300 Area FF-5 RI/FS Document*).

The unit initial concentration is arbitrary but was chosen only for convenience in calculating PRG values and has no effect on the PRG values since the initial concentration C_I is accounted for in Equation 1.

3.3 Hydraulic and Transport Parameters

The hydraulic properties of the Hanford formation were assumed to follow the van Genuchten (1980) moisture retention constitutive relation and the Mualem –van Genuchten relative permeability constitutive relation (Mualem, 1976). Thus the following parameter values were required for each lithologic unit:

- K_s, saturated hydraulic conductivity, (LT^{-1})
- n_T, total porosity (L^3L^{-3}); assumed equivalent to diffusive porosity (n_D) in this calculation
- θ_s, saturated volumetric water content (L^3L^{-3})
- s_r, residual saturation (dimensionless); equal to the residual volumetric water content divided by the saturated volumetric water content
- α, van Genuchten inverse air entry head (L^{-1})
- n, the dimensionless van Genuchten exponential fitting parameter (dimensionless)

The van Genuchten m parameter was assumed to be fixed and equal to $(n - 1)/n$ and the Mualem β exponent was assumed to be fixed at 0.5 (Mualem, 1976; RPP-20621, *Far-Field Hydrology Data Package for the Integrated Disposal Facility Performance Assessment*). These Mualem-van Genuchten hydraulic parameters were obtained for the Hanford formation from PNNL-15125. A summary of the hydraulic parameters are listed in Table 4.

Hydraulic parameters were also required for the backfill portion of the model domain. The simulated peak groundwater concentrations will be insensitive to the backfill hydraulic parameters because contaminated vadose zone sediments are located beneath clean backfill in all source distribution models for all simulations. The backfill parameter values used for the 300 Area simulations (Table 4) were identical to those used in the 200 Area PRG calculation simulations (Table 8 in ECF-200MW1-10-0080, *200-MW-1 Contaminant Fate and Transport Model to Evaluate Impacts to Groundwater in Support of DOE/RL-2008-38 Decision Draft*; Table 11 in ECF-200PW1/3/6-10-0326, *Screening Process and Contaminant Fate and Transport Model to Evaluate Impacts to Groundwater in Support of DOE/RL-2007-27 Draft B*).

For transport simulations, STOMP requires the particle density (ρ_p) values of the backfill and Hanford formation. The particle density of each unit can be calculated using the bulk density (ρ_B) and porosity. Bulk density is necessary for retardation scaling factor calculations. Estimates of bulk density for Hanford formation were obtained from PNNL-14702 Rev. 1, which gave 1.93 g/cm^3 for the Hanford formation. The bulk density estimate of 1.94 g/cm^3 for backfill was obtained from PNNL-18564, *Selection and Traceability of Parameters to Support Hanford-Specific RESRAD Analyses*. Dispersion was conservatively assumed to be negligible, so dispersivity values were set to zero. Barring numerical dispersion introduced by the numerical solution technique, setting dispersivity values to zero yields higher peak concentrations than setting non-zero values and therefore yields conservative PRG values. One artifact of this approach is that the grid Peclet number (a dimensionless number that measures the degree of advection domination compared to hydrodynamic dispersion) becomes infinite. This can cause smearing of the sharp concentration front (by numerical dispersion) and could also lead to artificial oscillations at the concentration front. However, no appreciable numerical errors were noticed in the simulations and did not result in smearing the peak concentrations.

Distribution coefficient, K_d, for the chemicals were taken from ECF-Hanford-10-0442 Rev. 1 and for the radionuclides K_d and half-life values were taken from ECF-Hanford-10-0429 Rev. 0, and are listed in

Attachments A-1 and A-2 for each COPC. One exception to this is the K_d value for hexavalent chromium (Cr (VI)). The K_d value of Cr (VI), 0.8 mL/g, was estimated in ECF-Hanford-11-0165, Rev. 1, *Evaluation of Hexavalent Chromium Leach Test Data Conducted on Vadose Zone Sediment Samples from the 100-Area*. Simulations were run for 1000 years to produce peak groundwater concentrations for a subset of the entire range of distribution coefficients required for all contaminants. Typically, the subset comprised 26 distribution coefficients (Table 5) between 0 and 16 mL/g. Peak concentrations were estimated for the remaining distribution coefficients using either the scaling methods described in Section 5.3.

Table 4. Hydraulic Parameters used for 300 Area Simulations

Model Zone	Total Porosity n_D	Diffusive Porosity n_D	van Genuchten α (1/cm)	van Genuchten n	Residual Saturation s_r	Horizontal Saturated Hydraulic Conductivity $K_{s,h}$ (cm/s)	Vertical Saturated Hydraulic Conductivity $K_{s,v}$ (cm/s)
Backfill	0.276	0.262	0.0190	1.4	0.1620	5.98E-04	5.98E-04
Vadose	0.280	0.250	0.0824	2.0932	0.1516	1.7361	0.1736
Saturated	0.280	0.250	0.0824	2.0932	0.1516	1.7361	0.1736

Table 5. Distribution Coefficients Used in STOMP Simulations

K_d Values (mL/g)	
0.00000	0.6
0.00001	0.7
0.0001	0.8
0.001	0.9
0.01	1.0
0.02	2.0
0.04	4.0
0.06	6.0
0.08	8.0
0.1	10.0
0.2	12.0
0.3	14.0
0.4	16.0
0.5	

3.4 Point of Calculation and Protectiveness Metric

In accordance with risk assessment guidelines, the determination of soil contamination impacts to groundwater and surface water also requires the definition and rationale for (1) the Point of Calculation (POCal) i.e., the place/point in the groundwater domain where modeled groundwater concentrations are to

be assessed for potential impacts and protectiveness, and (2) the protectiveness metric, i.e., the groundwater and surface water metric(s) to be used in the assessment of protectiveness at the POCal (DOE/RL-2011-50).

The POCal for the protection of groundwater and surface water is related to the "Exposure Point" in the context of conventional human health risk assessments (EPA/540/1-89/002, *Risk Assessment Guidance for Superfund Volume 1, Human Health Evaluation Manual [Part A]*) and to "Point of Compliance" in federal and state regulations and guidelines (DOE/RL-2011-50). For this calculation, the POCal is the outflow (downgradient) edge of the 1-D column for the grid blocks that are located in the topmost five meters of the aquifer representing the screened portion of a monitoring well. The peak value of concentration within the topmost five meters of the aquifer was used to compare to the regulatory compliance criteria (Section 2.4).

The protectiveness metric is the set of applicable water quality standards for groundwater and surface water (e.g., applicable regulations and requirements [ARARs], maximum contaminant levels [MCLs], or applicable water quality standards [AWQLs]) values for each contaminant. The AWQL for each contaminant for protectiveness of groundwater and surface water in the 100-N Area are included in the Attachments A-1 and A-2.

3.5 Screening Levels and Preliminary Remediation Goals (PRGs)

The screening values and two types of PRG values were calculated assuming the most conservative set of input values. For the screening value calculation the maximum recharge (irrigation recharge scenario) was applied and one PRG value was calculated for the native vegetation recharge scenario and another PRG value was calculated for the industrial recharge scenario. PRGs for each recharge scenario are provided so that a waste site can be evaluated based on its zoned land use.

The peak concentration within the 1000 year simulation was used to calculate the screening value and two PRG values (native vegetation and industrial recharge scenarios). Note that, particularly for contaminants with greater sorption, peaks may occur beyond 1000 years but these are not calculated or reported because a 1000-year limit was established for purposes of PRG calculation by agreement with regulatory agencies. One set of test case simulations were run for selecting the low K_d and high K_d contaminants, for Column 1 as an example, the native recharge scenario for Burbank sandy loam soil and the same column for the industrial recharge scenario. The effective 100:0 distribution was used. The breakthrough curves for different distribution coefficients for the native vegetation recharge scenarios are shown in Figure 4. The simulations were run for 1000 years (calendar years 2010 to 3010); the end of the simulations is denoted by the vertical dashed line at year 3010 in these figures. Observation of the breakthrough curves in Figure 4 reveals that for $K_d < 2$ mL/g the peak concentration occurs within 1000 years and for $K_d > 2$ mL/g the peak concentration occurs after 1000 years. As a result, the contaminants were grouped into two groups, one with low distribution coefficients < 2 mL/g and another one with the high distribution coefficients ≥ 2 mL/g for both screening value and PRG calculations. For the low K_d contaminants effective 100:0 source distribution was used and for the high K_d contaminants 70:30 source distribution was used. The final screening value and two PRG values (native vegetation and industrial) for each recharge scenario is chosen by selecting the minimum value (lowest PRG value calculated from amongst all of the representative columns). If the minimum value thus obtained is below the estimated quantitation limit (EQL) for soil then EQL is substituted for screening and PRG value (as a lower threshold). The EQL values represent the lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. EQLs normally are arbitrarily set rather than explicitly determined, and for purposes of this calculation are specified in DOE/RL-2009-45, 2009, *300 Area Remedial Investigation/Feasibility Study Sampling and Analysis Plan for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units*.

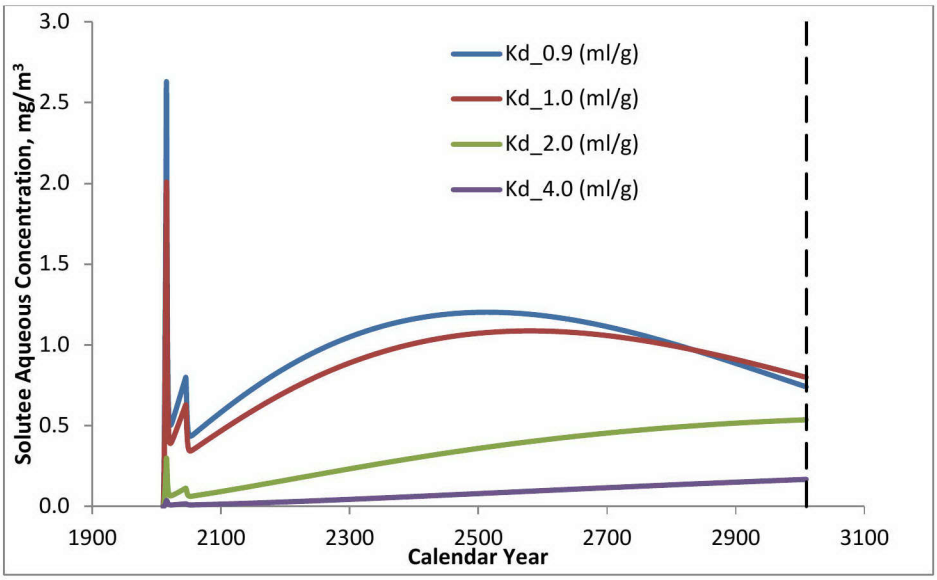


Figure 4. Breakthrough Curves for Select Distribution Coefficients with Native Vegetation Recharge Scenario

3.1 Uncertainties, Assumptions, and Conservatism

Potential sources of uncertainty in risk assessments are primarily in the categories of (1) model uncertainties, (2) scenario uncertainties, and (3) parameter uncertainties. Model uncertainty pertaining to the equations used as numerical representations of the natural processes is expected to be relatively small (DOE/RL-2011-50).

DOE/RL-2011-50 provides a summary evaluation of the comparisons of field data and field test results to corresponding model results obtained using the STOMP code, and the evaluation indicates that the equations used in STOMP adequately simulate the natural processes. The technical basis regarding scenario and parameter selection and the evaluation of uncertainty and variability is also documented in DOE/RL-2011-50. Documentation is provided in DOE/RL-2011-50 on (1) dominant model factors, (2) model parameter values and plausible ranges of parameter values, (3) model assumptions and effects on model results, and (4) model limitations.

Application of the PRG values calculated herein requires an understanding of which assumptions and modeling choices were conservative and which were not. Conservative assumptions and modeling choices include:

- Recharge was represented in the numerical model by uniform flux rates specified over particular time periods so that vadose zone flow is always downward. In contrast, recharge in an arid vadose zone occurs only as often as the combination of precipitation and antecedent moisture conditions allow, i.e., sporadically or infrequently, so that there can be long periods when shallow vadose-zone pore water movement is controlled more by evaporation and transpiration near the surface than gravity, resulting in upward movement or reduced downward seepage velocity.

- The one-dimensional simulations force all contamination through the vadose zone down to the aquifer, whereas infiltrating water and solutes tend to migrate laterally as the wetting front redistributes following an infiltration event.

- Dilution upon mixing of groundwater with Columbia River water is assumed to be negligible.
- Dispersion is assumed to be negligible, which leads to larger peak concentrations than if dispersion had been included.
- Volatile organic compounds are assumed to have negligible volatilization so that the resulting peak concentrations are larger than if volatilization had been included.
- Geometric means of measured aquifer horizontal hydraulic conductivity values are lower, and thus more conservative, than arithmetic means.

Assumptions that may or may not be conservative include:

- The median hydraulic gradient value may be too large by several-fold for waste sites near the Columbia River and may be several times too large for waste sites that are far inland from the river.
- The assumption of a five-meter-thick aquifer may or may not be conservative for those 300 Area locations with aquifer thicknesses less than five meters.

4. Software Applications

Microsoft Excel®[2] spreadsheets were used to calculate contaminant inventory values and approximate contaminant solute concentrations, back calculate PRG values, and evaluate the results produced by STOMP. These calculations were performed on a desktop with ID INTERA 00295. The hardware is a Dell Precision E7200 with a 2.53-GHz Intel(R) Core(TM)2 Duo CPU processor and 3.25 GB of RAM loaded with the Windows® XP Professional 64-bit operating system.

4.1 Approved Software

The vadose zone fate and transport calculations are performed using CH2M HILL Plateau Remediation Company (CHPRC) Build 2 of the STOMP software, registered in the Hanford Information System Inventory (HISI) under identification number 2471. STOMP use by CHPRC is managed under the following software lifecycle documents: CHPRC-00222 Rev. 1, *STOMP Functional Requirements Document*; CHPRC-00176 Rev. 2, *STOMP Software Management Plan*; CHPRC-00211 Rev. 1, *STOMP Software Test Plan*; CHPRC-00515 Rev. 1, *STOMP Acceptance Test Report*; and CHPRC-00269 Rev. 1, *STOMP Requirements Traceability Matrix*.

4.2 Description

The STOMP software package was used in the calculation; required information on this software is provided here:

- Software Title: STOMP
- Software Version: CHPRC Build 2

[2] Excel and Windows are registered trademarks of Microsoft Corporation in the United States and other countries.

- HISI Identification Number: 2471
- Workstation type and property number (from which software is run): STOMP was executed on the INTERA Richland GREEN Linux®[3] Cluster that is owned and managed by INTERA, Inc., a pre-selected subcontractor to CHPRC. The computer property tag identifier for the front end node is #469 at INTERA's Richland, Washington office. This node is a Dell PowerEdge R510 with two six-core Intel Xeon X5660 processors @ 2.80GHz and 48 GB of RAM. As given by the command "uname –a", the operating system details are:

```
Linux green 2.6.32-32-server #62-Ubuntu SMP Wed Apr 20 22:07:43
UTC 2011 x86_64 GNU/Linux (gcc version Ubuntu 4.4.3-4ubuntu5
4.4.3)
```

4.2.1 Software Installation and Checkout

A copy of the Software Installation and Checkout Form for the STOMP installation used for this calculation is provided in Attachment B of this ECF.

4.2.2 Statement of Valid Software Application

DOE/RL-2011-50 contains a summary of the main model attributes and code selection criteria that serve as the basis for the demonstration of the adequacy of the STOMP code for use in vadose zone modeling at Hanford. The results of the evaluation in DOE/RL-2011-50 show that the STOMP code is capable of meeting or exceeding the identified attributes and criteria. The comparison of the code selection criteria to the STOMP code capabilities indicates the STOMP code is capable of simulating all of the necessary FEPs, and that STOMP meets all of the other required code selection criteria. Section 6.4.1 of DOE/RL-2011-50 addresses code selection criteria, including quality assurance documentation of verification studies for specific model attributes (e.g., unsaturated flow, solute transport, infiltration, and drainage), and includes a discussion of other code related criteria (i.e., inter-code comparisons, hardware requirements, solution methodology, dimensionality, and output capability).

The results of CHPRC software acceptance testing (CHPRC-00515 Rev. 1) demonstrated that the STOMP software is acceptable for its intended use by the CHPRC. Installations of the software are operating correctly, as demonstrated by the INTERA Linux® cluster system producing the same results as those presented for selected problems from the STOMP application guide (PNNL-11216, *STOMP Subsurface Transport Over Multiple Phases: Application Guide*) in accordance with the *STOMP Software Test Plan* (CHPRC 00211 Rev. 1).

5. Calculation

STOMP simulations were created and run using the representative stratigraphic columns, boundary conditions, initial conditions, and parameter values described in Section 3. The details of screening value and PRG value calculation are described in the following sub-sections.

5.1 Time Steps and Solution Method

STOMP simulations were all run with a maximum time step of 0.01 years and grid dimension of 10 m (in the horizontal direction) and 0.25 m (in the vertical direction). Numerical error was controlled by use of

[3] Linux is a registered trademark of Linux Torvalds in the United States and other countries.

STOMP's automatic Courant limitation scheme to limit numerical dispersion. The flow simulations were run with the Newton-Raphson iteration method and transport simulations were solved using the Patankar solute transport method. The STOMP-W executable with banded matric solver was used for all simulations. The aqueous concentration output was scaled back to 1.0 m horizontal grid length by taking the aqueous concentrations and dividing by 10. The accuracy of this methodology was verified through simulation with varying grid dimensions (details not presented here).

5.2 Groundwater Concentration Calculation

Peak groundwater concentrations were calculated for each model time step along a portion of the domain's downgradient boundary corresponding to the top five meters of the aquifer. Fluxes through the downgradient boundary were written to a surface flux file, one of STOMP's standard output options. For each time step, STOMP writes the water mass and solute mass flux rates passing through the surface as well as the cumulative water and solute mass that have passed through the surface. Groundwater concentration within the 5-m-long surface was conservatively estimated by calculating it at the aquifer edge beneath the downgradient edge of the waste site footprint. The solute mass flux per unit time was divided by the water volume flux per unit time to yield a groundwater concentration at each time step.

5.3 Dilution Factors

Dilution factors are calculated following the Washington Administrative Code (WAC 173-340-747), wherein the dilution factor is the ratio of the combined aquifer and vadose zone water fluxes to the vadose zone water flux:

$$Df = \frac{Q_{VZ}+Q_A}{Q_{VZ}} \qquad \text{Eqn. 3}$$

where Df is the dimensionless dilution factor, Q_{VZ} is the volumetric flux from the vadose zone into the aquifer (L^3T^{-1}), and Q_A is the volumetric flux through the topmost five meters of the aquifer (L^3T^{-1}). The dilution factors for the representative stratigraphic columns for the 300 Area under each recharge scenario are listed in Table 6.

Table 6. Calculated Dilution Factors

Recharge Scenario	Dilution Factor[(a)]		
Surface Soil	Ephrata sandy loam	Burbank sandy loam	Rupert sand
Native Vegetation	6.02E+05	3.01E+05	2.26E+05
Irrigation	1.29E+04	1.27E+04	1.21E+04
Surface Soil	Disturbed soil		
Industrial	3.61E+04		

(a) Calculated per Washington Administrative Code (WAC 173-340-747).

5.4 Scaling of Peak Concentration

The results of peak concentration scaling are presented in Section 5.4.1 for the screening values (based on irrigation recharge scenario) and in Section 5.4.2 for PRG values (based on both the native vegetation and industrial recharge scenarios).

5.4.1 Estimation of Peak Concentration for Screening Level Values

Peak concentrations were calculated by running multiple simulations using STOMP for set of K_d values. Typically, the subset comprised of 27 K_d values ranging from 0 to 16 mL/g. For the contaminants with lower K_d values, the peak concentrations were estimated using the 'FORCAST' function of Excel®. The peak concentrations beyond the simulated K_d values were estimated using regression equation mentioned. An example is shown in Figure 5 using Column 1 with irrigation recharge for Ephrata sandy loam soil.

No breakthrough was assumed if the estimated peak concentration within 1000 years was found to be less than 1×10^{-4} µg/L for nonradioactive COPCs or 1×10^{-4} pCi/L for radionuclide COPCs. The "NR" symbol was used to denote those analytes with non-representative results. The "NR" symbol (denoting a non-representative result) was assigned for those COPCs for which no breakthrough occurred (under the 1000-year threshold limit just mentioned) in in at least four of the five representative columns, or when the calculated PRG value for any COPC was greater than 384,000 µg/kg. This condition was observed for analytes with K_d values greater than 50 mL/g and therefore the screening levels for all analytes with K_d greater than 50 mL/g are set assigned value "NR."

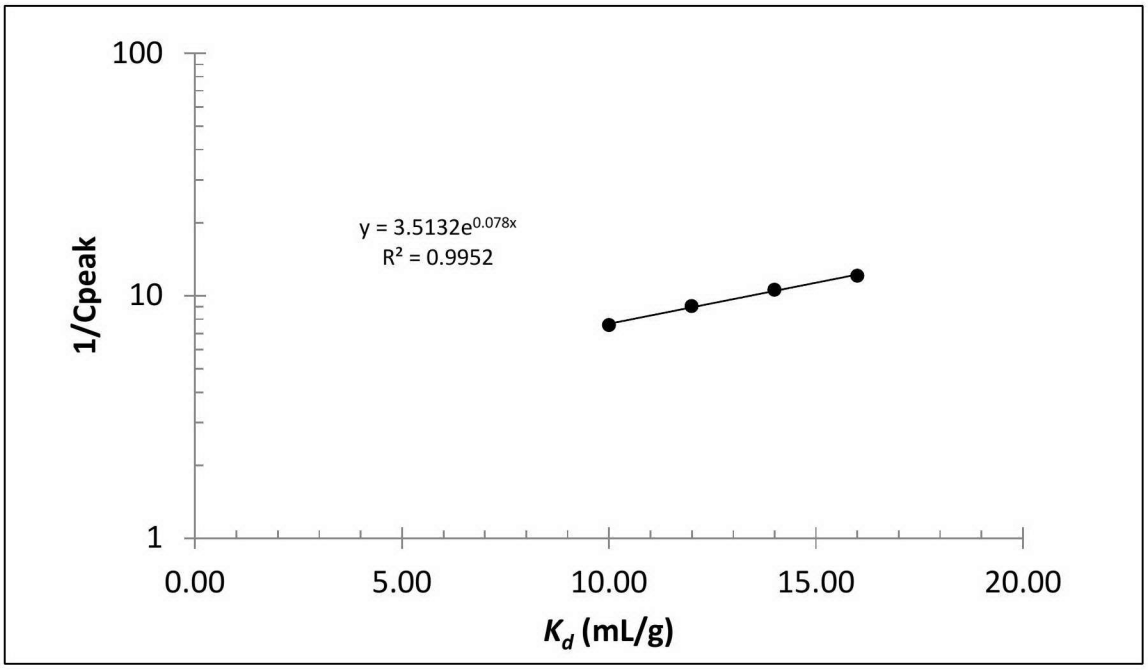


Figure 5. Non-linear Regression Equation for High K_d Contaminants

5.4.2 Estimation of Peak Concentration for Preliminary Remediation Goal (PRG) Values

Peak concentrations were calculated by using STOMP to simulate the set of K_d values listed in Table 5 (ranging from 0 to 16 mL/g) for each of the three recharge scenarios (native vegetation, industrial, and irrigation). The peak concentrations beyond the range of K_d values for which peak concentrations were calculated were estimated based on regression analysis (Section 5.4.1). It was assumed that no breakthrough occurred if the calculated peak concentration within 1000 years was less than 1×10^{-4} µg/L for non-radionuclide COPCs or 1×10^{-4} pCi/L for radionuclide COPCs. The "NR" symbol (denoting a non-representative result) was assigned for those COPCs for which no breakthrough occurred (under the 1000-year threshold limit just mentioned) in in at least four of the five representative columns, or when

the calculated PRG value for any COPC was greater than 384,000 µg/kg. This final condition (PRG values greater than 384,000 µg/kg) was found to occur for COPCs with a K_d value greater than 1 mL/g for the native vegetation recharge scenario and a K_d value greater than 20 mL/g for the industrial recharge scenario. Therefore, when K_d value was greater than 1 mL/g the PRG of the native vegetation is set to "NR" and for industrial recharge scenarios for K_d greater than 20 mL/g is set to "NR."

The soil screening levels obtained in this calculation are listed in Attachment A-1.

5.5 Calculation of Screening and Preliminary Remediation Goal (PRG) Values

Screening values and two types of PRG values were calculated from the peak groundwater concentrations using Equation 1 and the applicable surface water and groundwater regulatory standards. If simulated peak concentrations are very small, application of Equation 1 can lead to physically unrealistic soil concentrations, e.g., 10 kg of aluminum per kg of soil. Although not strictly necessary, the maximum PRG value was capped at an estimate of the total COPC mass that could occupy the void volume within a kilogram of soil. PRG values pertain to soil with pore water present, so in the $K_d = 0$ case (unsorbed COPC) where no contaminant is in the soil, the concentration accounts the pore water portion.

The bulk density (ρ_B) of the soil in the 300 Area is 1930 kg/m^3. For 1 kg of soil, the total volume (V_T) of the soil is:

$$\frac{1\ \text{kg}}{1930\frac{\text{kg}}{\text{m}^3}} = 5.18 \times 10^{-4}\ \text{m}^3$$

The COPC is assumed to fully occupy the diffusive or total porosity (in this calculation, the diffusive and the total porosity as formulated in STOMP were assumed equivalent). Thus, the maximum mass of COPC in the soil is:

$$m_{max,p} = n_T \times V_T \times \rho_p$$

where n_T is the total porosity and ρ_p is the particle density of the COPC. In the 300 Area, the total porosity of the Hanford formation is 0.28, and the particle density of the COPC is assumed to equal the particle density of the soil, 2650 kg/m^3 (PNNL-18564). The maximum mass of COPC in 1 kg soil is given by

$$m_{max,p} = (0.28) \times \left(5.18 \times 10^{-4}\ \text{m}^3\right) \times \left(2650\ \frac{\text{kg}}{\text{m}^3}\right)$$
$$= 0.384\ \text{kg} \times \left(\frac{1{,}000{,}000\ \text{mg}}{1\ \text{kg}}\right) = 3.84 \times 10^5 \text{mg}$$

Thus the maximum screening or PRG value for non-radionuclides is 384,000 mg per kg of soil. Any larger non-radionuclide PRG value was replaced with the 384,000 mg per kg of soil value.

The PRG values obtained in this calculation are listed in Attachment A-2.

6. Results/Conclusions

STOMP simulations and scaling calculations were used to estimate the two types of PRG values for 300 Area over a representative range of vadose zone thicknesses, soil types, and recharge scenarios.

Attachment A-1 contains the surface water and groundwater screening values for each soil type and representative column for the 300 Area. Attachment A-2 contains the PRG values for native vegetation recharge and industrial recharge scenarios for each soil type and representative column for the 300 Area. Note the following with regard to screening values and PRGs reported in Attachments A-1 and A-2:

- If the screening value or the PRG value for any analyte was calculated to be less than its EQL for soil concentration then the screening value or the PRG value was set to EQL for that analyte.
- The PRG values for Cr(VI) were limited to a maximum value of 6 mg/kg because the K_d value used in the model was derived from experiments with soil concentration less than 6 mg/kg, as there is no basis to infer greater PRGs for Cr(VI) based on these data so this conservative limit is applied (ECF-Hanford-11-0165 Rev. 1).
- No breakthrough was assumed if the estimated peak concentration within 1000 years was found to be less than 1×10^{-4} µg/L for non-radionuclide COPCs or 1×10^{-4} pCi/L for radionuclide COPCs. The "NR" symbol was used for these analytes to designate non-representative result (below a level of numerical significance). The "NR" symbol was also assigned when no breakthrough was observed one or fewer representative stratigraphic columns, or when the PRG value for any COPC exceeded than 384,000 µg/kg. This condition was observed for analytes with K_d greater than 1 mL/g for the native recharge case scenario and K_d greater than 20 mL/g for industrial recharge case scenario. For the screening value calculation the K_d value is greater than 50 mL/g.
- For some contaminants the applicable water quality standard was not available. For those contaminants "NA" symbol was used in screening and PRG values.

The PRG values resulting from the simulations and estimation are only intended to be applied to sites that share the same set of conditions and assumptions underpinning these calculations. Some waste sites may require a more rigorous investigation of site specific conditions than those underlying the screening and PRG values found in Attachments A-1 and A-2.

6.1 Evaluation of K_d Influence on Breakthrough

The column 1 was run with irrigation recharge scenario for Ephrata sandy soil with effective 100:0 source distribution. Figure 6 shows the breakthrough curves for different K_d values ranging from 0.9 – 8.0 mL/g. Observation of the break through curves from Figure 6 reveals that all the peak concentrations occur within 1000 year simulation time. As the irrigation recharge is really high it flushes the contaminants very fast through the vadose zone even with higher K_d values. The irrigation recharge scenario does not represent the actual site conditions; it is used as a limiting conservative condition for the purpose of calculation screening values only; those waste sites that do not pass the screening levels will be further evaluated using the appropriate PRG values for determination of site remediation actions.

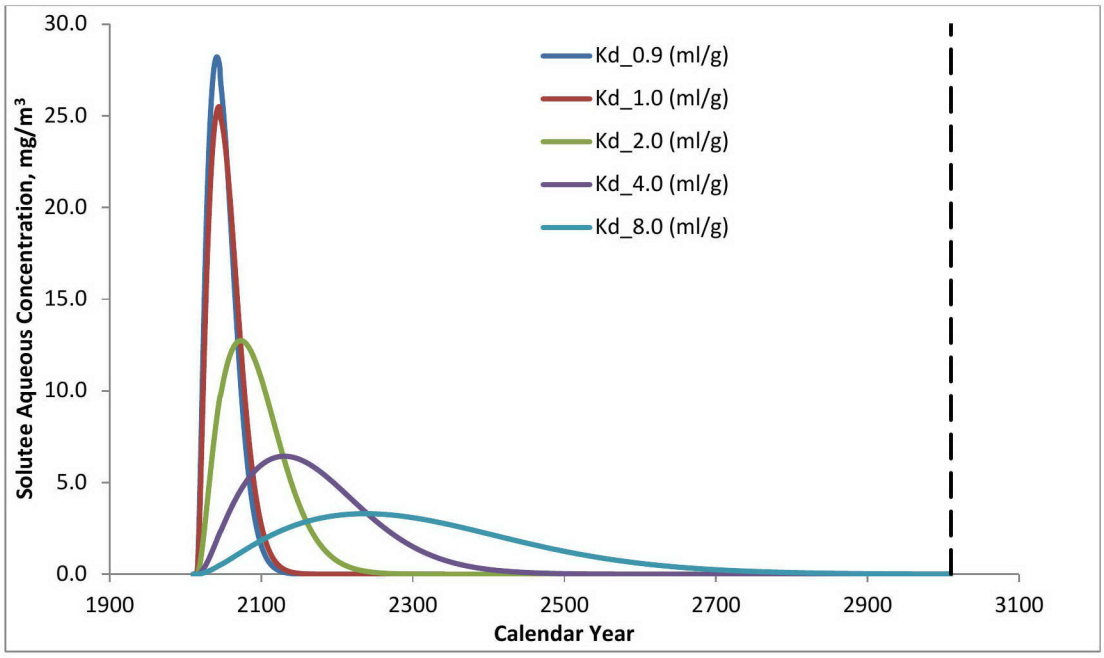


Figure 6. Breakthrough Curves for Select Distribution Coefficients with Irrigation Recharge Scenario

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Attachment A-1

Screening Values for 300 Area

Table A1-1. Groundwater Screening Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Groundwater Protection (ml/g)	Ground Water Standard (µg/L)	EQL (mg/kg)	Groundwater Screening Values (mg/kg) [1,2,3,4]
						300 Area
16887-00-6	Chloride	chloride	0	2.5E+05	2.00E+00	7.56E+04
14797-55-8	Nitrate	Nitrate	0	4.5E+04	2.50E+00	1.36E+04
14797-65-0	Nitrite	Nitrite	0	3.3E+03	2.50E+00	9.99E+02
NO3-N	Nitrogen in Nitrate	Nitrogen in Nitrate	0	1.0E+04	7.50E-01	3.03E+03
NO2-N	Nitrogen in Nitrite	Nitrogen in Nitrite	0	1.0E+03	7.50E-01	3.03E+02
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	Nitrogen in Nitrite and Nitrate	0	1.0E+04	---	3.03E+03
14808-79-8	Sulfate	sulfate	0	2.5E+05	5.00E+00	7.56E+04
51-28-5	2,4-Dinitrophenol	dinitrophenol;2,4-	0.00001	3.2E+01	8.25E-01	9.69E+00
67-64-1	Acetone	Acetone	0.0006	7.2E+03	2.00E-02	2.23E+03
107-21-1	Ethylene Glychol	Ethylene Glychol	0.001	16,000	---	5.03E+03
111-76-2	2-Butoxyethanol	Ethylene Glychol Mono Butyl Ether	0.001	800	---	2.51E+02
75-99-0	Dalapon	Dalapon	0.0027	200	---	6.60E+01
111-91-1	Bis(2-Chloroethoxy)methane	bis(2-chloroethoxyl)methane	0.00277	4.8E+01	3.30E-01	1.59E+01
78-93-3	2-Butanone	methyl ethyl ketone (MEK; 2-butanone)	0.00451	4.8E+03	1.00E-02	1.67E+03
74-87-3	Chloromethane	chloromethane	0.006	No Value	1.00E-02	NA
74-83-9	Bromomethane	bromomethane	0.009	1.1E+01	1.00E-02	4.53E+00
60-29-7	Diethylether	Diethylether	0.009699	1600	---	6.64E+02
75-09-2	Methylene chloride	methylene chloride	0.01	5.0E+00	5.00E-03	2.10E+00
108-10-1	4-Methyl-2-pentanone	methyl isobutyl ketone	0.0126	6.4E+02	1.00E-02	2.85E+02
591-78-6	2-Hexanone	HEXANONE;2-[MBK, methyl butyl ketone]	0.01498	4.0E+01	2.00E-02	1.89E+01
75-01-4	Vinyl chloride	vinyl chloride [chloroethene; 1-]	0.019	6.1E-02	5.00E-03	3.18E-02
75-00-3	Chloroethane	ethyl chloride	0.0217	No Value	1.00E-02	NA
621-64-7	n-Nitrosodi-n-dipropylamine	nitroso-di-n-propylamine;N-	0.024	1.3E-02	3.30E-01	3.30E-01
10061-01-5	cis-1,3-Dichloropropene	dichloropropene;1,2-,cis	0.027	4.4E-01	5.00E-03	2.63E-01
10061-02-6	trans-1,3-Dichloropropene	dichloropropene;1,3-,trans	0.027	4.4E-01	5.00E-03	2.63E-01
108-95-2	Phenol	Phenol	0.0288	2.4E+03	3.30E-01	1.49E+03
94-75-7	2,4-D	2,4-Dichlorophenoxyacetic acid	0.029	70	---	4.37E+01
1918-00-9	Dicamba	Dicamba	0.029	480	---	2.99E+02
131-11-3	Dimethyl phthalate	dimethyl phthalate	0.0316	No Value	3.30E-01	NA
156-59-2	cis-1,2-Dichloroethylene	dichloroethylene;1,2-,cis	0.036	7.0E+01	5.00E-03	4.98E+01
107-06-2	1,2-Dichloroethane	dichloroethane;1,2-	0.038	4.8E-01	5.00E-03	3.57E-01
156-60-5	trans-1,2-Dichloroethylene	dichloroethylene;1,2-,trans	0.038	1.0E+02	5.00E-03	7.42E+01
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	4-Amino-3,5,6-trichloropicolinic acid	0.039	500	---	3.79E+02
108-60-1	Bis(2-chloro-1-methylethyl)ether	bis(2-chloro-1-methyl-ethyl)ether	0.0392	6.3E-01	3.30E-01	4.76E-01
540-59-0	1,2-Dichloroethene (Total)	dichloroethylene,1,2- (mixed isomers)	0.0396	7.2E+01	5.00E-03	5.53E+01
75-69-4	Trichloromonofluoromethane	Trichloromonofluoromethane	0.04389	2400	---	1.95E+03
75-15-0	Carbon disulfide	carbon disulfide	0.046	8.0E+02	5.00E-03	6.66E+02
78-59-1	Isophorone	isophorone	0.0468	4.6E+01	3.30E-01	3.87E+01
78-87-5	1,2-Dichloropropane	dichloropropane;1,2-	0.047	1.2E+00	5.00E-03	1.03E+00
93-76-5	2,4,5-T	2,4,5-Trichlorophenoxyacetic acid	0.049	160	---	1.39E+02

Table A1-1. Groundwater Screening Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Groundwater Protection (ml/g)	Ground Water Standard (µg/L)	EQL (mg/kg)	Groundwater Screening Values (mg/kg) [1,2,3,4]
						300 Area
99-09-2	3-Nitroaniline	nitroaniline, 3-	0.0516	4.2E+00	3.30E-01	3.73E+00
100-01-6	4-Nitroaniline	nitroaniline, 4-	0.0516	4.4E+00	3.30E-01	3.92E+00
88-74-4	2-Nitroaniline	nitroaniline, 2-	0.0527	1.6E+02	3.30E-01	1.46E+02
75-34-3	1,1-Dichloroethane	dichloroethane;1,1-	0.053	1.6E+03	1.00E-02	1.46E+03
67-66-3	Chloroform	chloroform	0.053	1.4E+00	5.00E-03	1.29E+00
75-27-4	Bromodichloromethane	bromodichloromethane	0.055	7.1E-01	5.00E-03	6.63E-01
71-43-2	Benzene	Benzene	0.062	8.0E-01	5.00E-03	8.20E-01
124-48-1	Dibromochloromethane	chlorodibromomethane [dibromochloromethane]	0.063	5.2E-01	5.00E-03	5.42E-01
75-35-4	1,1-Dichloroethene	Dichloroethene;1,1-	0.065	7.0E+00	1.00E-02	7.43E+00
606-20-2	2,6-Dinitrotoluene	dinitrotoluene;2,6-	0.0692	1.6E+01	3.30E-01	1.77E+01
106-47-8	4-Chloroaniline	chloroaniline;p-	0.0725	2.2E-01	3.30E-01	3.30E-01
79-00-5	1,1,2-Trichloroethane	trichloroethane;1,1,2-	0.075	7.7E-01	5.00E-03	9.05E-01
111-44-4	Bis(2-chloroethyl) ether	bis(2-chloroethyl)ether	0.076	4.0E-02	3.30E-01	3.30E-01
79-34-5	1,1,2,2-Tetrachloroethane	tetrachloroethane;1,1,2,2-	0.079	2.2E-01	5.00E-03	2.70E-01
93-72-1	2,4,5-TP	(2-(2,4,5-Trichlorophenoxy)propionic acid)Silvex	0.08	50	---	6.24E+01
84-66-2	Diethylphthalate	diethyl phthalate	0.082	1.3E+04	3.30E-01	1.62E+04
79-01-6	Trichloroethene	trichloroethylene (TCE)	0.094	4.9E-01	5.00E-03	6.90E-01
121-14-2	2,4-Dinitrotoluene	dinitrotoluene;2,4-	0.0955	2.8E-01	3.30E-01	4.02E-01
94-82-6	2,4-DB	(4-(2,4-Dichlorophenoxy)butanoic acid)	0.1	128	---	1.90E+02
98-95-3	Nitrobenzene	Nitrobenzene	0.119	1.6E+01	3.30E-01	2.59E+01
75-25-2	Bromoform	bromoform	0.13	5.5E+00	5.00E-03	9.48E+00
71-55-6	1,1,1-Trichloroethane	Trichloroethane;1,1,1-	0.14	2.0E+02	5.00E-03	3.61E+02
108-88-3	Toluene	Toluene	0.14	6.4E+02	5.00E-03	1.15E+03
120-83-2	2,4-Dichlorophenol	dichlorophenol;2,4-	0.147	2.4E+01	3.30E-01	4.50E+01
56-23-5	Carbon tetrachloride	carbon tetrachloride	0.152	3.4E-01	5.00E-03	6.49E-01
100-41-4	Ethylbenzene	ethylbenzene	0.2	4.0E+00	5.00E-03	1.06E+01
108-38-3	m-Xylene	Xylene, m-	0.2	1.6E+03	---	4.27E+03
105-67-9	2,4-Dimethylphenol	dimethylphenol;2,4-	0.209	1.6E+02	3.30E-01	4.39E+02
108-90-7	Chlorobenzene	chlorobenzene	0.22	1.0E+02	5.00E-03	2.84E+02
1330-20-7	Xylenes (total)	Xylenes (total)	0.23	1.6E+03	1.00E-02	4.70E+03
95-47-6	o-Xylene	xylene,o-	0.24	1.6E+03	---	4.87E+03
127-18-4	Tetrachloroethene	tetrachloroethylene	0.27	8.1E-02	5.00E-03	2.75E-01
88-75-5	2-Nitrophenol	nitrophenol;2-	0.297	No Value	6.60E-01	NA
100-02-7	4-Nitrophenol	nitrophenol;4-	0.309	1.3E+02	6.60E-01	5.04E+02
95-50-1	1,2-Dichlorobenzene	dichlorobenzene;1,2- (ortho-Dichlorobenzene)	0.379	6.0E+02	3.30E-01	2.84E+03
88-06-2	2,4,6-Trichlorophenol	Trichlorophenol2,4,6-	0.381	4.0E+00	3.30E-01	1.89E+01
95-57-8	2-Chlorophenol	Chlorophenol;2-	0.388	4.0E+01	3.30E-01	1.94E+02
541-73-1	1,3-Dichlorobenzene	dichlorobenzene;1,3	0.434	No Value	3.30E-01	NA
95-48-7	2-Methylphenol (cresol, o-)	cresol;o-	0.434	4.0E+02	3.30E-01	2.16E+03
106-44-5	4-Methylphenol (cresol, p-)	cresol;p-	0.434	4.0E+01	---	2.16E+02
59-50-7	4-Chloro-3-methylphenol	chloro-3-methylphenol;4-	0.4918	1.6E+03	3.30E-01	9.78E+03

Table A1-1. Groundwater Screening Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Groundwater Protection (ml/g)	Ground Water Standard (µg/L)	EQL (mg/kg)	Groundwater Screening Values (mg/kg) [1,2,3,4]
						300 Area
87-86-5	Pentachlorophenol	pentachlorophenol	0.592	7.3E-01	3.30E-01	5.35E+00
534-52-1	4,6-Dinitro-2-methylphenol	dinitro-2-methylphenol;4,6-	0.6015	1.3E+00	3.30E-01	9.55E+00
106-46-7	1,4-Dichlorobenzene	dichlorobenzene;1,4- (para-Dichlorobenzene)	0.616	8.1E+00	5.00E-03	6.17E+01
91-94-1	3,3'-Dichlorobenzidine	dichlorobenzidine;3,3'-	0.724	1.9E-01	3.30E-01	1.74E+00
18540-29-9	Hexavalent Chromium	chromium(VI)	0.8	4.8E+01	---	6*
100-42-5	Styrene	styrene	0.91	1.0E+02	5.00E-03	1.15E+03
91-20-3	Naphthalene	naphthalene	1.19	1.6E+02	1.00E-01	2.26E+03
86-30-6	n-Nitrosodiphenylamine	nitrosodiphenylamine;N-	1.29	1.8E+01	3.30E-01	2.67E+02
58-89-9	Gamma-BHC (Lindane)	lindane [gamma-BHC] (see hexachlorocyclohexane)	1.35	8.0E-02	1.65E-03	1.23E+00
84-74-2	Di-n-butylphthalate	di-butyl phthalate	1.57	1.6E+03	3.30E-01	2.85E+04
95-95-4	2,4,5-Trichlorophenol	Trichlorophenol;2,4,5-	1.6	8.0E+02	3.30E-01	1.46E+04
120-82-1	1,2,4-Trichlorobenzene	trichlorobenzene;1,2,4-	1.66	1.5E+00	3.30E-01	2.87E+01
319-84-6	Alpha-BHC	hexachlorocyclohexane;alpha (alpha-BHC, HCH)	1.76	1.4E-02	1.65E-03	2.85E-01
67-72-1	Hexachloroethane	hexachloroethane	1.78	3.1E+00	3.30E-01	6.51E+01
126-73-8	Tributyl phosphate	Tributyl phosphate	1.89	9.51	---	2.17E+02
959-98-8	Endosulfan I	Endosulfan I	2.04	9.6E+01	1.65E-03	2.46E+03
33213-65-9	Endosulfan II	Endosulfan II	2.04	9.6E+01	3.30E-03	2.46E+03
1031-07-8	Endosulfan sulfate	Endosulfan sulfate	2.04	No Value	3.30E-03	NA
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	hexachlorocyclohexane;beta-	2.14	4.9E-02	1.65E-03	1.28E+00
319-86-8	Delta-BHC	hexachlorocyclohexane;delta-	2.81	No Value	1.65E-03	NA
91-58-7	2-Chloronaphthalene	beta-chloronaphthalene	2.98	6.4E+02	3.30E-01	2.14E+04
91-57-6	2-Methylnaphthalene	methylnapthalene;2-	2.98	3.2E+01	3.30E-01	1.07E+03
7440-42-8	Boron	Boron	3	3.2E+03	2.00E+00	1.08E+05
7005-72-3	4-Chlorophenylphenyl ether	chlorodiphenyl ether;4-	3.08	No Value	3.30E-01	NA
86-74-8	Carbazole	carbazole	3.39	4.4E+00	3.30E-01	1.69E+02
7723-14-0	Phosphorus	phosphorus	3.5	1.6E-01	5.00E+01	5.00E+01
88-85-7	Dinoseb	2-secButyl-4,6-dinitrophenol	3.5	7	---	2.83E+02
7440-36-0	Antimony	antimony	3.76	6.0E+00	6.00E-01	2.70E+02
7782-49-2	Selenium	selenium and compounds	5	5.0E+01	1.00E+00	3.02E+03
208-96-8	Acenaphthylene	acenaphthylene (Not in CLARC database tables; use acenaphthene as surrogate)	5.03	No Value	1.00E-01	NA
83-32-9	Acenaphthene	acenaphthene	6.12	9.6E+02	1.00E-01	7.38E+04
86-73-7	Fluorene	fluorene	7.71	6.4E+02	3.00E-02	6.17E+04
76-44-8	Heptachlor	heptachlor	9.53	1.9E-02	1.65E-03	2.39E+00
53494-70-5	Endrin ketone	Endrin ketone	9.72	No Value	3.30E-03	NA
57-12-5	Cyanide	cyanide	9.9	2.0E+02	---	2.54E+04
11104-28-2	Aroclor-1221	aroclor 1221 [PCB]	10.3	4.4E-02	1.65E-02	5.77E+00
11141-16-5	Aroclor-1232	aroclor 1232 [PCB]	10.3	4.4E-02	1.65E-02	5.77E+00

Table A1-1. Groundwater Screening Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Groundwater Protection (ml/g)	Ground Water Standard (µg/L)	EQL (mg/kg)	Groundwater Screening Values (mg/kg) [1,2,3,4]
						300 Area
72-20-8	Endrin	endrin	10.8	2.0E+00	3.30E-03	2.76E+02
7421-93-4	Endrin aldehyde	Endrin aldehyde	10.8	No Value	3.30E-03	NA
132-64-9	Dibenzofuran	dibenzofuran	11.3	1.6E+01	3.30E-01	2.32E+03
85-68-7	Butylbenzylphthalate	butyl benzyl phthalate	13.8	4.6E+01	3.30E-01	8.41E+03
85-01-8	Phenanthrene	Phenanthrene	16.7	No Value	5.00E-02	NA
7439-98-7	Molybdenum	molybdenum	20	8.0E+01	2.00E+00	2.58E+04
7440-50-8	Copper	copper	22	6.4E+02	1.00E+00	2.41E+05
120-12-7	Anthracene	anthracene	23.5	4.8E+03	5.00E-02	NR
7440-39-3	Barium	Barium	25	2.0E+03	5.00E-01	NR
7439-89-6	Iron	Iron	25	3.0E+02	5.00E+00	1.43E+05
7440-24-6	Strontium	strontium	25	9.6E+03	1.00E+00	NR
60-57-1	Dieldrin	dieldrin	25.6	5.5E-03	3.30E-03	2.73E+00
7440-38-2	Arsenic	arsenic, inorganic	29	5.8E-02	1.00E+00	3.80E+01
7440-43-9	Cadmium	cadmium	30	5.0E+00	2.00E-01	3.52E+03
7439-92-1	Lead	lead	30	1.5E+01	5.00E-01	1.06E+04
7439-97-6	Mercury	mercury	30	2.0E+00	---	1.41E+03
7440-66-6	Zinc	zinc	30	4.8E+03	1.00E+00	NR
12672-29-6	Aroclor-1248	aroclor 1248 [PCB]	43.9	4.4E-02	1.65E-02	9.11E+01
53469-21-9	Aroclor-1242	aroclor 1242 [PCB]	44.8	4.4E-02	1.65E-02	9.77E+01
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	ddd	45.8	3.6E-01	3.30E-03	8.81E+02
309-00-2	Aldrin	aldrin	48.7	2.6E-03	1.65E-03	7.79E+00
206-44-0	Fluoranthene	fluoranthene	49.1	6.4E+02	5.00E-02	NR
7440-48-4	Cobalt	Cobalt	50	4.8E+00	2.00E+00	NR
7439-93-2	Lithium	Lithium	50	3.2E+01	2.50E+00	NR
7439-96-5	Manganese	manganese	50	5.0E+01	5.00E+00	NR
5103-71-9	Alpha-Chlordane	Alpha-Chlordane	51	2.5E-01	1.65E-02	NR
57-74-9	Chlordane	chlordane	51	2.5E-01	1.65E-02	NR
87-68-3	Hexachlorobutadiene	hexachlorobutadiene	53.7	5.6E-01	3.30E-01	NR
7440-02-0	Nickel	nickel soluble salts	65	1.0E+02	4.00E+00	NR
129-00-0	Pyrene	pyrene	68	4.8E+02	5.00E-02	NR
7440-28-0	Thallium	Thallium, soluable salts	71	5.0E-01	5.00E-01	NR
11097-69-1	Aroclor-1254	aroclor 1254 (PCB)	75.6	4.4E-02	1.65E-02	NR
118-74-1	Hexachlorobenzene	hexachlorobenzene	80	5.5E-02	3.30E-01	NR
72-43-5	Methoxychlor	methoxychlor	80	4.0E+01	1.65E-02	NR
1024-57-3	Heptachlor epoxide	Heptachlor epoxide	83.2	4.8E-03	1.65E-03	NR
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	dde	86.4	2.6E-01	3.30E-03	NR
7440-22-4	Silver	silver	90	8.0E+01	2.00E-01	NR
8001-35-2	Toxaphene	toxaphene	95.8	8.0E-02	1.65E-01	NR
12674-11-2	Aroclor-1016	aroclor 1016 (PCB)	107	5.0E-01	1.65E-02	NR
117-81-7	Bis(2-ethylhexyl) phthalate	bis(2-ethylhexyl) phthalate	110	6.0E+00	3.30E-01	NR
7440-31-5	Tin	tin	130	9.6E+03	1.00E+01	NR
16984-48-8	Fluoride	fluoride (using fluorine)	150	9.6E+02	5.00E+00	NR
7440-47-3	Chromium	chromium (total)	200	1.0E+02	2.00E-01	NR
218-01-9	Chrysene	Chrysene	200	1.2E+00	1.00E-01	NR
77-47-4	Hexachlorocyclopentadiene	hexachlorocyclopentadiene	200	4.8E+01	3.30E-01	NR
56-55-3	Benzo(a)anthracene	Benzo(a)anthracene	360	1.2E-01	1.50E-02	NR

Table A1-1. Groundwater Screening Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Groundwater Protection (ml/g)	Ground Water Standard (µg/L)	EQL (mg/kg)	Groundwater Screening Values (mg/kg) [1,2,3,4]
						300 Area
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	ddt	678	2.6E-01	3.30E-03	NR
7440-41-7	Beryllium	beryllium	790	4.0E+00	2.00E-01	NR
205-99-2	Benzo(b)fluoranthene	Benzo(b)fluoranthene	803	1.2E-01	1.50E-02	NR
11096-82-5	Aroclor-1260	aroclor 1260 (PCB)	822	4.4E-02	1.65E-02	NR
7440-62-2	Vanadium	vanadium	1000	8.0E+01	2.50E+00	NR
207-08-9	Benzo(k)fluoranthene	Benzo(k)fluoranthene	1230	1.2E-01	1.50E-02	NR
7429-90-5	Aluminum	Aluminum (soluble)	1500	5.0E+01	5.00E+00	NR
53-70-3	Dibenz[a,h]anthracene	Dibenz[a,h]anthracene	1790	1.2E-01	3.00E-02	NR
191-24-2	Benzo(ghi)perylene	BENZO(g,h,i)PERYLENE (using pyrene as a surrogate)	1950	No Value	3.00E-02	NA
193-39-5	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	3470	1.2E-01	3.00E-02	NR
50-32-8	Benzo(a)pyrene	Benzo(a)pyrene	5500	1.2E-02	1.50E-02	NR
117-84-0	Di-n-octylphthalate	di-n-octyl phthalate	83000	No Value	3.30E-01	NA
65794-96-9	3+4 Methylphenol (cresol, m+p)	methylphenol,3+4 (cresol, m+p)	No Value	No Value	3.30E-01	NA
101-55-3	4-Bromophenylphenyl ether	bromodiphenyl ether;4-	No Value	No Value	3.30E-01	NA
7440-69-9	Bismuth	Bismuth	No Value	No Value	1.00E+01	NA
24959-67-9	Bromide	Bromide	No Value	No Value	2.50E+00	NA
7440-70-2	Calcium	Calcium	No Value	No Value	1.00E+02	NA
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	Co-elution of Aroclor 1242 and Aroclor 1017	No Value	No Value	---	NA
7439-95-4	Magnesium	Magnesium (Not in CLARC database Tables)	No Value	No Value	7.50E+01	NA
14265-44-2	Phosphate	Phosphate	No Value	No Value	5.00E+00	NA
PO4-P	Phosphorus in phosphate	Phosphorus in phosphate	No Value	No Value	---	NA
7440-09-7	Potassium	Potassium	No Value	No Value	4.00E+02	NA
7440-21-3	Silicon	Silicon	No Value	No Value	2.00E+00	NA
7440-23-5	Sodium	Sodium	No Value	No Value	5.00E+01	NA
TPHDIESEL	Total petroleum hydrocarbons - diesel range	Total petroleum hydrocarbons - diesel range	No Value	5.0E+02	---	NA
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	Total petroleum hydrocarbons - motor oil (high boiling)	No Value	5.0E+02	---	NA

1. All COPC screening values default to the estimated quantitation limit (EQL) when the calculated value is less than the EQL.
2. * indicates that C(VI) value set to a maximum value of 6.0 mg/kg because the K_d value used in the model was derived from experiments with soil concentrations less than 6.0 mg/kg.
3. "NR" indicates non-representative results when there is no breakthrough simulated within 1000 years for four or more of the five soil representative columns (where breakthrough is defined as concentrations exceeding 1.0E-04 µg/L).
4. "NA" indicates an applicable water quality standard is not available to calculate the SSL or PRG values.

CAS = Chemical Abstract Service

Table A1-2. Surface Water Screening Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Surface Water Protection (ml/g)	Surface Water Standard (µg/L)	EQL (mg/kg)	Surface Water Screening Values (mg/kg) [1,2,3,4]
						300 Area
16887-00-6	Chloride	chloride	0	2.3E+05	2.00E+00	6.96E+04
14797-55-8	Nitrate	Nitrate	0	4.5E+04	2.50E+00	1.36E+04
14797-65-0	Nitrite	Nitrite	0	No Value	2.50E+00	NA
NO3-N	Nitrogen in Nitrate	Nitrogen in Nitrate	0	1.0E+04	7.50E-01	3.03E+03
NO2-N	Nitrogen in Nitrite	Nitrogen in Nitrite	0	No Value	7.50E-01	NA
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	Nitrogen in Nitrite and Nitrate	0	1.0E+04	---	3.03E+03
14808-79-8	Sulfate	sulfate	0	No Value	5.00E+00	NA
51-28-5	2,4-Dinitrophenol	dinitrophenol;2,4-	0.00001	6.9E+01	8.25E-01	2.09E+01
67-64-1	Acetone	Acetone	0.0006	7.4E+05	2.00E-02	2.28E+05
107-21-1	Ethylene Glychol	Ethylene Glychol	0.001	1,640,000	---	NR
111-76-2	2-Butoxyethanol	Ethylene Glychol Mono Butyl Ether	0.001	82044	---	2.58E+04
75-99-0	Dalapon	Dalapon	0.0027	10773	---	3.55E+03
111-91-1	Bis(2-Chloroethoxy)methane	bis(2-chloroethoxyl)methane	0.00277	2.3E+03	3.30E-01	7.74E+02
78-93-3	2-Butanone	methyl ethyl ketone (MEK; 2-butanone)	0.00451	4.9E+05	1.00E-02	1.71E+05
74-87-3	Chloromethane	chloromethane	0.006	No Value	1.00E-02	NA
74-83-9	Bromomethane	bromomethane	0.009	4.7E+01	1.00E-02	1.90E+01
60-29-7	Diethylether	Diethylether	0.009699	96000	---	3.98E+04
75-09-2	Methylene chloride	methylene chloride	0.01	4.6E+00	5.00E-03	1.93E+00
108-10-1	4-Methyl-2-pentanone	methyl isobutyl ketone	0.0126	6.1E+04	1.00E-02	2.72E+04
591-78-6	2-Hexanone	HEXANONE;2-[MBK, methyl butyl ketone]	0.01498	3.4E+03	2.00E-02	1.62E+03
75-01-4	Vinyl chloride	vinyl chloride [chloroethene; 1-]	0.019	2.5E-02	5.00E-03	1.31E-02
75-00-3	Chloroethane	ethyl chloride	0.0217	No Value	1.00E-02	NA
621-64-7	n-Nitrosodi-n-dipropylamine	nitroso-di-n-propylamine;N-	0.024	5.0E-03	3.30E-01	3.30E-01
10061-01-5	cis-1,3-Dichloropropene	dichloropropene;1,2-,cis	0.027	3.4E-01	5.00E-03	2.05E-01
10061-02-6	trans-1,3-Dichloropropene	dichloropropene;1,3-,trans	0.027	3.4E-01	5.00E-03	2.05E-01
108-95-2	Phenol	Phenol	0.0288	1.0E+04	3.30E-01	6.21E+03
94-75-7	2,4-D	2,4-Dichlorophenoxyacetic acid	0.029	100	---	6.24E+01
1918-00-9	Dicamba	Dicamba	0.029	24613	---	1.53E+04
131-11-3	Dimethyl phthalate	dimethyl phthalate	0.0316	2.7E+05	3.30E-01	1.76E+05
156-59-2	cis-1,2-Dichloroethylene	dichloroethylene;1,2-,cis	0.036	2.3E+03	5.00E-03	1.66E+03
107-06-2	1,2-Dichloroethane	dichloroethane;1,2-	0.038	3.8E-01	5.00E-03	2.82E-01
156-60-5	trans-1,2-Dichloroethylene	dichloroethylene;1,2-,trans	0.038	1.4E+02	5.00E-03	1.04E+02
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	4-Amino-3,5,6-trichloropicolinic acid	0.039	57431	---	4.35E+04
108-60-1	Bis(2-chloro-1-methylethyl)ether	bis(2-chloro-1-methyl-ethyl)ether	0.0392	3.7E+01	3.30E-01	2.85E+01
540-59-0	1,2-Dichloroethene (Total)	dichloroethylene,1,2- (mixed isomers)	0.0396	2.1E+03	5.00E-03	1.61E+03
75-69-4	Trichloromonofluoromethane	Trichloromonofluoromethane	0.04389	35800	---	2.90E+04
75-15-0	Carbon disulfide	carbon disulfide	0.046	1.3E+04	5.00E-03	1.11E+04
78-59-1	Isophorone	isophorone	0.0468	8.4E+00	3.30E-01	7.07E+00
78-87-5	1,2-Dichloropropane	dichloropropane;1,2-	0.047	5.0E-01	5.00E-03	4.22E-01

Table A1-2. Surface Water Screening Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Surface Water Protection (ml/g)	Surface Water Standard (µg/L)	EQL (mg/kg)	Surface Water Screening Values (mg/kg) [1,2,3,4]
						300 Area
93-76-5	2,4,5-T	2,4,5-Trichlorophenoxyacetic acid	0.049	No Value	---	NA
99-09-2	3-Nitroaniline	nitroaniline, 3-	0.0516	1.0E+02	3.30E-01	9.22E+01
100-01-6	4-Nitroaniline	nitroaniline, 4-	0.0516	8.1E+01	3.30E-01	7.26E+01
88-74-4	2-Nitroaniline	nitroaniline, 2-	0.0527	2.6E+03	3.30E-01	2.36E+03
75-34-3	1,1-Dichloroethane	dichloroethane;1,1-	0.053	7.4E+04	1.00E-02	6.72E+04
67-66-3	Chloroform	chloroform	0.053	5.7E+00	5.00E-03	5.21E+00
75-27-4	Bromodichloromethane	bromodichloromethane	0.055	2.7E-01	5.00E-03	2.54E-01
71-43-2	Benzene	Benzene	0.062	1.2E+00	5.00E-03	1.24E+00
124-48-1	Dibromochloromethane	chlorodibromomethane [dibromochloromethane]	0.063	4.0E-01	5.00E-03	4.16E-01
75-35-4	1,1-Dichloroethene	Dichloroethene;1,1-	0.065	5.7E-02	1.00E-02	6.05E-02
606-20-2	2,6-Dinitrotoluene	dinitrotoluene;2,6-	0.0692	1.2E+02	3.30E-01	1.31E+02
106-47-8	4-Chloroaniline	chloroaniline;p-	0.0725	4.6E+00	3.30E-01	5.33E+00
79-00-5	1,1,2-Trichloroethane	trichloroethane;1,1,2-	0.075	5.9E-01	5.00E-03	6.95E-01
111-44-4	Bis(2-chloroethyl) ether	bis(2-chloroethyl)ether	0.076	3.0E-02	3.30E-01	3.30E-01
79-34-5	1,1,2,2-Tetrachloroethane	tetrachloroethane;1,1,2,2-	0.079	1.7E-01	5.00E-03	2.10E-01
93-72-1	2,4,5-TP	(2-(2,4,5-Trichlorophenoxy)propionic acid)Silvex	0.08	10	---	1.25E+01
84-66-2	Diethylphthalate	diethyl phthalate	0.082	1.7E+04	3.30E-01	2.16E+04
79-01-6	Trichloroethene	trichloroethylene (TCE)	0.094	2.5E+00	5.00E-03	3.51E+00
121-14-2	2,4-Dinitrotoluene	dinitrotoluene;2,4-	0.0955	1.1E-01	3.30E-01	3.30E-01
94-82-6	2,4-DB	(4-(2,4-Dichlorophenoxy)butanoic acid)	0.1	6564	---	9.74E+03
98-95-3	Nitrobenzene	Nitrobenzene	0.119	1.7E+01	3.30E-01	2.76E+01
75-25-2	Bromoform	bromoform	0.13	4.3E+00	5.00E-03	7.36E+00
71-55-6	1,1,1-Trichloroethane	Trichloroethane;1,1,1-	0.14	9.3E+05	5.00E-03	NR
108-88-3	Toluene	Toluene	0.14	1.3E+03	5.00E-03	2.35E+03
120-83-2	2,4-Dichlorophenol	dichlorophenol;2,4-	0.147	7.7E+01	3.30E-01	1.44E+02
56-23-5	Carbon tetrachloride	carbon tetrachloride	0.152	2.3E-01	5.00E-03	4.44E-01
100-41-4	Ethylbenzene	ethylbenzene	0.2	1.6E+01	5.00E-03	4.19E+01
108-38-3	m-Xylene	Xylene, m-	0.2	No Value	---	NA
105-67-9	2,4-Dimethylphenol	dimethylphenol;2,4-	0.209	3.8E+02	3.30E-01	1.04E+03
108-90-7	Chlorobenzene	chlorobenzene	0.22	1.3E+02	5.00E-03	3.70E+02
1330-20-7	Xylenes (total)	Xylenes (total)	0.23	No Value	1.00E-02	NA
95-47-6	o-Xylene	xylene,o-	0.24	No Value	---	NA
127-18-4	Tetrachloroethene	tetrachloroethylene	0.27	3.9E-01	5.00E-03	1.32E+00
88-75-5	2-Nitrophenol	nitrophenol;2-	0.297	No Value	6.60E-01	NA
100-02-7	4-Nitrophenol	nitrophenol;4-	0.309	4.0E+03	6.60E-01	1.59E+04
95-50-1	1,2-Dichlorobenzene	dichlorobenzene;1,2- (ortho-Dichlorobenzene)	0.379	4.2E+02	3.30E-01	1.99E+03
88-06-2	2,4,6-Trichlorophenol	Trichlorophenol2,4,6-	0.381	1.4E+00	3.30E-01	6.66E+00
95-57-8	2-Chlorophenol	Chlorophenol;2-	0.388	8.1E+01	3.30E-01	3.94E+02
541-73-1	1,3-Dichlorobenzene	dichlorobenzene;1,3	0.434	3.2E+02	3.30E-01	1.72E+03
95-48-7	2-Methylphenol (cresol, o-)	cresol;o-	0.434	1.2E+04	3.30E-01	6.53E+04

Table A1-2. Surface Water Screening Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Surface Water Protection (ml/g)	Surface Water Standard (µg/L)	EQL (mg/kg)	Surface Water Screening Values (mg/kg) [1,2,3,4]
						300 Area
106-44-5	4-Methylphenol (cresol, p-)	cresol;p-	0.434	1.5E+03	---	7.90E+03
59-50-7	4-Chloro-3-methylphenol	chloro-3-methylphenol;4-	0.4918	3.1E+04	3.30E-01	1.87E+05
87-86-5	Pentachlorophenol	pentachlorophenol	0.592	2.7E-01	3.30E-01	1.98E+00
534-52-1	4,6-Dinitro-2-methylphenol	dinitro-2-methylphenol;4,6-	0.6015	1.3E+01	3.30E-01	9.70E+01
106-46-7	1,4-Dichlorobenzene	dichlorobenzene;1,4- (para-Dichlorobenzene)	0.616	2.2E+01	5.00E-03	1.65E+02
91-94-1	3,3'-Dichlorobenzidine	dichlorobenzidine;3,3'-	0.724	2.1E-02	3.30E-01	3.30E-01
18540-29-9	Hexavalent Chromium	chromium(VI)	0.8	1.0E+01	---	6*
100-42-5	Styrene	styrene	0.91	3.8E+04	5.00E-03	NR
91-20-3	Naphthalene	naphthalene	1.19	4.9E+03	1.00E-01	6.97E+04
86-30-6	n-Nitrosodiphenylamine	nitrosodiphenylamine;N-	1.29	3.3E+00	3.30E-01	4.93E+01
58-89-9	Gamma-BHC (Lindane)	lindane [gamma-BHC] (see hexachlorocyclohexane)	1.35	1.9E-02	1.65E-03	2.94E-01
84-74-2	Di-n-butylphthalate	di-butyl phthalate	1.57	2.0E+03	3.30E-01	3.56E+04
95-95-4	2,4,5-Trichlorophenol	Trichlorophenol;2,4,5-	1.6	4.9E+02	3.30E-01	8.85E+03
120-82-1	1,2,4-Trichlorobenzene	trichlorobenzene;1,2,4-	1.66	2.0E+00	3.30E-01	3.72E+01
319-84-6	Alpha-BHC	hexachlorocyclohexane;alpha (alpha-BHC, HCH)	1.76	2.6E-03	1.65E-03	5.33E-02
67-72-1	Hexachloroethane	hexachloroethane	1.78	1.4E+00	3.30E-01	2.92E+01
126-73-8	Tributyl phosphate	Tributyl phosphate	1.89	24.3	---	5.56E+02
959-98-8	Endosulfan I	Endosulfan I	2.04	5.6E-02	1.65E-03	1.43E+00
33213-65-9	Endosulfan II	Endosulfan II	2.04	5.6E-02	3.30E-03	1.43E+00
1031-07-8	Endosulfan sulfate	Endosulfan sulfate	2.04	9.3E-01	3.30E-03	2.38E+01
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	hexachlorocyclohexane;beta-	2.14	9.1E-03	1.65E-03	2.39E-01
319-86-8	Delta-BHC	hexachlorocyclohexane;delta-	2.81	No Value	1.65E-03	NA
91-58-7	2-Chloronaphthalene	beta-chloronaphthalene	2.98	1.0E+03	3.30E-01	3.35E+04
91-57-6	2-Methylnaphthalene	methylnapthalene;2-	2.98	1.4E+02	3.30E-01	4.65E+03
7440-42-8	Boron	Boron	3	No Value	2.00E+00	NA
7005-72-3	4-Chlorophenylphenyl ether	chlorodiphenyl ether;4-	3.08	No Value	3.30E-01	NA
86-74-8	Carbazole	carbazole	3.39	No Value	3.30E-01	NA
7723-14-0	Phosphorus	phosphorus	3.5	No Value	5.00E+01	NA
88-85-7	Dinoseb	2-secButyl-4,6-dinitrophenol	3.5	No Value	---	NA
7440-36-0	Antimony	antimony	3.76	5.6E+00	6.00E-01	2.52E+02
7782-49-2	Selenium	selenium and compounds	5	5.0E+00	1.00E+00	3.02E+02
208-96-8	Acenaphthylene	acenaphthylene (Not in CLARC database tables; use acenaphthene as surrogate)	5.03	No Value	1.00E-01	NA
83-32-9	Acenaphthene	acenaphthene	6.12	6.4E+02	1.00E-01	4.94E+04
86-73-7	Fluorene	fluorene	7.71	1.1E+03	3.00E-02	1.06E+05
76-44-8	Heptachlor	heptachlor	9.53	7.9E-05	1.65E-03	9.71E-03
53494-70-5	Endrin ketone	Endrin ketone	9.72	No Value	3.30E-03	NA

Table A1-2. Surface Water Screening Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Surface Water Protection (ml/g)	Surface Water Standard (µg/L)	EQL (mg/kg)	Surface Water Screening Values (mg/kg) [1,2,3,4]
						300 Area
57-12-5	Cyanide	cyanide	9.9	5.2E+00	---	6.61E+02
11104-28-2	Aroclor-1221	aroclor 1221 [PCB]	10.3	6.4E-05	1.65E-02	1.65E-02
11141-16-5	Aroclor-1232	aroclor 1232 [PCB]	10.3	6.4E-05	1.65E-02	1.65E-02
72-20-8	Endrin	endrin	10.8	2.3E-03	3.30E-03	3.18E-01
7421-93-4	Endrin aldehyde	Endrin aldehyde	10.8	2.9E-01	3.30E-03	4.01E+01
132-64-9	Dibenzofuran	dibenzofuran	11.3	1.7E+00	3.30E-01	2.47E+02
85-68-7	Butylbenzylphthalate	butyl benzyl phthalate	13.8	8.2E+00	3.30E-01	1.50E+03
85-01-8	Phenanthrene	Phenanthrene	16.7	No Value	5.00E-02	NA
7439-98-7	Molybdenum	molybdenum	20	1.3E+03	2.00E+00	NR
7440-50-8	Copper	copper	22	9.0E+00	1.00E+00	3.40E+03
120-12-7	Anthracene	anthracene	23.5	8.3E+03	5.00E-02	NR
7440-39-3	Barium	Barium	25	1.0E+03	5.00E-01	NR
7439-89-6	Iron	Iron	25	3.0E+02	5.00E+00	1.43E+05
7440-24-6	Strontium	strontium	25	2.6E+04	1.00E+00	NR
60-57-1	Dieldrin	dieldrin	25.6	5.2E-05	3.30E-03	2.60E-02
7440-38-2	Arsenic	arsenic, inorganic	29	1.8E-02	1.00E+00	1.17E+01
7440-43-9	Cadmium	cadmium	30	2.5E-01	2.00E-01	1.76E+02
7439-92-1	Lead	lead	30	2.1E+00	5.00E-01	1.48E+03
7439-97-6	Mercury	mercury	30	1.2E-02	---	8.45E+00
7440-66-6	Zinc	zinc	30	9.1E+01	1.00E+00	6.41E+04
12672-29-6	Aroclor-1248	aroclor 1248 [PCB]	43.9	6.4E-05	1.65E-02	1.33E-01
53469-21-9	Aroclor-1242	aroclor 1242 [PCB]	44.8	6.4E-05	1.65E-02	1.43E-01
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	ddd	45.8	3.1E-04	3.30E-03	7.49E-01
309-00-2	Aldrin	aldrin	48.7	4.9E-05	1.65E-03	1.48E-01
206-44-0	Fluoranthene	fluoranthene	49.1	9.0E+01	5.00E-02	2.82E+05
7440-48-4	Cobalt	Cobalt	50	2.6E+00	2.00E+00	NR
7439-93-2	Lithium	Lithium	50	No Value	2.50E+00	NA
7439-96-5	Manganese	manganese	50	5.0E+01	5.00E+00	NR
5103-71-9	Alpha-Chlordane	Alpha-Chlordane	51	5.7E-04	1.65E-02	NR
57-74-9	Chlordane	chlordane	51	5.7E-04	1.65E-02	NR
87-68-3	Hexachlorobutadiene	hexachlorobutadiene	53.7	4.4E-01	3.30E-01	NR
7440-02-0	Nickel	nickel soluble salts	65	5.2E+01	4.00E+00	NR
129-00-0	Pyrene	pyrene	68	8.3E+02	5.00E-02	NR
7440-28-0	Thallium	Thallium, soluable salts	71	2.4E-01	5.00E-01	NR
11097-69-1	Aroclor-1254	aroclor 1254 (PCB)	75.6	6.4E-05	1.65E-02	NR
118-74-1	Hexachlorobenzene	hexachlorobenzene	80	2.8E-04	3.30E-01	NR
72-43-5	Methoxychlor	methoxychlor	80	3.0E-02	1.65E-02	NR
1024-57-3	Heptachlor epoxide	Heptachlor epoxide	83.2	3.9E-05	1.65E-03	NR
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	dde	86.4	2.2E-04	3.30E-03	NR
7440-22-4	Silver	silver	90	2.6E+00	2.00E-01	NR
8001-35-2	Toxaphene	toxaphene	95.8	2.0E-04	1.65E-01	NR
12674-11-2	Aroclor-1016	aroclor 1016 (PCB)	107	6.4E-05	1.65E-02	NR
117-81-7	Bis(2-ethylhexyl) phthalate	bis(2-ethylhexyl) phthalate	110	1.2E+00	3.30E-01	NR
7440-31-5	Tin	tin	130	5.2E+02	1.00E+01	NR
16984-48-8	Fluoride	fluoride (using fluorine)	150	1.6E+04	5.00E+00	NR
7440-47-3	Chromium	chromium (total)	200	6.5E+01	2.00E-01	NR

Table A1-2. Surface Water Screening Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Surface Water Protection (ml/g)	Surface Water Standard (µg/L)	EQL (mg/kg)	Surface Water Screening Values (mg/kg) [1,2,3,4]
						300 Area
218-01-9	Chrysene	Chrysene	200	2.8E-03	1.00E-01	NR
77-47-4	Hexachlorocyclopentadiene	hexachlorocyclopentadiene	200	4.0E+01	3.30E-01	NR
56-55-3	Benzo(a)anthracene	Benzo(a)anthracene	360	2.8E-03	1.50E-02	NR
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	ddt	678	2.2E-04	3.30E-03	NR
7440-41-7	Beryllium	beryllium	790	2.7E+02	2.00E-01	NR
205-99-2	Benzo(b)fluoranthene	Benzo(b)fluoranthene	803	2.8E-03	1.50E-02	NR
11096-82-5	Aroclor-1260	aroclor 1260 (PCB)	822	6.4E-05	1.65E-02	NR
7440-62-2	Vanadium	vanadium	1000	No Value	2.50E+00	NA
207-08-9	Benzo(k)fluoranthene	Benzo(k)fluoranthene	1230	2.8E-03	1.50E-02	NR
7429-90-5	Aluminum	Aluminum (soluble)	1500	8.7E+01	5.00E+00	NR
53-70-3	Dibenz[a,h]anthracene	Dibenz[a,h]anthracene	1790	2.8E-03	3.00E-02	NR
191-24-2	Benzo(ghi)perylene	BENZO(g,h,i)PERYLENE (using pyrene as a surrogate)	1950	No Value	3.00E-02	NA
193-39-5	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	3470	2.8E-03	3.00E-02	NR
50-32-8	Benzo(a)pyrene	Benzo(a)pyrene	5500	2.8E-03	1.50E-02	NR
117-84-0	Di-n-octylphthalate	di-n-octyl phthalate	83000	No Value	3.30E-01	NA
65794-96-9	3+4 Methylphenol (cresol, m+p)	methylphenol,3+4 (cresol, m+p)	No Value	No Value	3.30E-01	NA
101-55-3	4-Bromophenylphenyl ether	bromodiphenyl ether;4-	No Value	No Value	3.30E-01	NA
7440-69-9	Bismuth	Bismuth	No Value	No Value	1.00E+01	NA
24959-67-9	Bromide	Bromide	No Value	No Value	2.50E+00	NA
7440-70-2	Calcium	Calcium	No Value	No Value	1.00E+02	NA
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	Co-elution of Aroclor 1242 and Aroclor 1017	No Value	No Value	---	NA
7439-95-4	Magnesium	Magnesium (Not in CLARC database Tables)	No Value	No Value	7.50E+01	NA
14265-44-2	Phosphate	Phosphate	No Value	No Value	5.00E+00	NA
PO4-P	Phosphorus in phosphate	Phosphorus in phosphate	No Value	No Value	---	NA
7440-09-7	Potassium	Potassium	No Value	No Value	4.00E+02	NA
7440-21-3	Silicon	Silicon	No Value	No Value	2.00E+00	NA
7440-21-3	Silicon	Silicon	No Value	No Value	2.00E+00	NA
7440-23-5	Sodium	Sodium	No Value	No Value	5.00E+01	NA
TPHDIESEL	Total petroleum hydrocarbons - diesel range	Total petroleum hydrocarbons - diesel range	No Value	No Value	---	NA
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	Total petroleum hydrocarbons - motor oil (high boiling)	No Value	No Value	---	NA

1. All COPC screening values default to the estimated quantitation limit (EQL) when the calculated value is less than the EQL.
2. * indicates that C(VI) value set to a maximum value of 6.0 mg/kg because the K_d value used in the model was derived from experiments with soil concentrations less than 6.0 mg/kg.
3. "NR" indicates non-representative results when there is no breakthrough simulated within 1000 years for four or more of the five soil representative columns (where breakthrough is defined as concentrations exceeding 1.0E-04 µg/L).
4. "NA" indicates an applicable water quality standard is not available to calculate the SSL or PRG values.

CAS = Chemical Abstract Service

Table A1-3. Groundwater Screening Values for Radionuclides

Radionuclide Contaminant of Potential Concern	300 Area K_d Value used to Calculate Groundwater Protection (ml/g)	Maximum Contaminant Level (pCi/L)	Half-life (yr)	EQL (mg/kg)	Groundwater Screening Values (pCi/g) [1,2,3]
					300 Area
Carbon-14d	0	2000	5.7300E+03	---	6.06E+02
Technetium-99	0	900	2.1300E+05	---	2.72E+02
Tritium	0	20000	1.2350E+01	---	9.18E+03
Iodine-129	1	1	1.5700E+07	---	1.28E+01
Neptunium-237	15	15	2.1400E+06	---	3.04E+03
Strontium-90	25	8	2.9120E+01	---	2.27E+05
Nickel-63	30	50	9.6000E+01	---	3.17E+05
Cesium-137	50	200	3.0000E+01	1.0000E-01	NR
Cobalt-60	50	100	5.7210E+00	5.0000E-02	NR
Am-241	200	15	4.32E+02	1.00E+00	NR
C-14e	200	2,000	5.73E+03	---	NR
Cm-243	200	15	2.85E+01	---	NR
Eu-152	200	200	1.33E+01	1.00E-01	NR
Eu-154	200	60	8.80E+00	1.00E-01	NR
Eu-155	200	600	4.96E+00	1.00E-01	NR
Nb-94	200	No Value	2.03E+04	---	NA
Pu-238	200	15	8.77E+01	1.00E+00	NR
Pu-239	200	15	2.41E+04	1.00E+00	NR
Pu-240	200	15	6.54E+03	1.00E+00	NR
Pu-241	200	300	1.40E+01	---	NR
Ra-226	200	5	1.60E+03	---	NR
Ra-228	200	5	5.75E+00	2.00E-01	NR
Th-228	200	15	1.91E+00	---	NR
Th-230	200	15	7.70E+04	---	NR
Th-232	200	15	1.41E+10	---	NR

1. All COPC screening values default to the estimated quantitation limit (EQL) when the calculated value is less than the EQL.
2. "NR" indicates non-representative results where there is no breakthrough simulated within 1000 years for at least four of the five soil columns (where breakthrough is defined as concentrations above 1.0E-04 pCi/L).
3. "NA" indicates an applicable water quality standard is not available to calculate the SSL or PRG values.

Attachment A-2

Preliminary Remediation Goal (PRG) Values for 300 Area for Native Vegetation and Industrial Recharge Scenarios

Table A2-1. Groundwater Preliminary Remediation Goal (PRG) Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Groundwater Protection (ml/g)	Groundwater Standard (µg/L)	EQL (mg/kg)	Groundwater PRG Values (mg/kg) [1,2,3,4]	
						Native Vegetation Recharge Scenario	Industrial Recharge Scenario
16887-00-6	Chloride	chloride	0	2.5E+05	2.00E+00	1.13E+05	1.17E+05
14797-55-8	Nitrate	Nitrate	0	4.5E+04	2.50E+00	2.03E+04	2.10E+04
14797-65-0	Nitrite	Nitrite	0	3.3E+03	2.50E+00	1.49E+03	1.54E+03
NO3-N	Nitrogen in Nitrate	Nitrogen in Nitrate	0	1.0E+04	7.50E-01	4.51E+03	4.67E+03
NO2-N	Nitrogen in Nitrite	Nitrogen in Nitrite	0	1.0E+03	7.50E-01	4.51E+02	4.67E+02
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	Nitrogen in Nitrite and Nitrate	0	1.0E+04	---	4.51E+03	4.67E+03
14808-79-8	Sulfate	sulfate	0	2.5E+05	5.00E+00	1.13E+05	1.17E+05
51-28-5	2,4-Dinitrophenol	dinitrophenol;2,4-	0.00001	3.2E+01	8.25E-01	1.44E+01	1.50E+01
67-64-1	Acetone	Acetone	0.0006	7.2E+03	2.00E-02	3.32E+03	3.44E+03
107-21-1	Ethylene Glychol	Ethylene Glychol	0.001	16,000	---	7.50E+03	7.77E+03
111-76-2	2-Butoxyethanol	Ethylene Glychol Mono Butyl Ether	0.001	800	---	3.75E+02	3.88E+02
75-99-0	Dalapon	Dalapon	0.0027	200	---	9.85E+01	1.02E+02
111-91-1	Bis(2-Chloroethoxy)methane	bis(2-chloroethoxyl)methane	0.00277	4.8E+01	3.30E-01	2.37E+01	2.46E+01
78-93-3	2-Butanone	methyl ethyl ketone (MEK; 2-butanone)	0.00451	4.8E+03	1.00E-02	2.50E+03	2.59E+03
74-87-3	Chloromethane	chloromethane	0.006	No Value	1.00E-02	NA	NA
74-83-9	Bromomethane	bromomethane	0.009	1.1E+01	1.00E-02	6.82E+00	7.06E+00
60-29-7	Diethylether	Diethylether	0.009699	1600	---	1.00E+03	1.04E+03
75-09-2	Methylene chloride	methylene chloride	0.01	5.0E+00	5.00E-03	3.16E+00	3.27E+00
108-10-1	4-Methyl-2-pentanone	methyl isobutyl ketone	0.0126	6.4E+02	1.00E-02	4.30E+02	4.45E+02
591-78-6	2-Hexanone	HEXANONE;2- [MBK, methyl butyl ketone]	0.01498	4.0E+01	2.00E-02	2.85E+01	2.95E+01
75-01-4	Vinyl chloride	vinyl chloride [chloroethene; 1-]	0.019	6.1E-02	5.00E-03	4.84E-02	5.00E-02
75-00-3	Chloroethane	ethyl chloride	0.0217	No Value	1.00E-02	NA	NA
621-64-7	n-Nitrosodi-n-dipropylamine	nitroso-di-n-propylamine;N-	0.024	1.3E-02	3.30E-01	3.30E-01	3.30E-01
10061-01-5	cis-1,3-Dichloropropene	dichloropropene;1,2-,cis	0.027	4.4E-01	5.00E-03	4.05E-01	4.18E-01
10061-02-6	trans-1,3-Dichloropropene	dichloropropene;1,3-,trans	0.027	4.4E-01	5.00E-03	4.05E-01	4.18E-01
108-95-2	Phenol	Phenol	0.0288	2.4E+03	3.30E-01	2.30E+03	2.37E+03
94-75-7	2,4-D	2,4-Dichlorophenoxyacetic acid	0.029	70	---	6.72E+01	6.94E+01
1918-00-9	Dicamba	Dicamba	0.029	480	---	4.61E+02	4.76E+02
131-11-3	Dimethyl phthalate	dimethyl phthalate	0.0316	No Value	3.30E-01	NA	NA
156-59-2	cis-1,2-Dichloroethylene	dichloroethylene;1,2-,cis	0.036	7.0E+01	5.00E-03	7.76E+01	8.00E+01
107-06-2	1,2-Dichloroethane	dichloroethane;1,2-	0.038	4.8E-01	5.00E-03	5.58E-01	5.75E-01
156-60-5	trans-1,2-Dichloroethylene	dichloroethylene;1,2-,trans	0.038	1.0E+02	5.00E-03	1.16E+02	1.20E+02
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	4-Amino-3,5,6-trichloropicolinic acid	0.039	500	---	5.94E+02	6.12E+02
108-60-1	Bis(2-chloro-1-methylethyl)ether	bis(2-chloro-1-methyl-ethyl)ether	0.0392	6.3E-01	3.30E-01	7.46E-01	7.68E-01
540-59-0	1,2-Dichloroethene (Total)	dichloroethylene,1,2-(mixed isomers)	0.0396	7.2E+01	5.00E-03	8.67E+01	8.93E+01
75-69-4	Trichloromonofluoromethane	Trichloromonofluoromethane	0.04389	2400	---	3.07E+03	3.16E+03
75-15-0	Carbon disulfide	carbon disulfide	0.046	8.0E+02	5.00E-03	1.06E+03	1.09E+03
78-59-1	Isophorone	isophorone	0.0468	4.6E+01	3.30E-01	6.15E+01	6.32E+01
78-87-5	1,2-Dichloropropane	dichloropropane;1,2-	0.047	1.2E+00	5.00E-03	1.63E+00	1.67E+00

Table A2-1. Groundwater Preliminary Remediation Goal (PRG) Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Groundwater Protection (ml/g)	Groundwater Standard (µg/L)	EQL (mg/kg)	Groundwater PRG Values (mg/kg) [1,2,3,4]	
						Native Vegetation Recharge Scenario	Industrial Recharge Scenario
93-76-5	2,4,5-T	2,4,5-Trichlorophenoxyacetic acid	0.049	160	---	2.21E+02	2.27E+02
99-09-2	3-Nitroaniline	nitroaniline, 3-	0.0516	4.2E+00	3.30E-01	5.97E+00	6.13E+00
100-01-6	4-Nitroaniline	nitroaniline, 4-	0.0516	4.4E+00	3.30E-01	6.27E+00	6.44E+00
88-74-4	2-Nitroaniline	nitroaniline, 2-	0.0527	1.6E+02	3.30E-01	2.33E+02	2.39E+02
75-34-3	1,1-Dichloroethane	dichloroethane;1,1-	0.053	1.6E+03	1.00E-02	2.34E+03	2.41E+03
67-66-3	Chloroform	chloroform	0.053	1.4E+00	5.00E-03	2.07E+00	2.12E+00
75-27-4	Bromodichloromethane	bromodichloromethane	0.055	7.1E-01	5.00E-03	1.07E+00	1.09E+00
71-43-2	Benzene	Benzene	0.062	8.0E-01	5.00E-03	1.34E+00	1.37E+00
124-48-1	Dibromochloromethane	chlorodibromomethane [dibromochloromethane]	0.063	5.2E-01	5.00E-03	8.88E-01	9.08E-01
75-35-4	1,1-Dichloroethene	Dichloroethene;1,1-	0.065	7.0E+00	1.00E-02	1.22E+01	1.25E+01
606-20-2	2,6-Dinitrotoluene	dinitrotoluene;2,6-	0.0692	1.6E+01	3.30E-01	2.94E+01	3.00E+01
106-47-8	4-Chloroaniline	chloroaniline;p-	0.0725	2.2E-01	3.30E-01	4.19E-01	4.27E-01
79-00-5	1,1,2-Trichloroethane	trichloroethane;1,1,2-	0.075	7.7E-01	5.00E-03	1.52E+00	1.55E+00
111-44-4	Bis(2-chloroethyl) ether	bis(2-chloroethyl)ether	0.076	4.0E-02	3.30E-01	3.30E-01	3.30E-01
79-34-5	1,1,2,2-Tetrachloroethane	tetrachloroethane;1,1,2,2-	0.079	2.2E-01	5.00E-03	4.58E-01	4.65E-01
93-72-1	2,4,5-TP	(2-(2,4,5-Trichlorophenoxy)propionic acid)Silvex	0.08	50	---	1.06E+02	1.08E+02
84-66-2	Diethylphthalate	diethyl phthalate	0.082	1.3E+04	3.30E-01	2.77E+04	2.81E+04
79-01-6	Trichloroethene	trichloroethylene (TCE)	0.094	4.9E-01	5.00E-03	1.21E+00	1.22E+00
121-14-2	2,4-Dinitrotoluene	dinitrotoluene;2,4-	0.0955	2.8E-01	3.30E-01	7.08E-01	7.15E-01
94-82-6	2,4-DB	(4-(2,4-Dichlorophenoxy)butanoic acid)	0.1	128	---	3.39E+02	3.41E+02
98-95-3	Nitrobenzene	Nitrobenzene	0.119	1.6E+01	3.30E-01	4.76E+01	4.77E+01
75-25-2	Bromoform	bromoform	0.13	5.5E+00	5.00E-03	1.78E+01	1.77E+01
71-55-6	1,1,1-Trichloroethane	Trichloroethane;1,1,1-	0.14	2.0E+02	5.00E-03	6.90E+02	6.86E+02
108-88-3	Toluene	Toluene	0.14	6.4E+02	5.00E-03	2.21E+03	2.19E+03
120-83-2	2,4-Dichlorophenol	dichlorophenol;2,4-	0.147	2.4E+01	3.30E-01	8.75E+01	8.66E+01
56-23-5	Carbon tetrachloride	carbon tetrachloride	0.152	3.4E-01	5.00E-03	1.28E+00	1.26E+00
100-41-4	Ethylbenzene	ethylbenzene	0.2	4.0E+00	5.00E-03	2.51E+01	2.39E+01
108-38-3	m-Xylene	Xylene, m-	0.2	1.6E+03	---	1.01E+04	9.60E+03
105-67-9	2,4-Dimethylphenol	dimethylphenol;2,4-	0.209	1.6E+02	3.30E-01	1.06E+03	1.00E+03
108-90-7	Chlorobenzene	chlorobenzene	0.22	1.0E+02	5.00E-03	6.99E+02	6.59E+02
1330-20-7	Xylenes (total)	Xylenes (total)	0.23	1.6E+03	1.00E-02	1.18E+04	1.11E+04
95-47-6	o-Xylene	xylene,o-	0.24	1.6E+03	---	1.25E+04	1.17E+04
127-18-4	Tetrachloroethene	tetrachloroethylene	0.27	8.1E-02	5.00E-03	7.74E-01	7.09E-01
88-75-5	2-Nitrophenol	nitrophenol;2-	0.297	No Value	6.60E-01	NA	NA
100-02-7	4-Nitrophenol	nitrophenol;4-	0.309	1.3E+02	6.60E-01	1.63E+03	1.43E+03
95-50-1	1,2-Dichlorobenzene	dichlorobenzene;1,2-(ortho-Dichlorobenzene)	0.379	6.0E+02	3.30E-01	1.10E+04	8.50E+03
88-06-2	2,4,6-Trichlorophenol	Trichlorophenol2,4,6-	0.381	4.0E+00	3.30E-01	7.35E+01	5.67E+01
95-57-8	2-Chlorophenol	Chlorophenol;2-	0.388	4.0E+01	3.30E-01	7.73E+02	5.86E+02
541-73-1	1,3-Dichlorobenzene	dichlorobenzene;1,3	0.434	No Value	3.30E-01	NA	NA
95-48-7	2-Methylphenol (cresol, o-)	cresol;o-	0.434	4.0E+02	3.30E-01	9.60E+03	6.58E+03

Table A2-1. Groundwater Preliminary Remediation Goal (PRG) Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Groundwater Protection (ml/g)	Groundwater Standard (µg/L)	EQL (mg/kg)	Groundwater PRG Values (mg/kg) [1,2,3,4]	
						Native Vegetation Recharge Scenario	Industrial Recharge Scenario
106-44-5	4-Methylphenol (cresol, p-)	cresol;p-	0.434	4.0E+01	---	9.60E+02	6.58E+02
59-50-7	4-Chloro-3-methylphenol	chloro-3-methylphenol;4-	0.4918	1.6E+03	3.30E-01	5.08E+04	2.98E+04
87-86-5	Pentachlorophenol	pentachlorophenol	0.592	7.3E-01	3.30E-01	3.48E+01	1.62E+01
534-52-1	4,6-Dinitro-2-methylphenol	dinitro-2-methylphenol;4,6-	0.6015	1.3E+00	3.30E-01	6.38E+01	2.90E+01
106-46-7	1,4-Dichlorobenzene	dichlorobenzene;1,4- (para-Dichlorobenzene)	0.616	8.1E+00	5.00E-03	4.22E+02	1.87E+02
91-94-1	3,3'-Dichlorobenzidine	dichlorobenzidine;3,3'-	0.724	1.9E-01	3.30E-01	1.47E+01	5.25E+00
18540-29-9	Hexavalent Chromium	chromium(VI)	0.8	4.8E+01	---	6*	6*
100-42-5	Styrene	styrene	0.91	1.0E+02	5.00E-03	1.33E+04	3.38E+03
91-20-3	Naphthalene	naphthalene	1.19	1.6E+02	1.00E-01	NR	7.03E+03
86-30-6	n-Nitrosodiphenylamine	nitrosodiphenylamine;N-	1.29	1.8E+01	3.30E-01	NR	8.49E+02
58-89-9	Gamma-BHC (Lindane)	lindane [gamma-BHC] (see hexachlorocyclohexane)	1.35	8.0E-02	1.65E-03	NR	3.95E+00
84-74-2	Di-n-butylphthalate	di-butyl phthalate	1.57	1.6E+03	3.30E-01	NR	9.23E+04
95-95-4	2,4,5-Trichlorophenol	Trichlorophenol;2,4,5-	1.6	8.0E+02	3.30E-01	NR	4.70E+04
120-82-1	1,2,4-Trichlorobenzene	trichlorobenzene;1,2,4-	1.66	1.5E+00	3.30E-01	NR	9.19E+01
319-84-6	Alpha-BHC	hexachlorocyclohexane;alpha (alpha-BHC, HCH)	1.76	1.4E-02	1.65E-03	NR	8.96E-01
67-72-1	Hexachloroethane	hexachloroethane	1.78	3.1E+00	3.30E-01	NR	2.04E+02
126-73-8	Tributyl phosphate	Tributyl phosphate	1.89	9.51	---	NR	6.58E+02
959-98-8	Endosulfan I	Endosulfan I	2.04	9.6E+01	1.65E-03	NR	7.16E+03
33213-65-9	Endosulfan II	Endosulfan II	2.04	9.6E+01	3.30E-03	NR	7.16E+03
1031-07-8	Endosulfan sulfate	Endosulfan sulfate	2.04	No Value	3.30E-03	NA	NA
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	hexachlorocyclohexane;beta-	2.14	4.9E-02	1.65E-03	NR	3.73E+00
319-86-8	Delta-BHC	hexachlorocyclohexane;delta-	2.81	No Value	1.65E-03	NA	NA
91-58-7	2-Chloronaphthalene	beta-chloronaphthalene	2.98	6.4E+02	3.30E-01	NR	6.44E+04
91-57-6	2-Methylnaphthalene	methylnapthalene;2-	2.98	3.2E+01	3.30E-01	NR	3.22E+03
7440-42-8	Boron	Boron	3	3.2E+03	2.00E+00	NR	3.25E+05
7005-72-3	4-Chlorophenylphenyl ether	chlorodiphenyl ether;4-	3.08	No Value	3.30E-01	NA	NA
86-74-8	Carbazole	carbazole	3.39	4.4E+00	3.30E-01	NR	5.11E+02
7723-14-0	Phosphorus	phosphorus	3.5	1.6E-01	5.00E+01	NR	5.00E+01
88-85-7	Dinoseb	2-secButyl-4,6-dinitrophenol	3.5	7	---	NR	8.53E+02
7440-36-0	Antimony	antimony	3.76	6.0E+00	6.00E-01	NR	8.15E+02
7782-49-2	Selenium	selenium and compounds	5	5.0E+01	1.00E+00	NR	9.12E+03
208-96-8	Acenaphthylene	acenaphthylene (Not in CLARC database tables; use acenaphthene as surrogate)	5.03	No Value	1.00E-01	NA	NA
83-32-9	Acenaphthene	acenaphthene	6.12	9.6E+02	1.00E-01	NR	2.22E+05
86-73-7	Fluorene	fluorene	7.71	6.4E+02	3.00E-02	NR	2.02E+05
76-44-8	Heptachlor	heptachlor	9.53	1.9E-02	1.65E-03	NR	7.40E+00
53494-70-5	Endrin ketone	Endrin ketone	9.72	No Value	3.30E-03	NA	NA
57-12-5	Cyanide	cyanide	9.9	2.0E+02	---	NR	7.85E+04
11104-28-2	Aroclor-1221	aroclor 1221 [PCB]	10.3	4.4E-02	1.65E-02	NR	1.78E+01

Table A2-1. Groundwater Preliminary Remediation Goal (PRG) Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Groundwater Protection (ml/g)	Groundwater Standard (µg/L)	EQL (mg/kg)	Groundwater PRG Values (mg/kg) [1,2,3,4]	
						Native Vegetation Recharge Scenario	Industrial Recharge Scenario
11141-16-5	Aroclor-1232	aroclor 1232 [PCB]	10.3	4.4E-02	1.65E-02	NR	1.78E+01
72-20-8	Endrin	endrin	10.8	2.0E+00	3.30E-03	NR	8.49E+02
7421-93-4	Endrin aldehyde	Endrin aldehyde	10.8	No Value	3.30E-03	NA	NA
132-64-9	Dibenzofuran	dibenzofuran	11.3	1.6E+01	3.30E-01	NR	7.11E+03
85-68-7	Butylbenzylphthalate	butyl benzyl phthalate	13.8	4.6E+01	3.30E-01	NR	2.68E+04
85-01-8	Phenanthrene	Phenanthrene	16.7	No Value	5.00E-02	NA	NA
7439-98-7	Molybdenum	molybdenum	20	8.0E+01	2.00E+00	NR	NR
7440-50-8	Copper	copper	22	6.4E+02	1.00E+00	NR	NR
120-12-7	Anthracene	anthracene	23.5	4.8E+03	5.00E-02	NR	NR
7440-39-3	Barium	Barium	25	2.0E+03	5.00E-01	NR	NR
7439-89-6	Iron	Iron	25	3.0E+02	5.00E+00	NR	NR
7440-24-6	Strontium	strontium	25	9.6E+03	1.00E+00	NR	NR
60-57-1	Dieldrin	dieldrin	25.6	5.5E-03	3.30E-03	NR	NR
7440-38-2	Arsenic	arsenic, inorganic	29	5.8E-02	1.00E+00	NR	NR
7440-43-9	Cadmium	cadmium	30	5.0E+00	2.00E-01	NR	NR
7439-92-1	Lead	lead	30	1.5E+01	5.00E-01	NR	NR
7439-97-6	Mercury	mercury	30	2.0E+00	---	NR	NR
7440-66-6	Zinc	zinc	30	4.8E+03	1.00E+00	NR	NR
12672-29-6	Aroclor-1248	aroclor 1248 [PCB]	43.9	4.4E-02	1.65E-02	NR	NR
53469-21-9	Aroclor-1242	aroclor 1242 [PCB]	44.8	4.4E-02	1.65E-02	NR	NR
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	ddd	45.8	3.6E-01	3.30E-03	NR	NR
309-00-2	Aldrin	aldrin	48.7	2.6E-03	1.65E-03	NR	NR
206-44-0	Fluoranthene	fluoranthene	49.1	6.4E+02	5.00E-02	NR	NR
7440-48-4	Cobalt	Cobalt	50	4.8E+00	2.00E+00	NR	NR
7439-93-2	Lithium	Lithium	50	3.2E+01	2.50E+00	NR	NR
7439-96-5	Manganese	manganese	50	5.0E+01	5.00E+00	NR	NR
5103-71-9	Alpha-Chlordane	Alpha-Chlordane	51	2.5E-01	1.65E-02	NR	NR
57-74-9	Chlordane	chlordane	51	2.5E-01	1.65E-02	NR	NR
87-68-3	Hexachlorobutadiene	hexachlorobutadiene	53.7	5.6E-01	3.30E-01	NR	NR
7440-02-0	Nickel	nickel soluble salts	65	1.0E+02	4.00E+00	NR	NR
129-00-0	Pyrene	pyrene	68	4.8E+02	5.00E-02	NR	NR
7440-28-0	Thallium	Thallium, soluable salts	71	5.0E-01	5.00E-01	NR	NR
11097-69-1	Aroclor-1254	aroclor 1254 (PCB)	75.6	4.4E-02	1.65E-02	NR	NR
118-74-1	Hexachlorobenzene	hexachlorobenzene	80	5.5E-02	3.30E-01	NR	NR
72-43-5	Methoxychlor	methoxychlor	80	4.0E+01	1.65E-02	NR	NR
1024-57-3	Heptachlor epoxide	Heptachlor epoxide	83.2	4.8E-03	1.65E-03	NR	NR
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	dde	86.4	2.6E-01	3.30E-03	NR	NR
7440-22-4	Silver	silver	90	8.0E+01	2.00E-01	NR	NR
8001-35-2	Toxaphene	toxaphene	95.8	8.0E-02	1.65E-01	NR	NR
12674-11-2	Aroclor-1016	aroclor 1016 (PCB)	107	5.0E-01	1.65E-02	NR	NR
117-81-7	Bis(2-ethylhexyl) phthalate	bis(2-ethylhexyl) phthalate	110	6.0E+00	3.30E-01	NR	NR
7440-31-5	Tin	tin	130	9.6E+03	1.00E+01	NR	NR
16984-48-8	Fluoride	fluoride (using fluorine)	150	9.6E+02	5.00E+00	NR	NR
7440-47-3	Chromium	chromium (total)	200	1.0E+02	2.00E-01	NR	NR
218-01-9	Chrysene	Chrysene	200	1.2E+00	1.00E-01	NR	NR

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CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Groundwater Protection (ml/g)	Groundwater Standard (µg/L)	EQL (mg/kg)	Groundwater PRG Values (mg/kg) [1,2,3,4]	
						Native Vegetation Recharge Scenario	Industrial Recharge Scenario
77-47-4	Hexachlorocyclopentadiene	hexachlorocyclopentadiene	200	4.8E+01	3.30E-01	NR	NR
56-55-3	Benzo(a)anthracene	Benzo(a)anthracene	360	1.2E-01	1.50E-02	NR	NR
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	ddt	678	2.6E-01	3.30E-03	NR	NR
7440-41-7	Beryllium	beryllium	790	4.0E+00	2.00E-01	NR	NR
205-99-2	Benzo(b)fluoranthene	Benzo(b)fluoranthene	803	1.2E-01	1.50E-02	NR	NR
11096-82-5	Aroclor-1260	aroclor 1260 (PCB)	822	4.4E-02	1.65E-02	NR	NR
7440-62-2	Vanadium	vanadium	1000	8.0E+01	2.50E+00	NR	NR
207-08-9	Benzo(k)fluoranthene	Benzo(k)fluoranthene	1230	1.2E-01	1.50E-02	NR	NR
7429-90-5	Aluminum	Aluminum (soluble)	1500	5.0E+01	5.00E+00	NR	NR
53-70-3	Dibenz[a,h]anthracene	Dibenz[a,h]anthracene	1790	1.2E-01	3.00E-02	NR	NR
191-24-2	Benzo(ghi)perylene	BENZO(g,h,i)PERYLENE (using pyrene as a surrogate)	1950	No Value	3.00E-02	NA	NA
193-39-5	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	3470	1.2E-01	3.00E-02	NR	NR
50-32-8	Benzo(a)pyrene	Benzo(a)pyrene	5500	1.2E-02	1.50E-02	NR	NR
117-84-0	Di-n-octylphthalate	di-n-octyl phthalate	83000	No Value	3.30E-01	NA	NA
65794-96-9	3+4 Methylphenol (cresol, m+p)	methylphenol,3+4 (cresol, m+p)	No Value	No Value	3.30E-01	NA	NA
101-55-3	4-Bromophenylphenyl ether	bromodiphenyl ether;4-	No Value	No Value	3.30E-01	NA	NA
7440-69-9	Bismuth	Bismuth	No Value	No Value	1.00E+01	NA	NA
24959-67-9	Bromide	Bromide	No Value	No Value	2.50E+00	NA	NA
7440-70-2	Calcium	Calcium	No Value	No Value	1.00E+02	NA	NA
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	Co-elution of Aroclor 1242 and Aroclor 1017	No Value	No Value	---	NA	NA
7439-95-4	Magnesium	Magnesium (Not in CLARC database Tables)	No Value	No Value	7.50E+01	NA	NA
14265-44-2	Phosphate	Phosphate	No Value	No Value	5.00E+00	NA	NA
PO4-P	Phosphorus in phosphate	Phosphorus in phosphate	No Value	No Value	---	NA	NA
7440-09-7	Potassium	Potassium	No Value	No Value	4.00E+02	NA	NA
7440-21-3	Silicon	Silicon	No Value	No Value	2.00E+00	NA	NA
7440-23-5	Sodium	Sodium	No Value	No Value	5.00E+01	NA	NA
TPHDIESEL	Total petroleum hydrocarbons - diesel range	Total petroleum hydrocarbons - diesel range	No Value	5.0E+02	---	NA	NA
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	Total petroleum hydrocarbons - motor oil (high boiling)	No Value	5.0E+02	---	NA	NA

1. All COPC screening values default to the estimated quantitation limit (EQL) when the calculated value is less than the EQL.
2. * indicates that C(VI) value set to a maximum value of 6.0 mg/kg because the K_d value used in the model was derived from experiments with soil concentrations less than 6.0 mg/kg.
3. "NR" indicates non-representative results when there is no breakthrough simulated within 1000 years for four or more of the five soil representative columns (where breakthrough is defined as concentrations exceeding 1.0E-04 µg/L).
4. "NA" indicates an applicable water quality standard is not available to calculate the SSL or PRG values.

CAS = Chemical Abstract Service

Table A2-2. Surface Water Preliminary Remediation Goal (PRG) Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Surface Water Protection (ml/g)	Surface Water Standard (µg/L)	EQL (mg/kg)	Surface Water PRG Values (mg/kg) [1,2,3,4]	
						Native Vegetation Recharge Scenario	Industrial Recharge Scenario
16887-00-6	Chloride	chloride	0	2.3E+05	2.00E+00	1.04E+05	1.07E+05
14797-55-8	Nitrate	Nitrate	0	4.5E+04	2.50E+00	2.03E+04	2.10E+04
14797-65-0	Nitrite	Nitrite	0	No Value	2.50E+00	NA	NA
NO3-N	Nitrogen in Nitrate	Nitrogen in Nitrate	0	1.0E+04	7.50E-01	4.51E+03	4.67E+03
NO2-N	Nitrogen in Nitrite	Nitrogen in Nitrite	0	No Value	7.50E-01	NA	NA
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	Nitrogen in Nitrite and Nitrate	0	1.0E+04	---	4.51E+03	4.67E+03
14808-79-8	Sulfate	sulfate	0	No Value	5.00E+00	NA	NA
51-28-5	2,4-Dinitrophenol	dinitrophenol;2,4-	0.00001	6.9E+01	8.25E-01	3.11E+01	3.22E+01
67-64-1	Acetone	Acetone	0.0006	7.4E+05	2.00E-02	3.41E+05	3.53E+05
107-21-1	Ethylene Glychol	Ethylene Glychol	0.001	1,640,000	---	NR	NR
111-76-2	2-Butoxyethanol	Ethylene Glychol Mono Butyl Ether	0.001	82044	---	3.84E+04	3.98E+04
75-99-0	Dalapon	Dalapon	0.0027	10773	---	5.31E+03	5.50E+03
111-91-1	Bis(2-Chloroethoxy)methane	bis(2-chloroethoxyl)methane	0.00277	2.3E+03	3.30E-01	1.16E+03	1.20E+03
78-93-3	2-Butanone	methyl ethyl ketone (MEK; 2-butanone)	0.00451	4.9E+05	1.00E-02	2.57E+05	2.66E+05
74-87-3	Chloromethane	chloromethane	0.006	No Value	1.00E-02	NA	NA
74-83-9	Bromomethane	bromomethane	0.009	4.7E+01	1.00E-02	2.86E+01	2.96E+01
60-29-7	Diethylether	Diethylether	0.009699	96000	---	6.00E+04	6.21E+04
75-09-2	Methylene chloride	methylene chloride	0.01	4.6E+00	5.00E-03	2.91E+00	3.01E+00
108-10-1	4-Methyl-2-pentanone	methyl isobutyl ketone	0.0126	6.1E+04	1.00E-02	4.10E+04	4.25E+04
591-78-6	2-Hexanone	HEXANONE;2- [MBK, methyl butyl ketone]	0.01498	3.4E+03	2.00E-02	2.45E+03	2.53E+03
75-01-4	Vinyl chloride	vinyl chloride [chloroethene; 1-]	0.019	2.5E-02	5.00E-03	1.99E-02	2.06E-02
75-00-3	Chloroethane	ethyl chloride	0.0217	No Value	1.00E-02	NA	NA
621-64-7	n-Nitrosodi-n-dipropylamine	nitroso-di-n-propylamine;N-	0.024	5.0E-03	3.30E-01	3.30E-01	3.30E-01
10061-01-5	cis-1,3-Dichloropropene	dichloropropene;1,2-,cis	0.027	3.4E-01	5.00E-03	3.15E-01	3.25E-01
10061-02-6	trans-1,3-Dichloropropene	dichloropropene;1,3-,trans	0.027	3.4E-01	5.00E-03	3.15E-01	3.25E-01
108-95-2	Phenol	Phenol	0.0288	1.0E+04	3.30E-01	9.57E+03	9.88E+03
94-75-7	2,4-D	2,4-Dichlorophenoxyacetic acid	0.029	100	---	9.61E+01	9.92E+01
1918-00-9	Dicamba	Dicamba	0.029	24613	---	2.36E+04	2.44E+04
131-11-3	Dimethyl phthalate	dimethyl phthalate	0.0316	2.7E+05	3.30E-01	2.73E+05	2.82E+05
156-59-2	cis-1,2-Dichloroethylene	dichloroethylene;1,2-,cis	0.036	2.3E+03	5.00E-03	2.59E+03	2.67E+03
107-06-2	1,2-Dichloroethane	dichloroethane;1,2-	0.038	3.8E-01	5.00E-03	4.41E-01	4.54E-01
156-60-5	trans-1,2-Dichloroethylene	dichloroethylene;1,2-,trans	0.038	1.4E+02	5.00E-03	1.62E+02	1.67E+02
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	4-Amino-3,5,6-trichloropicolinic acid	0.039	57431	---	6.82E+04	7.02E+04
108-60-1	Bis(2-chloro-1-methylethyl)ether	bis(2-chloro-1-methyl-ethyl)ether	0.0392	3.7E+01	3.30E-01	4.47E+01	4.61E+01
540-59-0	1,2-Dichloroethene (Total)	dichloroethylene,1,2-(mixed isomers)	0.0396	2.1E+03	5.00E-03	2.53E+03	2.61E+03
75-69-4	Trichloromonofluoromethane	Trichloromonofluoromethane	0.04389	35800	---	4.59E+04	4.72E+04
75-15-0	Carbon disulfide	carbon disulfide	0.046	1.3E+04	5.00E-03	1.75E+04	1.80E+04
78-59-1	Isophorone	isophorone	0.0468	8.4E+00	3.30E-01	1.12E+01	1.15E+01
78-87-5	1,2-Dichloropropane	dichloropropane;1,2-	0.047	5.0E-01	5.00E-03	6.69E-01	6.88E-01

Table A2-2. Surface Water Preliminary Remediation Goal (PRG) Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Surface Water Protection (ml/g)	Surface Water Standard (µg/L)	EQL (mg/kg)	Surface Water PRG Values (mg/kg) [1,2,3,4]	
						Native Vegetation Recharge Scenario	Industrial Recharge Scenario
93-76-5	2,4,5-T	2,4,5-Trichlorophenoxyacetic acid	0.049	No Value	---	NA	NA
99-09-2	3-Nitroaniline	nitroaniline, 3-	0.0516	1.0E+02	3.30E-01	1.47E+02	1.51E+02
100-01-6	4-Nitroaniline	nitroaniline, 4-	0.0516	8.1E+01	3.30E-01	1.16E+02	1.19E+02
88-74-4	2-Nitroaniline	nitroaniline, 2-	0.0527	2.6E+03	3.30E-01	3.78E+03	3.88E+03
75-34-3	1,1-Dichloroethane	dichloroethane;1,1-	0.053	7.4E+04	1.00E-02	1.08E+05	1.11E+05
67-66-3	Chloroform	chloroform	0.053	5.7E+00	5.00E-03	8.35E+00	8.57E+00
75-27-4	Bromodichloromethane	bromodichloromethane	0.055	2.7E-01	5.00E-03	4.09E-01	4.19E-01
71-43-2	Benzene	Benzene	0.062	1.2E+00	5.00E-03	2.02E+00	2.07E+00
124-48-1	Dibromochloromethane	chlorodibromomethane [dibromochloromethane]	0.063	4.0E-01	5.00E-03	6.82E-01	6.97E-01
75-35-4	1,1-Dichloroethene	Dichloroethene;1,1-	0.065	5.7E-02	1.00E-02	9.95E-02	1.02E-01
606-20-2	2,6-Dinitrotoluene	dinitrotoluene;2,6-	0.0692	1.2E+02	3.30E-01	2.16E+02	2.21E+02
106-47-8	4-Chloroaniline	chloroaniline;p-	0.0725	4.6E+00	3.30E-01	8.89E+00	9.06E+00
79-00-5	1,1,2-Trichloroethane	trichloroethane;1,1,2-	0.075	5.9E-01	5.00E-03	1.17E+00	1.19E+00
111-44-4	Bis(2-chloroethyl) ether	bis(2-chloroethyl)ether	0.076	3.0E-02	3.30E-01	3.30E-01	3.30E-01
79-34-5	1,1,2,2-Tetrachloroethane	tetrachloroethane;1,1,2,2-	0.079	1.7E-01	5.00E-03	3.56E-01	3.61E-01
93-72-1	2,4,5-TP	(2-(2,4,5-Trichlorophenoxy)propionic acid)Silvex	0.08	10	---	2.12E+01	2.16E+01
84-66-2	Diethylphthalate	diethyl phthalate	0.082	1.7E+04	3.30E-01	3.68E+04	3.74E+04
79-01-6	Trichloroethene	trichloroethylene (TCE)	0.094	2.5E+00	5.00E-03	6.16E+00	6.22E+00
121-14-2	2,4-Dinitrotoluene	dinitrotoluene;2,4-	0.0955	1.1E-01	3.30E-01	3.30E-01	3.30E-01
94-82-6	2,4-DB	(4-(2,4-Dichlorophenoxy)butanoic acid)	0.1	6564	---	1.74E+04	1.75E+04
98-95-3	Nitrobenzene	Nitrobenzene	0.119	1.7E+01	3.30E-01	5.06E+01	5.07E+01
75-25-2	Bromoform	bromoform	0.13	4.3E+00	5.00E-03	1.38E+01	1.38E+01
71-55-6	1,1,1-Trichloroethane	Trichloroethane;1,1,1-	0.14	9.3E+05	5.00E-03	NR	NR
108-88-3	Toluene	Toluene	0.14	1.3E+03	5.00E-03	4.49E+03	4.46E+03
120-83-2	2,4-Dichlorophenol	dichlorophenol;2,4-	0.147	7.7E+01	3.30E-01	2.81E+02	2.78E+02
56-23-5	Carbon tetrachloride	carbon tetrachloride	0.152	2.3E-01	5.00E-03	8.73E-01	8.62E-01
100-41-4	Ethylbenzene	ethylbenzene	0.2	1.6E+01	5.00E-03	9.93E+01	9.42E+01
108-38-3	m-Xylene	Xylene, m-	0.2	No Value	---	NA	NA
105-67-9	2,4-Dimethylphenol	dimethylphenol;2,4-	0.209	3.8E+02	3.30E-01	2.51E+03	2.37E+03
108-90-7	Chlorobenzene	chlorobenzene	0.22	1.3E+02	5.00E-03	9.09E+02	8.57E+02
1330-20-7	Xylenes (total)	Xylenes (total)	0.23	No Value	1.00E-02	NA	NA
95-47-6	o-Xylene	xylene,o-	0.24	No Value	---	NA	NA
127-18-4	Tetrachloroethene	tetrachloroethylene	0.27	3.9E-01	5.00E-03	3.70E+00	3.39E+00
88-75-5	2-Nitrophenol	nitrophenol;2-	0.297	No Value	6.60E-01	NA	NA
100-02-7	4-Nitrophenol	nitrophenol;4-	0.309	4.0E+03	6.60E-01	5.13E+04	4.52E+04
95-50-1	1,2-Dichlorobenzene	dichlorobenzene;1,2-(ortho-Dichlorobenzene)	0.379	4.2E+02	3.30E-01	7.67E+03	5.95E+03
88-06-2	2,4,6-Trichlorophenol	Trichlorophenol2,4,6-	0.381	1.4E+00	3.30E-01	2.59E+01	2.00E+01
95-57-8	2-Chlorophenol	Chlorophenol;2-	0.388	8.1E+01	3.30E-01	1.57E+03	1.19E+03
541-73-1	1,3-Dichlorobenzene	dichlorobenzene;1,3	0.434	3.2E+02	3.30E-01	7.68E+03	5.26E+03
95-48-7	2-Methylphenol (cresol, o-)	cresol;o-	0.434	1.2E+04	3.30E-01	2.91E+05	1.99E+05

Table A2-2. Surface Water Preliminary Remediation Goal (PRG) Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Surface Water Protection (ml/g)	Surface Water Standard (µg/L)	EQL (mg/kg)	Surface Water PRG Values (mg/kg) [1,2,3,4]	
						Native Vegetation Recharge Scenario	Industrial Recharge Scenario
106-44-5	4-Methylphenol (cresol, p-)	cresol;p-	0.434	1.5E+03	---	3.52E+04	2.41E+04
59-50-7	4-Chloro-3-methylphenol	chloro-3-methylphenol;4-	0.4918	3.1E+04	3.30E-01	NR	NR
87-86-5	Pentachlorophenol	pentachlorophenol	0.592	2.7E-01	3.30E-01	1.29E+01	6.01E+00
534-52-1	4,6-Dinitro-2-methylphenol	dinitro-2-methylphenol;4,6-	0.6015	1.3E+01	3.30E-01	6.48E+02	2.95E+02
106-46-7	1,4-Dichlorobenzene	dichlorobenzene;1,4- (para-Dichlorobenzene)	0.616	2.2E+01	5.00E-03	1.12E+03	4.99E+02
91-94-1	3,3'-Dichlorobenzidine	dichlorobenzidine;3,3'-	0.724	2.1E-02	3.30E-01	1.59E+00	5.67E-01
18540-29-9	Hexavalent Chromium	chromium(VI)	0.8	1.0E+01	---	6*	6*
100-42-5	Styrene	styrene	0.91	3.8E+04	5.00E-03	NR	NR
91-20-3	Naphthalene	naphthalene	1.19	4.9E+03	1.00E-01	NR	2.17E+05
86-30-6	n-Nitrosodiphenylamine	nitrosodiphenylamine;N-	1.29	3.3E+00	3.30E-01	NR	1.57E+02
58-89-9	Gamma-BHC (Lindane)	lindane [gamma-BHC] (see hexachlorocyclohexane)	1.35	1.9E-02	1.65E-03	NR	9.45E-01
84-74-2	Di-n-butylphthalate	di-butyl phthalate	1.57	2.0E+03	3.30E-01	NR	1.15E+05
95-95-4	2,4,5-Trichlorophenol	Trichlorophenol;2,4,5-	1.6	4.9E+02	3.30E-01	NR	2.86E+04
120-82-1	1,2,4-Trichlorobenzene	trichlorobenzene;1,2,4-	1.66	2.0E+00	3.30E-01	NR	1.19E+02
319-84-6	Alpha-BHC	hexachlorocyclohexane;alpha (alpha-BHC, HCH)	1.76	2.6E-03	1.65E-03	NR	1.68E-01
67-72-1	Hexachloroethane	hexachloroethane	1.78	1.4E+00	3.30E-01	NR	9.14E+01
126-73-8	Tributyl phosphate	Tributyl phosphate	1.89	24.3	---	NR	1.68E+03
959-98-8	Endosulfan I	Endosulfan I	2.04	5.6E-02	1.65E-03	NR	4.17E+00
33213-65-9	Endosulfan II	Endosulfan II	2.04	5.6E-02	3.30E-03	NR	4.17E+00
1031-07-8	Endosulfan sulfate	Endosulfan sulfate	2.04	9.3E-01	3.30E-03	NR	6.93E+01
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	hexachlorocyclohexane;beta-	2.14	9.1E-03	1.65E-03	NR	6.98E-01
319-86-8	Delta-BHC	hexachlorocyclohexane;delta-	2.81	No Value	1.65E-03	NA	NA
91-58-7	2-Chloronaphthalene	beta-chloronaphthalene	2.98	1.0E+03	3.30E-01	NR	1.01E+05
91-57-6	2-Methylnaphthalene	methylnapthalene;2-	2.98	1.4E+02	3.30E-01	NR	1.40E+04
7440-42-8	Boron	Boron	3	No Value	2.00E+00	NA	NA
7005-72-3	4-Chlorophenylphenyl ether	chlorodiphenyl ether;4-	3.08	No Value	3.30E-01	NA	NA
86-74-8	Carbazole	carbazole	3.39	No Value	3.30E-01	NA	NA
7723-14-0	Phosphorus	phosphorus	3.5	No Value	5.00E+01	NA	NA
88-85-7	Dinoseb	2-secButyl-4,6-dinitrophenol	3.5	No Value	---	NA	NA
7440-36-0	Antimony	antimony	3.76	5.6E+00	6.00E-01	NR	7.60E+02
7782-49-2	Selenium	selenium and compounds	5	5.0E+00	1.00E+00	NR	9.12E+02
208-96-8	Acenaphthylene	acenaphthylene (Not in CLARC database tables; use acenaphthene as surrogate)	5.03	No Value	1.00E-01	NA	NA
83-32-9	Acenaphthene	acenaphthene	6.12	6.4E+02	1.00E-01	NR	1.49E+05
86-73-7	Fluorene	fluorene	7.71	1.1E+03	3.00E-02	NR	3.48E+05
76-44-8	Heptachlor	heptachlor	9.53	7.9E-05	1.65E-03	NR	3.01E-02
53494-70-5	Endrin ketone	Endrin ketone	9.72	No Value	3.30E-03	NA	NA
57-12-5	Cyanide	cyanide	9.9	5.2E+00	---	NR	2.04E+03
11104-28-2	Aroclor-1221	aroclor 1221 [PCB]	10.3	6.4E-05	1.65E-02	NR	2.60E-02

Table A2-2. Surface Water Preliminary Remediation Goal (PRG) Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Surface Water Protection (ml/g)	Surface Water Standard (µg/L)	EQL (mg/kg)	Surface Water PRG Values (mg/kg) [1,2,3,4]	
						Native Vegetation Recharge Scenario	Industrial Recharge Scenario
11141-16-5	Aroclor-1232	aroclor 1232 [PCB]	10.3	6.4E-05	1.65E-02	NR	2.60E-02
72-20-8	Endrin	endrin	10.8	2.3E-03	3.30E-03	NR	9.76E-01
7421-93-4	Endrin aldehyde	Endrin aldehyde	10.8	2.9E-01	3.30E-03	NR	1.23E+02
132-64-9	Dibenzofuran	dibenzofuran	11.3	1.7E+00	3.30E-01	NR	7.58E+02
85-68-7	Butylbenzylphthalate	butyl benzyl phthalate	13.8	8.2E+00	3.30E-01	NR	4.80E+03
85-01-8	Phenanthrene	Phenanthrene	16.7	No Value	5.00E-02	NA	NA
7439-98-7	Molybdenum	molybdenum	20	1.3E+03	2.00E+00	NR	NR
7440-50-8	Copper	copper	22	9.0E+00	1.00E+00	NR	NR
120-12-7	Anthracene	anthracene	23.5	8.3E+03	5.00E-02	NR	NR
7440-39-3	Barium	Barium	25	1.0E+03	5.00E-01	NR	NR
7439-89-6	Iron	Iron	25	3.0E+02	5.00E+00	NR	NR
7440-24-6	Strontium	strontium	25	2.6E+04	1.00E+00	NR	NR
60-57-1	Dieldrin	dieldrin	25.6	5.2E-05	3.30E-03	NR	NR
7440-38-2	Arsenic	arsenic, inorganic	29	1.8E-02	1.00E+00	NR	NR
7440-43-9	Cadmium	cadmium	30	2.5E-01	2.00E-01	NR	NR
7439-92-1	Lead	lead	30	2.1E+00	5.00E-01	NR	NR
7439-97-6	Mercury	mercury	30	1.2E-02	---	NR	NR
7440-66-6	Zinc	zinc	30	9.1E+01	1.00E+00	NR	NR
12672-29-6	Aroclor-1248	aroclor 1248 [PCB]	43.9	6.4E-05	1.65E-02	NR	NR
53469-21-9	Aroclor-1242	aroclor 1242 [PCB]	44.8	6.4E-05	1.65E-02	NR	NR
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	ddd	45.8	3.1E-04	3.30E-03	NR	NR
309-00-2	Aldrin	aldrin	48.7	4.9E-05	1.65E-03	NR	NR
206-44-0	Fluoranthene	fluoranthene	49.1	9.0E+01	5.00E-02	NR	NR
7440-48-4	Cobalt	Cobalt	50	2.6E+00	2.00E+00	NR	NR
7439-93-2	Lithium	Lithium	50	No Value	2.50E+00	NA	NA
7439-96-5	Manganese	manganese	50	5.0E+01	5.00E+00	NR	NR
5103-71-9	Alpha-Chlordane	Alpha-Chlordane	51	5.7E-04	1.65E-02	NR	NR
57-74-9	Chlordane	chlordane	51	5.7E-04	1.65E-02	NR	NR
87-68-3	Hexachlorobutadiene	hexachlorobutadiene	53.7	4.4E-01	3.30E-01	NR	NR
7440-02-0	Nickel	nickel soluble salts	65	5.2E+01	4.00E+00	NR	NR
129-00-0	Pyrene	pyrene	68	8.3E+02	5.00E-02	NR	NR
7440-28-0	Thallium	Thallium, soluable salts	71	2.4E-01	5.00E-01	NR	NR
11097-69-1	Aroclor-1254	aroclor 1254 (PCB)	75.6	6.4E-05	1.65E-02	NR	NR
118-74-1	Hexachlorobenzene	hexachlorobenzene	80	2.8E-04	3.30E-01	NR	NR
72-43-5	Methoxychlor	methoxychlor	80	3.0E-02	1.65E-02	NR	NR
1024-57-3	Heptachlor epoxide	Heptachlor epoxide	83.2	3.9E-05	1.65E-03	NR	NR
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	dde	86.4	2.2E-04	3.30E-03	NR	NR
7440-22-4	Silver	silver	90	2.6E+00	2.00E-01	NR	NR
8001-35-2	Toxaphene	toxaphene	95.8	2.0E-04	1.65E-01	NR	NR
12674-11-2	Aroclor-1016	aroclor 1016 (PCB)	107	6.4E-05	1.65E-02	NR	NR
117-81-7	Bis(2-ethylhexyl) phthalate	bis(2-ethylhexyl) phthalate	110	1.2E+00	3.30E-01	NR	NR
7440-31-5	Tin	tin	130	5.2E+02	1.00E+01	NR	NR
16984-48-8	Fluoride	fluoride (using fluorine)	150	1.6E+04	5.00E+00	NR	NR
7440-47-3	Chromium	chromium (total)	200	6.5E+01	2.00E-01	NR	NR
218-01-9	Chrysene	Chrysene	200	2.8E-03	1.00E-01	NR	NR

Table A2-2. Surface Water Preliminary Remediation Goal (PRG) Values

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	300 Area K_d Value used to Calculate Surface Water Protection (ml/g)	Surface Water Standard (µg/L)	EQL (mg/kg)	Surface Water PRG Values (mg/kg) [1,2,3,4]	
						Native Vegetation Recharge Scenario	Industrial Recharge Scenario
77-47-4	Hexachlorocyclopentadiene	hexachlorocyclopentadiene	200	4.0E+01	3.30E-01	NR	NR
56-55-3	Benzo(a)anthracene	Benzo(a)anthracene	360	2.8E-03	1.50E-02	NR	NR
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	ddt	678	2.2E-04	3.30E-03	NR	NR
7440-41-7	Beryllium	beryllium	790	2.7E+02	2.00E-01	NR	NR
205-99-2	Benzo(b)fluoranthene	Benzo(b)fluoranthene	803	2.8E-03	1.50E-02	NR	NR
11096-82-5	Aroclor-1260	aroclor 1260 (PCB)	822	6.4E-05	1.65E-02	NR	NR
7440-62-2	Vanadium	vanadium	1000	No Value	2.50E+00	NA	NA
207-08-9	Benzo(k)fluoranthene	Benzo(k)fluoranthene	1230	2.8E-03	1.50E-02	NR	NR
7429-90-5	Aluminum	Aluminum (soluble)	1500	8.7E+01	5.00E+00	NR	NR
53-70-3	Dibenz[a,h]anthracene	Dibenz[a,h]anthracene	1790	2.8E-03	3.00E-02	NR	NR
191-24-2	Benzo(ghi)perylene	BENZO(g,h,i)PERYLENE (using pyrene as a surrogate)	1950	No Value	3.00E-02	NA	NA
193-39-5	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	3470	2.8E-03	3.00E-02	NR	NR
50-32-8	Benzo(a)pyrene	Benzo(a)pyrene	5500	2.8E-03	1.50E-02	NR	NR
117-84-0	Di-n-octylphthalate	di-n-octyl phthalate	83000	No Value	3.30E-01	NA	NA
65794-96-9	3+4 Methylphenol (cresol, m+p)	methylphenol,3+4 (cresol, m+p)	No Value	No Value	3.30E-01	NA	NA
101-55-3	4-Bromophenylphenyl ether	bromodiphenyl ether;4-	No Value	No Value	3.30E-01	NA	NA
7440-69-9	Bismuth	Bismuth	No Value	No Value	1.00E+01	NA	NA
24959-67-9	Bromide	Bromide	No Value	No Value	2.50E+00	NA	NA
7440-70-2	Calcium	Calcium	No Value	No Value	1.00E+02	NA	NA
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	Co-elution of Aroclor 1242 and Aroclor 1017	No Value	No Value	---	NA	NA
7439-95-4	Magnesium	Magnesium (Not in CLARC database Tables)	No Value	No Value	7.50E+01	NA	NA
14265-44-2	Phosphate	Phosphate	No Value	No Value	5.00E+00	NA	NA
PO4-P	Phosphorus in phosphate	Phosphorus in phosphate	No Value	No Value	---	NA	NA
7440-09-7	Potassium	Potassium	No Value	No Value	4.00E+02	NA	NA
7440-21-3	Silicon	Silicon	No Value	No Value	2.00E+00	NA	NA
7440-23-5	Sodium	Sodium	No Value	No Value	5.00E+01	NA	NA
TPHDIESEL	Total petroleum hydrocarbons - diesel range	Total petroleum hydrocarbons - diesel range	No Value	No Value	---	NA	NA
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	Total petroleum hydrocarbons - motor oil (high boiling)	No Value	No Value	---	NA	NA

1. All COPC screening values default to the estimated quantitation limit (EQL) when the calculated value is less than the EQL.
2. * indicates that Cr(VI) value set to a maximum value of 6.0 mg/kg because the K_d value used in the model was derived from experiments with soil concentrations less than 6.0 mg/kg.
3. "NR" indicates non-representative results when there is no breakthrough simulated within 1000 years for four or more of the five soil representative columns (where breakthrough is defined as concentrations exceeding 1.0E-04 µg/L).
4. "NA" indicates an applicable water quality standard is not available to calculate the SSL or PRG values.

CAS = Chemical Abstract Service

Table A2-3. Groundwater Preliminary Remediation Goal (PRG) Values for Radionuclides

Radionuclide Contaminant of Potential Concern	300 Area K_d Value used to Calculate Groundwater Protection (ml/g)	Maximum Contaminant Level (pCi/L)	Half-life (yr)	EQL (mg/kg)	Groundwater Screening Values (pCi/g) [1,2,3]	
					Native Vegetation Recharge Scenario	Industrial Recharge Scenario
Carbon-14d	0	2000	5.7300E+03	---	9.02E+02	9.35E+02
Technetium-99	0	900	2.1300E+05	---	4.05E+02	4.20E+02
Tritium	0	20000	1.2350E+01	---	1.17E+04	1.22E+04
Iodine-129	1	1	1.5700E+07	---	NR	3.71E+01
Uranium-235	2	No Value	7.0380E+08	5.0000E-01	NA	NA
Uranium-238	2	No Value	4.4680E+09	1.0000E+00	NA	NA
Neptunium-237	15	15	2.1400E+06	---	NR	9.77E+03
Strontium-90	25	8	2.9120E+01	---	NR	NR
Nickel-63	30	50	9.6000E+01	---	NR	NR
Cesium-137	50	200	3.0000E+01	1.0000E-01	NR	NR
Cobalt-60	50	100	5.7210E+00	5.0000E-02	NR	NR
Am-241	200	15	4.32E+02	1.00E+00	NR	NR
C-14e	200	2,000	5.73E+03	---	NR	NR
Cm-243	200	15	2.85E+01	---	NR	NR
Eu-152	200	200	1.33E+01	1.00E-01	NR	NR
Eu-154	200	60	8.80E+00	1.00E-01	NR	NR
Eu-155	200	600	4.96E+00	1.00E-01	NR	NR
Nb-94	200	No Value	2.03E+04	---	NA	NA
Pu-238	200	15	8.77E+01	1.00E+00	NR	NR
Pu-239	200	15	2.41E+04	1.00E+00	NR	NR
Pu-240	200	15	6.54E+03	1.00E+00	NR	NR
Pu-241	200	300	1.40E+01	---	NR	NR
Ra-226	200	5	1.60E+03	---	NR	NR
Ra-228	200	5	5.75E+00	2.00E-01	NR	NR
Th-228	200	15	1.91E+00	---	NR	NR
Th-230	200	15	7.70E+04	---	NR	NR
Th-232	200	15	1.41E+10	---	NR	NR

1. All COPC screening values default to the estimated quantitation limit (EQL) when the calculated value is less than the EQL.
2. "NR" indicates non-representative results where there is no breakthrough simulated within 1000 years for at least four of the five soil columns (where breakthrough is defined as concentrations above 1.0E-04 pCi/L).
3. "NA" indicates an applicable water quality standard is not available to calculate the SSL or PRG values.

Attachment B

Software Installation and Checkout Form for STOMP Build 2 on GREEN

CHPRC SOFTWARE INSTALLATION AND CHECKOUT FORM

Software Owner Instructions:
Complete Fields 1-13, then run test cases in Field 14. Compare test case results listed in Field 15 to corresponding Test Report outputs. If results are the same, sign and date Field 19. If not, resolve differences and repeat above steps.

Software Subject Matter Expert Instructions:
Assign test personnel. Approve the installation of the code by signing and dating Field 21, then maintain form as part of the software support documentation.

GENERAL INFORMATION:

1. Software Name: STOMP (Subsurface Transport Over Multiple Phases) Software Version No.: Build2

EXECUTABLE INFORMATION:

2. Executable Name (include path):

```
a51dc453e98a084b391c08ac2ac3a976  stomp-wae-bd-chprc02i.x
70fd1a594885ff9118d5802be8aaaa47  stomp-wae-cg-chprc02i.x
c2ddd7624276023bd4d3d0ef1817a40e  stomp-wae-cgs-chprc02i.x
21713e06e4676a0204d8292680911bdd  stomp-w-bd-chprc02i.x
7d712b548eea0326a6b3e5fd956ee61b  stomp-w-cg-chprc02i.x
32c15e8d89b508e78814ff091d2a49d0  stomp-w-cgs-chprc02i.x
6988abf48a371ec20ff652920f72d6c6  stomp-w-r-bd-chprc02i.x
```

3. Executable Size (bytes): MD5 signatures shown above uniquely identify executables

COMPILATION INFORMATION:

4. Hardware System (i.e., property number or ID):

RANSAC Linux Cluster (WD56054)

5. Operating System (include version number):

Redhat Enterprise Linux WS3 (Taroon Update)

INSTALLATION AND CHECKOUT INFORMATION:

6. Hardware System (i.e., property number or ID):

INTERA GREEN Linux File Server (INTERA-00469)

7. Operating System (include version number):

Linux green 2.6.32-30-server #59-Ubuntu SMP Tue Mar 1 22:46:09 UTC 2011 x86 64 GNU/Linux

8. Open Problem Report? (●) No ( ) Yes PR/CR No.

TEST CASE INFORMATION:

9. Directory/Path:

/srv/samba/saved data/test/stomp/build-02

10. Procedure(s):

CHPRC-00211 Rev. 1, STOMP Software Test Plan

11. Libraries:

N/A (static linking)

12. Input Files:

Input files for ATC-STOMP-1, ATC-STOMP-2, and ATC-STOMP-2

13. Output Files:

plot.* files produced by STOMP executables

14. Test Cases:

ATC-STOMP-1, ATC-STOMP-2, and ATC-STOMP-3

15. Test Case Results:

Page 1 of 2 A-6005-149 (REV 0)

CHPRC SOFTWARE INSTALLATION AND CHECKOUT FORM (continued)

1. Software Name: STOMP (Subsurface Transport Over Multiple Phases) Software Version No.: Build2

PASS (diff all plot files showed no numerical differences)

16. Test Performed By: WE Nichols

17. Test Results: (●) Satisfactory, Accepted for Use ( ) Unsatisfactory

18. Disposition (include HISI update):

Installation added to STOMP HISI Entry. This is a multiuser server; approved software users include T Clemo, J Ludwig, T Budge, N Hasan, A Mayenna, H Rashid, C Courbet, W Nichols, T Dale, S Mehta.

Prepared By: William E. Nichols
Digitally signed by William E. Nichols
DN: cn=William E. Nichols, o=CHPRC, ou=EPSP, email=william_e_nichols@rl.gov, c=US
Date: 2011.03.31 16:06:54 -07'00'

19.		
Software Owner (Signature)	Print	Date
	WE Nichols	

20. Test Personnel:

William E. Nichols (Digitally signed by William E. Nichols DN: cn=William E. Nichols, o=CHPRC, ou=EPSP, email=william_e_nichols@rl.gov, c=US Date: 2011.03.31 16:02:24 -07'00')	WE Nichols	
Sign	Print	Date
Sign	Print	Date
Sign	Print	Date

Approved By:

21.		
Software SME (Signature)	Print	Date
	N/R	

ECF-300NPL-11-0154
Revision 1

Comparison of the 300-FF-2 Source Operable Unit Exposure Point Concentrations to Soil Screening Levels Protective of Groundwater and Soil Screening Levels Protective of Surface Water

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

CH2MHILL
Plateau Remediation Company
P.O. Box 1600
Richland, Washington 99352

**Approved for Public Release;
Further Dissemination Unlimited**

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Revision 1

Comparison of the 300-FF-2 Source Operable Unit Exposure Point Concentrations to Soil Screening Levels Protective of Groundwater and Soil Screening Levels Protective of Surface Water

Document Type: ENV Program/Project: EP & SP

J. Hulstrom
INTERA

Date Published
October 2012

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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APPROVED
By Shauna E. Adams at 10:35 am, Nov 07, 2012

Release Approval Date

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CH2MHILL Plateau Remediation Company

Environmental Calculation Cover Page

Part 1: Completed by the Responsible Manager

Project: 100 Areas and 300 Area Remedial Investigation/Feasibility Study Reports **Date: October 22, 2012**

Calculation Title & Description: **Comparison of the 300-FF-2 Source Operable Unit Exposure Point Concentrations to Soil Screening Levels Protective of Groundwater and Soil Screening Levels Protective of Surface Water**

Preparer: Jason Hulstrom	**Basis of Qualification: Education and Experience**
Checker: Doug Evans	**Basis of Qualification: Education and Experience**
Senior Reviewer: Doug Evans	**Basis of Qualification: Education and Experience**

Part 2: Completed by Preparer

Calculation No.: ECF-300NPL-11-0154 **Revision No.: Rev. 1**

Revision History:

Revision No.	Description	Date	Affected Pages
Draft A	Incorporated revised SSLs for analytes other than total uranium and revised background values for gap analytes. Eliminated time-to-peak screening step.	10/14/2011	All
Rev. 0	Incorporated revised SSLs calculated with the STOMP 1D 70:30/100:0 contaminant source model from ECF-300FF5-0153 (Rev. 2). Eliminated comparisons to SSLs based on fixed parameter 3-phase model.	5/10/2012	All
Rev. 1	Incorporated comparisons to new uranium 2-D SSL values for GWP and SWP.	10/22/2012	All

Part 3: Document Review & Approval:

Preparer:

Jason Hulstrom/ Environmental Scientist

NAME/POSITION

Jason Hulstrom 10/23/12

SIGNATURE DATE

Checker:

Doug Evans/ Senior Risk Assessor

NAME/POSITION

Doug Evans 10/22/2012

SIGNATURE DATE

Senior Reviewer:

Doug Evans/ Senior Risk Assessor

NAME/POSITION

Doug Evans 10/22/2012

SIGNATURE DATE

CH2MHILL Plateau Remediation Company

Environmental Calculation Cover Page

Part 1: Completed by the Responsible Manager

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Preparer: Jason Hulstrom	**Basis of Qualification: Education and Experience**
Checker: Doug Evans	**Basis of Qualification: Education and Experience**
Senior Reviewer: Doug Evans	**Basis of Qualification: Education and Experience**

Part 2: Completed by Preparer

Calculation No.: ECF-300NPL-11-0154

Revision No.: Rev. 1

Responsible Manager: **Alaa Aly/Risk and Modeling Integration Manager**

NAME/POSITION

SIGNATURE

10/22/12

DATE

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6 Calculation **5**

7 Results/Conclusions **5**

8 References **5**

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Terms

CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC	contaminant of potential concern
DOE	U.S. Department of Energy
ECF	Environmental Calculation File
EPA	Environmental Protection Agency
EPC	Exposure point concentration
FS	Feasibility study
OU	Operable unit
RI	Remedial investigation
STOMP	Subsurface Transport Over Multiple Phases

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1 Purpose

This environmental calculation documents the methodology used to determine if current site conditions for the 300 Area based on post-remediation soil sample results exceed soil screening levels for the protection of groundwater and the protection of surface water. The 300 Area is associated with two source operable units (OUs): the 300-FF-1 OU and 300-FF-2 OU. These OUs are referred to collectively herein as the 300 Area Source OU. The exposure point concentrations (EPCs) for each waste site decision unit in the 300 Area Source OU are compared to soil screening levels to identify contaminants of potential concern (COPCs) for the protection of groundwater pathway and the protection of surface water pathway. This procedure is consistent with the guidance described in EPA 540/R-96/018, *Soil Screening Guidance: Users Guide.* The identified COPCs will be used to support the remedial investigation/feasibility study (RI/FS) process being conducted for the 100 Areas and 300 Area under the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA).

This environmental calculation supports DOE/RL-2010-99, *Remedial Investigation/Feasibility Study for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units*, under CERCLA. A summary based upon the comparison of EPCs to soil screening levels described in this environmental calculation will be presented in the RI/FS report.

2 Background

Based on agreements with the Senior Executive Council, modeling with the STOMP simulator (PNNL-15782, *STOMP Subsurface Transport Over Multiple Phases, Version 4: User's Guide*) was performed to provide a basis for estimating soil screening levels for groundwater protection and surface water protection. Soil screening levels for the protection of groundwater and the protection of surface water were estimated using the STOMP 1D 70:30/100:0 Contaminant Source Model, which is a one-dimensional model that assumes either 70 percent contamination of the vadose zone (upper 70 percent contaminated, lower 30 percent uncontaminated [70:30]) or 100 percent contamination of the vadose zone (zero percent uncontaminated [100:0]) beneath a backfilled waste site. Source distributions are assigned based on analyte distribution coefficients (K_d). A 70:30 source distribution is assumed for analytes with a $K_d \geq 2$ mL/g and a 100:0 source distribution is assumed for analytes with a $K_d < 2$ mL/g. As implemented for determination of soil screening levels, the STOMP 1D 70:30/100:0 Contaminant Source Model includes recharge from irrigation and assumes that all contamination moves downward with no dispersion, volatilization, or credit for mixing with river water.

Comparisons are first conducted between the analyte-specific soil screening levels and EPC values for each waste site decision unit. Comparisons are then conducted between the EPCs and Hanford Site soil background concentrations. Analytes with EPCs that exceed both the 90th percentile background concentration and a soil screening level are considered COPCs and are carried forward to the RI/FS report.

Due to the geochemical complexity of uranium in 300 Area Source OU soils, the uranium soil screening levels for the protection of groundwater and the protection of surface water were calculated from peak groundwater concentration of uranium simulated using the STOMP 2D Uranium Source Model. The STOMP 2D Uranium Source Model is a site-specific, two-dimensional model developed to simulate the fate and transport of uranium in the 300 Area vadose zone and unconfined groundwater aquifer. The 2D uranium model was used to calculate uranium soil screening levels using an irrigation recharge scenario. Other modeling conditions used for the 2D uranium model are described in ECF-300FF5-11-0151, *Groundwater Flow and Uranium Transport Modeling in Support of the 300 Area FF-5 RI/FS Document.*

3 Methodology

This section describes the methodology used to compare EPCs for each waste site decision unit to soil screening levels for groundwater protection and surface water protection.

For all detected analytes for the 300 Area waste site decision units, the following steps are performed:

1. Obtain soil screening levels for the protection of groundwater and the protection of surface water calculated using the STOMP 1D 70:30/100:0 Contaminant Source model and the STOMP 2D Uranium Source Model.
2. Obtain EPC values for each waste site decision unit within the 300 Area Source OU.
3. Individually compare EPCs for each waste site decision unit within the 300 Area Source OU to soil screening levels for the protection of groundwater and the protection of surface water.

The previous steps are conducted for all detected analytes in the 300 Area Source OU. The following steps are used to provide a list of analytes that also exceed applicable 90th percentile background concentrations.

4. Obtain 90th percentile background values.
5. Compare the EPC value to the applicable lognormal 90th percentile background value.
6. If the EPC is less than or equal to the lognormal 90th percentile background value, then no further comparison is made.
7. If the EPC is greater than the lognormal 90th percentile value, then a comparison to soil screening levels is made.
8. If a lognormal 90th percentile value is not available, then a comparison to soil screening levels is made.

Analytes that have EPCs that exceed both the 90th percentile soil background concentration and a soil screening level are considered COPCs and carried forward to the RI/FS report.

4 Assumptions and Inputs

Assumptions and inputs associated with soil screening levels, EPCs, and soil background concentrations are described below.

4.1 Soil Screening Levels

Table 4-1 documents the source of information for soil screening levels.

Table 4-1. Soil Screening Level References

Soil Screening Level	Pathway	Reference
Groundwater Flow and Uranium Transport Modeling	Groundwater	ECF-300FF5-11-0151
	Surface Water	ECF-300FF5-11-0151
STOMP 1D 70:30/100:0 Contaminant	Groundwater	ECF-300FF5-11-0153

Table 4-1. Soil Screening Level References

Soil Screening Level	Pathway	Reference
Source Model	Surface Water	ECF-300FF5-11-0153

Notes:

ECF-300FF5-11-0151, *Groundwater Flow and Uranium Transport Modeling in Support of the 300 Area FF-5 RI/FS Document*.

ECF-300FF5-11-0153, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for 300 Area Source Areas*

4.1.1 Soil Screening Levels Protective of Groundwater

Soil screening levels for the protection of groundwater at and near the 300 Area Source OU have been derived using the following model:

- STOMP 1D 70:30/100:0 Contaminant Source Model

With the exception of uranium, the STOMP 1D groundwater protective soil screening levels for all detected analytes in the 300 Area Source OU are provided in Table 4-2. The STOMP 1D 70:30/100:0 Contaminant Source Model as implemented for determination of soil screening levels uses an irrigation recharge scenario and assumes that either the upper 70 percent of the vadose zone is contaminated (for $K_d \geq 2$ mL/g analytes) or the entire vadose zone is contaminated (for $K_d < 2$ mL/g analytes) below clean fill. Operable unit-specific soil screening levels protective of groundwater for the 300 Area Source OU calculated using the STOMP 70:30/100:0 Contaminant Source Model are document in ECF-300FF5-11-0153, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for 300 Area Source Areas.*

4.1.2 Uranium Soil Screening Level for Protection of Groundwater

Due to the geochemical complexity of uranium transport in 300 Area Source OU soils, the uranium soil screening level for the protection of groundwater is calculated from peak groundwater concentration of uranium simulated using the STOMP 2D Uranium Source Model as documented in ECF-300FF5-11-0151, *Groundwater Flow and Uranium Transport Modeling in Support of the 300 Area FF-5 RI/FS Document*. The groundwater protective uranium soil screening level is calculated using an irrigation recharge scenario. The groundwater protective soil screening levels for uranium are presented in Table 4-2.

4.1.3 Soil Screening Levels Protective of Surface Water

Soil screening levels for the protection of surface water are used in the River Corridor RI/FS process because the operable units in this area abut surface water. Soil screening levels for the protection of surface water at and near the 300 Area Source OU have been derived using the following model:

- STOMP 1D 70:30/100:0 Contaminant Source Model

With the exception of uranium, the STOMP 1D surface water protective soil screening levels for all detected analytes in the 300 Area Source OU are provided in Table 4-3. The STOMP 1D 70:30/100:0 Contaminant Source Model as implemented for determination of soil screening levels uses an irrigation recharge scenario and assumes that either the upper 70 percent of the vadose zone is contaminated (for $K_d \geq 2$ mL/g analytes) or the entire vadose zone is contaminated (for $K_d < 2$ mL/g analytes) below clean fill. The model takes no credit for dilution of groundwater by mixing with surface water. Operable unit-

specific soil screening levels protective of surface water for the 300 Area Source OU calculated using the STOMP 1D 70:30/100:0 Contaminant Source Model are documented in ECF-300FF5-11-0153.

4.1.4 Uranium Soil Screening Level for Protection of Surface Water

Due to the geochemical complexity of uranium transport in 300 Area Source OU soils, the uranium soil screening level for the protection of surface water is calculated from peak groundwater concentration of uranium simulated using the STOMP 2D Uranium Source Model as documented in ECF-300FF5-11-0151. The surface water protective uranium soil screening level is calculated using an irrigation recharge scenario. The surface water protective soil screening levels for uranium are presented in Table 4-3.

4.2 Exposure Point Concentrations

OSWER 9285.6-10, *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites*, states that, "an exposure point concentration (EPC) is a conservative estimate of the average chemical concentration in an exposure medium." OSWER Publication 9285.7-081, *Supplemental Guidance to RAGS: Calculating the Concentration Term,* states that, "because of the uncertainty associated with estimating the true average concentration at a site, the 95 percent upper confidence limit (UCL) of the arithmetic mean should be used for this variable."

The EPCs used for comparison to soil screening levels are the analyte-specific values computed from the post-remediation soil sample results for each waste site decision unit in the 300 Area Source OU, as described in ECF-300NPL-11-0137, *Computation of Exposure Point Concentrations for the 300-FF-2 Source Operable Unit.* The EPCs for each waste site decision unit are presented in Table 4-4 for the 300 Area Source OU.

4.3 Hanford Site Background

EPA 540-R-01-003, *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites*, provides national policy considerations for application of background data in risk assessment and remedy selection. This policy recommends an approach that addresses site-specific background issues in the risk characterization. EPA 540-R-01-003 indicates the following:

> "COPCs that have both release-related and background-related sources should be included in the risk assessment. When concentrations of naturally occurring elements at a site exceed risk-based screening levels, that information should be discussed qualitatively in the risk characterization."

EPA 540-R-01-003 defines background constituents as the following: (1) *anthropogenic* - natural and human-made substances present in the environment as a result of human activities (not specifically related to the CERCLA release in question), and (2) *naturally occurring* - substances present in the environment in forms that have not been influenced by human activity.

Lognormal 90th percentile background values for the Hanford Site (representative of both naturally occurring and anthropogenic substances) have been developed for inorganic chemicals and identified in DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, Summary Table 2. Radionuclide background values are identified in DOE/RL-96-12, *Hanford Site Background: Part 2, Soil Background for Radionuclides*, Table 5-1. ECF-HANFORD-11-0038, *Soil Background Data for Interim Use at the Hanford Site*, reports lognormal 90th percentile background

values for most of the metals that are absent from DOE/RL-92-24. The analyte-specific background concentrations are presented in Table 4-5.

5 Software Applications

Microsoft Excel® was used to tabulate the data in electronic spreadsheets. These spreadsheets are provided as tables that accompany this environmental calculation.

6 Calculation

Contaminants of potential concern for groundwater protection and surface water protection at the 300 Area Source OU are identified by comparing EPCs to soil screening levels and background concentrations, as described in Section 3. Comparison results are provided in summary in Section 7 and in full in Appendix A. The comparison tables all share a similar format, providing both the values being compared as well as a "Yes/No" column indicating the outcome of the comparison.

7 Results/Conclusions

A summary of the 300 Area Source OU waste site decision unit EPCs that exceed soil screening levels for groundwater protection and surface water protection, *without consideration of soil background concentrations*, are presented in Tables 7-1 and 7-2, respectively.

A summary of the 300 Area Source OU waste site decision unit EPCs that exceed soil screening levels for groundwater protection and surface water protection, *as well as soil background concentrations*, are presented in Tables 7-3 and 7-4, respectively.

Analytes that have an EPC that exceeds both the 90th percentile background concentration as well as a soil screening level are considered COPCs to be carried forward for further analysis.

Detailed tables showing the full series of comparison steps carried out in producing the summary tables presented in Tables 7-1 through 7-4 are provided in Appendix A.

8 References

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Appendix A
Detailed Comparison Tables

The full series of comparison steps carried out in identifying COPCs for groundwater protection and surface water protection for the 300 Area Source OU are presented in the tables listed below.

Tables for the 300 Area Source Operable Unit EPC Comparison to Groundwater Protective Soil Screening Levels and Surface Water Protective Soil Screening Levels

300 Area Source Operable Unit
Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Soil Screening Levels Protective of Groundwater (Without Background Consideration)
Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)
Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values
Table A-4. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Model Soil Screening Levels Protective of Groundwater (With Background Consideration)
Table A-5. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Table 4-2. Summary of Groundwater Protective Soil Screening Levels for the 300 Area Source Operable Unit

Analyte	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection (pCi/g, µg/kg)[c]
Radionuclides				
Americium-241	14596-10-2	200	1.0	--[d]
Cesium-137	10045-97-3	50	0.10	--[d]
Cobalt-60	10198-40-0	50	0.050	--[d]
Europium-155	14391-16-3	200	0.10	--[d]
Plutonium-238	13981-16-3	200	1.0	--[d]
Plutonium-239/240	PU-239/240	200	1.0	--[d]
Plutonium-241	14119-32-5	200	1.0	--[d]
Total beta radiostrontium	SR-RAD	25	--	227,428
Tritium	10028-17-8	0	--	9,176
Uranium-233/234	U-233/234	2.0	1.0	--[e]
Uranium-235	15117-96-1	2.0	0.50	--[e]
Uranium-238	U-238	2.0	1.0	--[e]
Nonradionuclides				
1,1,2,2-Tetrachloroethane	79-34-5	0.079	0.0050	270
1,2,4-Trichlorobenzene	120-82-1	1.7	0.33	28,655
1,4-Dichlorobenzene	106-46-7	0.62	0.0050	61,744
2,4-Dinitrotoluene	121-14-2	0.096	0.33	402
2-Butanone	78-93-3	0.0045	0.010	1.67E+06
2-Butoxyethanol	111-76-2	0.0010	--	251,308
2-Chlorophenol	95-57-8	0.39	0.33	194,372
2-Methylnaphthalene	91-57-6	3.0	0.33	1.07E+06
4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	86	0.0033	--[d]
4-Chloro-3-methylphenol	59-50-7	0.49	0.33	9.78E+06
Acenaphthene	83-32-9	6.1	0.10	7.38E+07
Acetone	67-64-1	6.00E-04	0.020	2.23E+06
Aldrin	309-00-2	49	0.0017	7,793
Alpha-BHC	319-84-6	1.8	0.0017	285
Aluminum	7429-90-5	1,500	5.0	--[d]
Anthracene	120-12-7	24	0.050	--[d]
Antimony	7440-36-0	3.8	0.60	270,034
Aroclor-1016	12674-11-2	107	0.017	--[d]
Aroclor-1221	11104-28-2	10	0.017	5,773
Aroclor-1232	11141-16-5	10	0.017	5,773
Aroclor-1242	53469-21-9	45	0.017	97,738
Aroclor-1248	12672-29-6	44	0.017	91,112
Aroclor-1254	11097-69-1	76	0.017	--[d]
Aroclor-1260	11096-82-5	822	0.017	--[d]
Arsenic	7440-38-2	29	1.0	37,999
Barium	7440-39-3	25	0.50	--[d]
Benzo(a)anthracene	56-55-3	360	0.015	--[d]
Benzo(a)pyrene	50-32-8	5,500	0.015	--[d]
Benzo(b)fluoranthene	205-99-2	803	0.015	--[d]
Benzo(k)fluoranthene	207-08-9	1,230	0.015	--[d]
Beryllium	7440-41-7	790	0.20	--[d]
Bis(2-ethylhexyl) phthalate	117-81-7	110	0.33	--[d]
Boron	7440-42-8	3.0	2.0	1.08E+08
Butylbenzylphthalate	85-68-7	14	0.33	8.41E+06
Cadmium	7440-43-9	30	0.20	3.52E+06
Chlordane	57-74-9	51	0.017	--[d]
Chloroform	67-66-3	0.053	0.0050	1,289
Chromium	7440-47-3	200	0.20	--[d]
Chrysene	218-01-9	200	0.10	--[d]
Cobalt	7440-48-4	50	2.0	--[d]
Copper	7440-50-8	22	1.0	2.41E+08
Dibenz[a,h]anthracene	53-70-3	1,790	0.030	--[d]
Dibenzofuran	132-64-9	11	0.33	2.32E+06
Dieldrin	60-57-1	26	0.0033	2,733

Table 4-2. Summary of Groundwater Protective Soil Screening Levels for the 300 Area Source Operable Unit

Analyte	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection (pCi/g, µg/kg)[c]
Diethyl ether	60-29-7	0.0097	--	664,052
Di-n-butylphthalate	84-74-2	1.6	0.33	2.85E+07
Endosulfan I	959-98-8	2.0	0.0017	2.46E+06
Endosulfan II	33213-65-9	2.0	0.0033	2.46E+06
Fluoranthene	206-44-0	49	0.050	--[d]
Fluorene	86-73-7	7.7	0.030	6.17E+07
Fluoride	16984-48-8	150	5.0	--[d]
Heptachlor epoxide	1024-57-3	83	0.0017	--[d]
Hexachlorobutadiene	87-68-3	54	0.33	--[d]
Hexachloroethane	67-72-1	1.8	0.33	65,103
Hexavalent Chromium	18540-29-9	0.80	--	6,000[f]
Indeno(1,2,3-cd)pyrene	193-39-5	3,470	0.030	--[d]
Iron	7439-89-6	25	5.0	1.43E+08
Lead	7439-92-1	30	0.50	1.06E+07
Lithium	7439-93-2	50	2.5	--[d]
Manganese	7439-96-5	50	5.0	--[d]
Mercury	7439-97-6	30	--	1.41E+06
Methoxychlor	72-43-5	80	0.017	--[d]
Methylene chloride	75-09-2	0.010	0.0050	2,098
Molybdenum	7439-98-7	20	2.0	2.58E+07
Naphthalene	91-20-3	1.2	0.10	2.26E+06
Nickel	7440-02-0	65	4.0	--[d]
Nitrate	14797-55-8	0	2.5	1.36E+07
Nitrogen in Nitrite and Nitrate	NO2+NO3-N	0	--	3.03E+06
n-Nitrosodi-n-dipropylamine	621-64-7	0.024	0.33	330
Pentachlorophenol	87-86-5	0.59	0.33	5,346
Phenol	108-95-2	0.029	0.33	1.49E+06
Pyrene	129-00-0	68	0.050	--[d]
Selenium	7782-49-2	5.0	1.0	3.02E+06
Silver	7440-22-4	90	0.20	--[d]
Strontium	7440-24-6	25	1.0	--[d]
Tetrachloroethene	127-18-4	0.27	0.0050	275
Tin	7440-31-5	130	10	--[d]
Toluene	108-88-3	0.14	0.0050	1.15E+06
Total petroleum hydrocarbons - diesel range	TPHDIESEL	--	--	2.00E+06[g]
Total petroleum hydrocarbons - kerosene range	TPHKEROSENE	--	--	2.00E+06[g]
Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	--	--	2.00E+06[g]
Total_U_Isotopes	Total_U_Isotopes	--	--	101,630[h]
Trichloroethene	79-01-6	0.094	0.0050	690
Trichloromonofluoromethane	75-69-4	0.044	--	1.95E+06
Uranium	7440-61-1	2.0	--	101,630[h]
Vanadium	7440-62-2	1,000	2.5	--[d]
Zinc	7440-66-6	30	1.0	--[d]

Notes:

a. Distribution coefficient (Kd) values are taken preferentially from DOE/RL-96-17 (Table E-2) as described in ECF-HANFORD-12-0023. The Kd value for arsenic is taken from the Ecology CLRAC database (Ecology 2012).

b. Estimated quantitation limits (EQLs) are obtained from DOE/RL-2009-45 (Appendix A). The STOMP 1D soil screening level for all analytes defaults to the EQL when the calculated value is less than the EQL.

c. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd ≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

d. The calculated soil screening level for the analyte is considered non-representative because: (1) breakthrough is simulated within 1,000 years for some soil columns while other soil columns (a majority) show no breakthrough (breakthrough defined as concentrations below 1E-04 µg/L or activity below 1E-04 pCi/L), and/or (2) the calculated residual mass of contaminant in the pore volume is high enough to represent a substantial (and physically improbable) reduction in porosity.

Table 4-2. Summary of Groundwater Protective Soil Screening Levels for the 300 Area Source Operable Unit

Analyte	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection (pCi/g, µg/kg)[c]

e. Uranium isotopes are accounted for by converting from activity-based (pCi/g) to mass-based (µg/kg) concentrations and then summing to provide a mass-based total uranium exposure point concentration (identified as Total_U_Isotopes), as described in ECF-300NPL-11-0137.

f. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

g. The soil screening level for Total Petroleum Hydrocarbons is a default screening level obtained from WAC 173-340-900, Table 747-5, "Residual Saturation Screening Levels for TPH."

h. Due to the complex geochemistry of uranium in 300 Area source operable unit soils, uranium SSLs were derived using a site-speicific two-dimensional model as described in ECF-300FF5-11-0151.

-- = Not Applicable

DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area.*

DOE/RL-2009-45, *300 Area Remedial Investigation/Feasibility Study Sampling and Analysis Plan for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units.*

ECF-300FF5-11-0151, *Groundwater Flow and Uranium Transport Modeling in Support of the 300 Area FF-5 RI/FS Document.*

ECF-300FF5-11-0153, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for 300 Area Source Areas.*

ECF-300NPL-11-0137, *Computation of Exposure Point Concentrations for the 300-FF-2 Source Operable Unit.*

ECF-HANFORD-12-0023, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* .

Ecology, 2012, “CLARC Cleanup Levels and Risk Calculations,” Washington State Department of Ecology Web-based application available at https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx.

Table 4-3. Summary of Surface Water Protective Soil Screening Levels for the 300 Area Source Operable Unit

Analyte	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection (pCi/g, µg/kg)[c]
Radionuclides				
Americium-241	14596-10-2	200	1.0	--[d]
Cesium-137	10045-97-3	50	0.10	--[d]
Cobalt-60	10198-40-0	50	0.050	--[d]
Europium-155	14391-16-3	200	0.10	--[d]
Plutonium-238	13981-16-3	200	1.0	--[d]
Plutonium-239/240	PU-239/240	200	1.0	--[d]
Plutonium-241	14119-32-5	200	1.0	--[d]
Total beta radiostrontium	SR-RAD	25	--	227,428
Tritium	10028-17-8	0	--	9,176
Uranium-233/234	U-233/234	2.0	1.0	--[e]
Uranium-235	15117-96-1	2.0	0.50	--[e]
Uranium-238	U-238	2.0	1.0	--[e]
Nonradionuclides				
1,1,2,2-Tetrachloroethane	79-34-5	0.079	0.0050	210
1,2,4-Trichlorobenzene	120-82-1	1.7	0.33	37,238
1,4-Dichlorobenzene	106-46-7	0.62	0.0050	164,520
2,4-Dinitrotoluene	121-14-2	0.096	0.33	330
2-Butanone	78-93-3	0.0045	0.010	1.71E+08
2-Butoxyethanol	111-76-2	0.0010	--	2.58E+07
2-Chlorophenol	95-57-8	0.39	0.33	393,603
2-Methylnaphthalene	91-57-6	3.0	0.33	4.65E+06
4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	86	0.0033	--[d]
4-Chloro-3-methylphenol	59-50-7	0.49	0.33	1.87E+08
Acenaphthene	83-32-9	6.1	0.10	4.94E+07
Acetone	67-64-1	6.00E-04	0.020	2.28E+08
Aldrin	309-00-2	49	0.0017	148
Alpha-BHC	319-84-6	1.8	0.0017	53
Aluminum	7429-90-5	1,500	5.0	--[d]
Anthracene	120-12-7	24	0.050	--[d]
Antimony	7440-36-0	3.8	0.60	252,032
Aroclor-1016	12674-11-2	107	0.017	--[d]
Aroclor-1221	11104-28-2	10	0.017	17
Aroclor-1232	11141-16-5	10	0.017	17
Aroclor-1242	53469-21-9	45	0.017	143
Aroclor-1248	12672-29-6	44	0.017	133
Aroclor-1254	11097-69-1	76	0.017	--[d]
Aroclor-1260	11096-82-5	822	0.017	--[d]
Arsenic	7440-38-2	29	1.0	11,726
Barium	7440-39-3	25	0.50	--[d]
Benzo(a)anthracene	56-55-3	360	0.015	--[d]
Benzo(a)pyrene	50-32-8	5,500	0.015	--[d]
Benzo(b)fluoranthene	205-99-2	803	0.015	--[d]
Benzo(k)fluoranthene	207-08-9	1,230	0.015	--[d]
Beryllium	7440-41-7	790	0.20	--[d]
Bis(2-ethylhexyl) phthalate	117-81-7	110	0.33	--[d]
Boron	7440-42-8	3.0	2.0	--[f]
Butylbenzylphthalate	85-68-7	14	0.33	1.50E+06
Cadmium	7440-43-9	30	0.20	176,066
Chlordane	57-74-9	51	0.017	--[d]
Chloroform	67-66-3	0.053	0.0050	5,207
Chromium	7440-47-3	200	0.20	--[d]
Chrysene	218-01-9	200	0.10	--[d]
Cobalt	7440-48-4	50	2.0	--[d]
Copper	7440-50-8	22	1.0	3.40E+06
Dibenz[a,h]anthracene	53-70-3	1,790	0.030	--[d]
Dibenzofuran	132-64-9	11	0.33	246,969
Dieldrin	60-57-1	26	0.0033	26

Table 4-3. Summary of Surface Water Protective Soil Screening Levels for the 300 Area Source Operable Unit

Analyte	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection (pCi/g, µg/kg)[c]
Diethyl ether	60-29-7	0.0097	--	3.98E+07
Di-n-butylphthalate	84-74-2	1.6	0.33	3.56E+07
Endosulfan I	959-98-8	2.0	0.0017	1,433
Endosulfan II	33213-65-9	2.0	0.0033	1,433
Fluoranthene	206-44-0	49	0.050	2.82E+08
Fluorene	86-73-7	7.7	0.030	1.06E+08
Fluoride	16984-48-8	150	5.0	--[d]
Heptachlor epoxide	1024-57-3	83	0.0017	--[d]
Hexachlorobutadiene	87-68-3	54	0.33	--[d]
Hexachloroethane	67-72-1	1.8	0.33	29,166
Hexavalent Chromium	18540-29-9	0.80	--	6,000[g]
Indeno(1,2,3-cd)pyrene	193-39-5	3,470	0.030	--[d]
Iron	7439-89-6	25	5.0	1.43E+08
Lead	7439-92-1	30	0.50	1.48E+06
Lithium	7439-93-2	50	2.5	--[f]
Manganese	7439-96-5	50	5.0	--[d]
Mercury	7439-97-6	30	--	8,451
Methoxychlor	72-43-5	80	0.017	--[d]
Methylene chloride	75-09-2	0.010	0.0050	1,931
Molybdenum	7439-98-7	20	2.0	--[d]
Naphthalene	91-20-3	1.2	0.10	6.97E+07
Nickel	7440-02-0	65	4.0	--[d]
Nitrate	14797-55-8	0	2.5	1.36E+07
Nitrogen in Nitrite and Nitrate	NO2+NO3-N	0	--	3.03E+06
n-Nitrosodi-n-dipropylamine	621-64-7	0.024	0.33	330
Pentachlorophenol	87-86-5	0.59	0.33	1,980
Phenol	108-95-2	0.029	0.33	6.21E+06
Pyrene	129-00-0	68	0.050	--[d]
Selenium	7782-49-2	5.0	1.0	302,457
Silver	7440-22-4	90	0.20	--[d]
Strontium	7440-24-6	25	1.0	--[d]
Tetrachloroethene	127-18-4	0.27	0.0050	1,316
Tin	7440-31-5	130	10	--[d]
Toluene	108-88-3	0.14	0.0050	2.35E+06
Total petroleum hydrocarbons - diesel range	TPHDIESEL	--	--	--[f]
Total petroleum hydrocarbons - kerosene range	TPHKEROSENE	--	--	--[f]
Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	--	--	--[f]
Total_U_Isotopes	Total_U_Isotopes	--	--	2.64E+06[h]
Trichloroethene	79-01-6	0.094	0.0050	3,511
Trichloromonofluoromethane	75-69-4	0.044	--	2.90E+07
Uranium	7440-61-1	2.0	--	2.64E+06[h]
Vanadium	7440-62-2	1,000	2.5	--[f]
Zinc	7440-66-6	30	1.0	6.41E+07

Notes:

a. Distribution coefficient (Kd) values are taken preferentially from DOE/RL-96-17 (Table E-2) as described in ECF-HANFORD-12-0023. The Kd value for arsenic is taken from the Ecology CLRAC database (Ecology 2012).

b. Estimated quantitation limits (EQLs) are obtained from DOE/RL-2009-45 (Appendix A). The STOMP 1D soil screening level for all analytes defaults to the EQL when the calculated value is less than the EQL.

c. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd ≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

d. The calculated soil screening level for the analyte is considered non-representative because: (1) breakthrough is simulated within 1,000 years for some soil columns while other soil columns (a majority) show no breakthrough (breakthrough defined as concentrations below 1E-04 µg/L or activity below 1E-04 pCi/L), and/or (2) the calculated residual mass of contaminant in the pore volume is high enough to represent a substantial (and physically improbable) reduction in porosity.

Table 4-3. Summary of Surface Water Protective Soil Screening Levels for the 300 Area Source Operable Unit

Analyte	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection (pCi/g, µg/kg)[c]

e. Uranium isotopes are accounted for by converting from activity-based (pCi/g) to mass-based (µg/kg) concentrations and then summing to provide a mass-based total uranium exposure point concentration (identified as Total_U_Isotopes), as described in ECF-300NPL-11-0137.

f. A soil screening level is not calculated because a surface water cleanup level or surface water standard is not available for the analyte.

g. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

h. Due to the complex geochemistry of uranium in 300 Area source operable unit soils, uranium SSLs were derived using a site-speicific two-dimensional model as described in ECF-300FF5-11-0151.

-- = Not Applicable

DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area.*

DOE/RL-2009-45, *300 Area Remedial Investigation/Feasibility Study Sampling and Analysis Plan for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units.*

ECF-300FF5-11-0151, *Groundwater Flow and Uranium Transport Modeling in Support of the 300 Area FF-5 RI/FS Document.*

ECF-300FF5-11-0153, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for 300 Area Source Areas.*

ECF-300NPL-11-0137, *Computation of Exposure Point Concentrations for the 300-FF-2 Source Operable Unit.*

ECF-HANFORD-12-0023, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* .

Ecology, 2012, "CLARC Cleanup Levels and Risk Calculations," Washington State Department of Ecology Web-based application available at https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx.

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
300 ASH PITS_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	52
300 ASH PITS_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,078
300 ASH PITS_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	96
300 ASH PITS_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	76
300 ASH PITS_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,450
300 ASH PITS_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.039
300 ASH PITS_Shallow	Rad	Uranium-238	U-238	pCi/g	0.82
300 VTS_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.029
300-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	13,500
300-10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	200
300-10_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	230
300-10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,078
300-10_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.16
300-10_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.041
300-10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4
300-109_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.62E+06
300-109_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	122
300-109_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	40
300-109_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,420
300-109_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	63,300
300-109_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.2
300-109_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	2.3
300-109_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	180
300-109_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	632
300-109_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	59
300-109_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,950
300-109_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	1.8
300-109_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	6,420
300-109_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,800
300-109_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	14
300-109_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.75E+07
300-109_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,890
300-109_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	278,000
300-109_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	22
300-109_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	341
300-109_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,490
300-109_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	1.6
300-109_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,108
300-109_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	47,600
300-109_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	34,700
300-109_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.4
300-109_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4
300-109_Staging Pile Area_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.78E+06
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	37
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	19
300-109_Staging Pile Area_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,580
300-109_Staging Pile Area_Focused	non-Rad	Barium	7440-39-3	µg/kg	72,700
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	2.1
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.3
300-109_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.3
300-109_Staging Pile Area_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	203
300-109_Staging Pile Area_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,060
300-109_Staging Pile Area_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	66
300-109_Staging Pile Area_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,170
300-109_Staging Pile Area_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,950
300-109_Staging Pile Area_Focused	non-Rad	Copper	7440-50-8	µg/kg	11,600
300-109_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	5.1
300-109_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	29
300-109_Staging Pile Area_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.84E+07
300-109_Staging Pile Area_Focused	non-Rad	Lead	7439-92-1	µg/kg	5,030
300-109_Staging Pile Area_Focused	non-Rad	Manganese	7439-96-5	µg/kg	286,000
300-109_Staging Pile Area_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	408
300-109_Staging Pile Area_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,570
300-109_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	µg/kg	7.0
300-109_Staging Pile Area_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,450
300-109_Staging Pile Area_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,877
300-109_Staging Pile Area_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	45,100
300-109_Staging Pile Area_Focused	non-Rad	Zinc	7440-66-6	µg/kg	48,800
300-109_Staging Pile Area_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	2.5
300-109_Staging Pile Area_Focused	Rad	Uranium-238	U-238	pCi/g	2.3
300-18_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,200
300-18_Shallow	non-Rad	Barium	7440-39-3	µg/kg	63,400
300-18_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	650
300-18_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	40
300-18_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	6,900
300-18_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,600
300-18_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,136
300-18_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.65
300-18_Shallow	Rad	Uranium-238	U-238	pCi/g	0.41
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	120,000
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	230,000

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
300-23_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	52,000
300-259_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	5.99E+06
300-259_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	322
300-259_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,096
300-259_Shallow	non-Rad	Barium	7440-39-3	µg/kg	75,232
300-259_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	226
300-259_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,303
300-259_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	252
300-259_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,901
300-259_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	5,831
300-259_Shallow	non-Rad	Copper	7440-50-8	µg/kg	10,692
300-259_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07
300-259_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,625
300-259_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	318,874
300-259_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	10
300-259_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	303
300-259_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,751
300-259_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,876
300-259_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	42,626
300-259_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	479,584
300-259_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.6
300-259_Shallow	Rad	Uranium-238	U-238	pCi/g	1.3
300-260_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.17E+06
300-260_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	922
300-260_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,160
300-260_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	122,000
300-260_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	239
300-260_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	8,360
300-260_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	110
300-260_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,890
300-260_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,430
300-260_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	73,300
300-260_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.04E+07
300-260_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	18,300
300-260_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	328,000
300-260_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	12
300-260_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	537
300-260_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,200
300-260_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	206
300-260_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,800
300-260_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	59,000
300-260_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	77,400
300-260_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.25
300-260_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	4.3
300-272_Overburden_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	13,100
300-272_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	43,100
300-275_Shallow_1	non-Rad	Acenaphthene	83-32-9	µg/kg	960
300-275_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	5.61E+06
300-275_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	260
300-275_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	2,211
300-275_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	75,261
300-275_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.3
300-275_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.9
300-275_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	452
300-275_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	1,466
300-275_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	83
300-275_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	8,022
300-275_Shallow_1	non-Rad	Chrysene	218-01-9	µg/kg	2.2
300-275_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	5,847
300-275_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	42,923
300-275_Shallow_1	non-Rad	Fluoranthene	206-44-0	µg/kg	2,300
300-275_Shallow_1	non-Rad	Fluorene	86-73-7	µg/kg	81
300-275_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	1.79E+07
300-275_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	7,189
300-275_Shallow_1	non-Rad	Lithium	7439-93-2	µg/kg	6,686
300-275_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	276,815
300-275_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	17
300-275_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	378
300-275_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	9,461
300-275_Shallow_1	non-Rad	Silver	7440-22-4	µg/kg	121
300-275_Shallow_1	non-Rad	Strontium	7440-24-6	µg/kg	20,196
300-275_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,483
300-275_Shallow_1	non-Rad	Uranium	7440-61-1	µg/kg	2,500
300-275_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	45,128
300-275_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	41,014
300-275_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.046
300-275_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	7.7
300-275_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.0
300-275_Shallow_1	Rad	Uranium-238	U-238	pCi/g	7.4
300-275_Shallow_2	non-Rad	Acenaphthene	83-32-9	µg/kg	3.6
300-275_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	6.24E+06

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
300-275_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,761
300-275_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	68,607
300-275_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	254
300-275_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	1,147
300-275_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	144
300-275_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	8,994
300-275_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	5,977
300-275_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	11,596
300-275_Shallow_2	non-Rad	Fluoranthene	206-44-0	µg/kg	56
300-275_Shallow_2	non-Rad	Fluorene	86-73-7	µg/kg	2.6
300-275_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07
300-275_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	4,099
300-275_Shallow_2	non-Rad	Lithium	7439-93-2	µg/kg	7,067
300-275_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	292,731
300-275_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	28
300-275_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	404
300-275_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	9,593
300-275_Shallow_2	non-Rad	Strontium	7440-24-6	µg/kg	27,081
300-275_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,149
300-275_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,725
300-275_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	51,632
300-275_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	41,245
300-275_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3
300-275_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	0.24
300-275_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.2
300-33, 300-41, 300-256_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.32E+06
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1016	12674-11-2	µg/kg	10
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	16
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	190
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	84
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	17
300-33, 300-41, 300-256_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,638
300-33, 300-41, 300-256_Shallow	non-Rad	Barium	7440-39-3	µg/kg	72,411
300-33, 300-41, 300-256_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	256
300-33, 300-41, 300-256_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,484
300-33, 300-41, 300-256_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	228
300-33, 300-41, 300-256_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	94
300-33, 300-41, 300-256_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	8,781
300-33, 300-41, 300-256_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,273
300-33, 300-41, 300-256_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,662
300-33, 300-41, 300-256_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	1,651
300-33, 300-41, 300-256_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.00E+07
300-33, 300-41, 300-256_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,268
300-33, 300-41, 300-256_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	5,495
300-33, 300-41, 300-256_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	314,762
300-33, 300-41, 300-256_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	16
300-33, 300-41, 300-256_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	2.9
300-33, 300-41, 300-256_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	486
300-33, 300-41, 300-256_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,880
300-33, 300-41, 300-256_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	8,617
300-33, 300-41, 300-256_Shallow	non-Rad	Silver	7440-22-4	µg/kg	782
300-33, 300-41, 300-256_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	7,260
300-33, 300-41, 300-256_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	52,694
300-33, 300-41, 300-256_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,462
300-33, 300-41, 300-256_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.1
300-33, 300-41, 300-256_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.34
300-33, 300-41, 300-256_Shallow	Rad	Uranium-238	U-238	pCi/g	2.1
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.51E+06
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	330
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	385
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,240
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	64,600
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	169
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,030
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	100
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,080
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,640
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,400
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	1,300
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.86E+07
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	3,160
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Lithium	7439-93-2	µg/kg	6,580
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	259,000
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2.2
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	275
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,040
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	17,900
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,460
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	51,400
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	38,900

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	3.0
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	2.2
300-37_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	100
300-37_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,200
300-44_Overburden_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	9,100
300-44_Overburden_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,027
300-44_Overburden_Focused	Rad	Uranium-238	U-238	pCi/g	0.35
300-44_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.71E+06
300-44_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	4,100
300-44_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	16,900
300-44_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	75,200
300-44_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	480
300-44_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,300
300-44_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,200
300-44_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	7,800
300-44_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.94E+07
300-44_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	303,000
300-44_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,600
300-44_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	872
300-44_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	43,200
300-44_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	37,800
300-44_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.29
300-45_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	86
300-45_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	290
300-45_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,600
300-45_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.023
300-45_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.061
300-45_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2
300-49_Overburden	non-Rad	1,2,4-Trichlorobenzene	120-82-1	µg/kg	31
300-49_Overburden	non-Rad	1,4-Dichlorobenzene	106-46-7	µg/kg	29
300-49_Overburden	non-Rad	2,4-Dinitrotoluene	121-14-2	µg/kg	19
300-49_Overburden	non-Rad	2-Chlorophenol	95-57-8	µg/kg	51
300-49_Overburden	non-Rad	4-Chloro-3-methylphenol	59-50-7	µg/kg	46
300-49_Overburden	non-Rad	Acenaphthene	83-32-9	µg/kg	31
300-49_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.30E+06
300-49_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	232
300-49_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,008
300-49_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,291
300-49_Overburden	non-Rad	Barium	7440-39-3	µg/kg	76,068
300-49_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	201
300-49_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	174
300-49_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	18,106
300-49_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,127
300-49_Overburden	non-Rad	Copper	7440-50-8	µg/kg	536,000
300-49_Overburden	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	52
300-49_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.08E+07
300-49_Overburden	non-Rad	Lead	7439-92-1	µg/kg	36,964
300-49_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	316,669
300-49_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	13,035
300-49_Overburden	non-Rad	n-Nitrosodi-n-dipropylamine	621-64-7	µg/kg	40
300-49_Overburden	non-Rad	Pentachlorophenol	87-86-5	µg/kg	50
300-49_Overburden	non-Rad	Phenol	108-95-2	µg/kg	50
300-49_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	40
300-49_Overburden	non-Rad	Silver	7440-22-4	µg/kg	703
300-49_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,066
300-49_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	50,380
300-49_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	141,984
300-49_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	1.0
300-49_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.057
300-49_Overburden	Rad	Uranium-238	U-238	pCi/g	1.0
300-49_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.92E+06
300-49_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	176
300-49_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,431
300-49_Shallow	non-Rad	Barium	7440-39-3	µg/kg	89,874
300-49_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	303
300-49_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,170
300-49_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,323
300-49_Shallow	non-Rad	Copper	7440-50-8	µg/kg	14,870
300-49_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.59E+07
300-49_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,629
300-49_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	361,805
300-49_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	10,664
300-49_Shallow	non-Rad	Silver	7440-22-4	µg/kg	621
300-49_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,983
300-49_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	58,672
300-49_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	54,651
300-49_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.15
300-49_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.3
300-49_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24
300-49_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1
300-50_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.68E+06

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
300-50_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	33
300-50_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	229
300-50_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	6,897
300-50_Overburden	non-Rad	Barium	7440-39-3	µg/kg	117,742
300-50_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	325
300-50_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	563
300-50_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	12,197
300-50_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	9,389
300-50_Overburden	non-Rad	Copper	7440-50-8	µg/kg	64,527
300-50_Overburden	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07
300-50_Overburden	non-Rad	Lead	7439-92-1	µg/kg	5,905
300-50_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	314,271
300-50_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	15,229
300-50_Overburden	non-Rad	Silver	7440-22-4	µg/kg	1,202
300-50_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	17,919
300-50_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	45,243
300-50_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	45,889
300-50_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.056
300-50_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	6.0
300-50_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.45
300-50_Overburden	Rad	Uranium-238	U-238	pCi/g	6.0
300-50_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.88E+06
300-50_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	3,000
300-50_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	126
300-50_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,403
300-50_Shallow	non-Rad	Barium	7440-39-3	µg/kg	103,029
300-50_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	282
300-50_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	19
300-50_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	463
300-50_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	16,841
300-50_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,109
300-50_Shallow	non-Rad	Copper	7440-50-8	µg/kg	16,820
300-50_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07
300-50_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,381
300-50_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	318,120
300-50_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,413
300-50_Shallow	non-Rad	Silver	7440-22-4	µg/kg	2,992
300-50_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	22,938
300-50_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	46,964
300-50_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,344
300-50_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.056
300-50_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	7.9
300-50_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.66
300-50_Shallow	Rad	Uranium-238	U-238	pCi/g	8.4
300-8_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	574
300-8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,374
300-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.79
300-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.82
316-1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	40,572
316-1_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.10
316-1_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.32
316-1_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	13
316-1_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	1.1
316-1_Overburden	Rad	Uranium-238	U-238	pCi/g	13
316-1_Shallow_1	non-Rad	Aroclor-1248	12672-29-6	µg/kg	3,000
316-1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	19,014
316-1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	69
316-1_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	98
316-1_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	83,027
316-1_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.032
316-1_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.2
316-1_Shallow_1	Rad	Uranium-238	U-238	pCi/g	28
316-1_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	1.11E+07
316-1_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	490
316-1_Shallow_3	non-Rad	Aroclor-1254	11097-69-1	µg/kg	98
316-1_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	5,138
316-1_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	129,106
316-1_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	416
316-1_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	342
316-1_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	474
316-1_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	50,455
316-1_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	9,703
316-1_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	1.37E+06
316-1_Shallow_3	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	3.2
316-1_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.44E+07
316-1_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	14,409
316-1_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	392,825
316-1_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	1,105
316-1_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	94,656
316-1_Shallow_3	non-Rad	Phenol	108-95-2	µg/kg	28
316-1_Shallow_3	non-Rad	Selenium	7782-49-2	µg/kg	1,444

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
316-1_Shallow_3	non-Rad	Silver	7440-22-4	µg/kg	13,196
316-1_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	63,074
316-1_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	56,707
316-1_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	82,016
316-1_Shallow_3	Rad	Cesium-137	10045-97-3	pCi/g	0.37
316-1_Shallow_3	Rad	Cobalt-60	10198-40-0	pCi/g	2.3
316-1_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	23
316-1_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	2.6
316-1_Shallow_3	Rad	Uranium-238	U-238	pCi/g	21
316-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	µg/kg	62
316-1_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	42,963
316-1_Shallow_4	Rad	Cobalt-60	10198-40-0	pCi/g	0.12
316-1_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	16
316-1_Shallow_4	Rad	Uranium-235	15117-96-1	pCi/g	1.1
316-1_Shallow_4	Rad	Uranium-238	U-238	pCi/g	14
316-2_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	210,452
316-2_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.031
316-2_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.092
316-2_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	86
316-2_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	12
316-2_Shallow_1	Rad	Uranium-238	U-238	pCi/g	69
316-2_Shallow_2	non-Rad	Aroclor-1248	12672-29-6	µg/kg	697
316-2_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	µg/kg	42
316-2_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	110
316-2_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	291,369
316-2_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	0.45
316-2_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.45
316-2_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	115
316-2_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	11
316-2_Shallow_2	Rad	Uranium-238	U-238	pCi/g	96
316-2_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	8,000
316-2_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	260
316-2_Shallow_3	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	180
316-2_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	73,174
316-2_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.91
316-2_Shallow_3	Rad	Uranium-238	U-238	pCi/g	24
316-5_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	3,070
316-5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	38
316-5_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	146
316-5_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	100
316-5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	271,835
316-5_Shallow_1	Rad	Americium-241	14596-10-2	pCi/g	0.48
316-5_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	2.3
316-5_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	19
316-5_Shallow_1	Rad	Uranium-238	U-238	pCi/g	89
316-5_Shallow_2	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	140
316-5_Shallow_2	non-Rad	2-Butoxyethanol	111-76-2	µg/kg	240
316-5_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	3,180
316-5_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	76,700
316-5_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	180
316-5_Shallow_2	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	110
316-5_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	6,900
316-5_Shallow_2	non-Rad	Chrysene	218-01-9	µg/kg	38
316-5_Shallow_2	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	146
316-5_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	3,200
316-5_Shallow_2	non-Rad	Selenium	7782-49-2	µg/kg	490
316-5_Shallow_2	non-Rad	Silver	7440-22-4	µg/kg	3,600
316-5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	204,701
316-5_Shallow_2	Rad	Americium-241	14596-10-2	pCi/g	0.12
316-5_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	1.7
316-5_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.12
316-5_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	9.0
316-5_Shallow_2	Rad	Uranium-238	U-238	pCi/g	68
316-5_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	57
316-5_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	70
316-5_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52
316-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,300
316-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	190
316-5_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	1,500
316-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	138,095
316-5_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.8
316-5_Shallow_Focused	Rad	Europium-155	14391-16-3	pCi/g	0.072
316-5_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	7.7
316-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	45
331 LSLDF_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	25
331 LSLDF_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	590
331 LSLDF_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	0.56
331 LSLDF_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	µg/kg	0.39
331 LSLDF_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.90E+06
331 LSLDF_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	360
331 LSLDF_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	850

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
331 LSLDF_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,400
331 LSLDF_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	78,600
331 LSLDF_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	570
331 LSLDF_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	910
331 LSLDF_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,700
331 LSLDF_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	340
331 LSLDF_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	140
331 LSLDF_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,300
331 LSLDF_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,600
331 LSLDF_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,400
331 LSLDF_Shallow_Focused	non-Rad	Dieldrin	60-57-1	µg/kg	13
331 LSLDF_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	98
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan I	959-98-8	µg/kg	1.9
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	µg/kg	3.1
331 LSLDF_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.20E+07
331 LSLDF_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	9,000
331 LSLDF_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	349,000
331 LSLDF_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	110
331 LSLDF_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	µg/kg	3.3
331 LSLDF_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	11
331 LSLDF_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	590
331 LSLDF_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000
331 LSLDF_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	41,700
331 LSLDF_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	9,500
331 LSLDF_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,100
331 LSLDF_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	2,300
331 LSLDF_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	53,100
331 LSLDF_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	137,000
331 LSLDF_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.54
331 LSLDF_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.47
600-243_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	µg/kg	279
600-243_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	31
600-243_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	1,300
600-243_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	27
600-243_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	18
600-243_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,159
600-243_Shallow	non-Rad	Barium	7440-39-3	µg/kg	292,072
600-243_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	43
600-243_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	43
600-243_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	46
600-243_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	32
600-243_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	2,079
600-243_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	432
600-243_Shallow	non-Rad	Boron	7440-42-8	µg/kg	294,463
600-243_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	793
600-243_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	18,006
600-243_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	63
600-243_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,207
600-243_Shallow	non-Rad	Copper	7440-50-8	µg/kg	53,981
600-243_Shallow	non-Rad	Dibenzofuran	132-64-9	µg/kg	78
600-243_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	37
600-243_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	79
600-243_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	28
600-243_Shallow	non-Rad	Lead	7439-92-1	µg/kg	40,139
600-243_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	208,289
600-243_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	1,869
600-243_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	204
600-243_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	21,395
600-243_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	70
600-243_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	5,709
600-243_Shallow	non-Rad	Silver	7440-22-4	µg/kg	500
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	95,319
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	334,524
600-243_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	46,986
600-243_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	84,099
600-259_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.034
600-259_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.068
600-259_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.038
600-47_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,300
600-47_Shallow	non-Rad	Barium	7440-39-3	µg/kg	67,000
600-47_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	500
600-47_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	90
600-47_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	5,500
600-47_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,500
600-47_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,303
600-47_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.4
600-47_Shallow	Rad	Uranium-238	U-238	pCi/g	1.6
618-1_Deep	non-Rad	Aluminum	7429-90-5	µg/kg	6.37E+06
618-1_Deep	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,760
618-1_Deep	non-Rad	Aroclor-1260	11096-82-5	µg/kg	294
618-1_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,550

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
618-1_Deep	non-Rad	Barium	7440-39-3	µg/kg	299,000
618-1_Deep	non-Rad	Beryllium	7440-41-7	µg/kg	218
618-1_Deep	non-Rad	Boron	7440-42-8	µg/kg	1,360
618-1_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	263
618-1_Deep	non-Rad	Chromium	7440-47-3	µg/kg	7,740
618-1_Deep	non-Rad	Cobalt	7440-48-4	µg/kg	8,600
618-1_Deep	non-Rad	Copper	7440-50-8	µg/kg	46,300
618-1_Deep	non-Rad	Fluoride	16984-48-8	µg/kg	2,800
618-1_Deep	non-Rad	Iron	7439-89-6	µg/kg	2.47E+07
618-1_Deep	non-Rad	Lead	7439-92-1	µg/kg	58,400
618-1_Deep	non-Rad	Lithium	7439-93-2	µg/kg	5,980
618-1_Deep	non-Rad	Manganese	7439-96-5	µg/kg	352,000
618-1_Deep	non-Rad	Mercury	7439-97-6	µg/kg	1,180
618-1_Deep	non-Rad	Molybdenum	7439-98-7	µg/kg	493
618-1_Deep	non-Rad	Nickel	7440-02-0	µg/kg	17,600
618-1_Deep	non-Rad	Nitrate	14797-55-8	µg/kg	1,700
618-1_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	220
618-1_Deep	non-Rad	Uranium	7440-61-1	µg/kg	37,400
618-1_Deep	non-Rad	Vanadium	7440-62-2	µg/kg	73,000
618-1_Deep	non-Rad	Zinc	7440-66-6	µg/kg	134,000
618-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.46
618-1_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	33
618-1_Deep	Rad	Uranium-235	15117-96-1	pCi/g	2.7
618-1_Deep	Rad	Uranium-238	U-238	pCi/g	32
618-1_Deep_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.57E+06
618-1_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	407
618-1_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1.24E+06
618-1_Deep_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	99
618-1_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,580
618-1_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	1.87E+06
618-1_Deep_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	323
618-1_Deep_Focused	non-Rad	Boron	7440-42-8	µg/kg	6,620
618-1_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,030
618-1_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	18,900
618-1_Deep_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,920
618-1_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	68,700
618-1_Deep_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	3,300
618-1_Deep_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.41E+07
618-1_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	333,000
618-1_Deep_Focused	non-Rad	Lithium	7439-93-2	µg/kg	8,450
618-1_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	351,000
618-1_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	8,940
618-1_Deep_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	2,140
618-1_Deep_Focused	non-Rad	Nickel	7440-02-0	µg/kg	13,700
618-1_Deep_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	11,900
618-1_Deep_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,560
618-1_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,290
618-1_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	209,000
618-1_Deep_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	70,900
618-1_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	82,000
618-1_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	6.5
618-1_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	70
618-1_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.5
618-1_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	65
618-1_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.21E+06
618-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	264
618-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	54
618-1_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,280
618-1_Shallow	non-Rad	Barium	7440-39-3	µg/kg	97,200
618-1_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	188
618-1_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,190
618-1_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	68
618-1_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,930
618-1_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,360
618-1_Shallow	non-Rad	Copper	7440-50-8	µg/kg	11,400
618-1_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	400
618-1_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07
618-1_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,100
618-1_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	6,380
618-1_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	300,000
618-1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	31
618-1_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	336
618-1_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,150
618-1_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	1,600
618-1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	300
618-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,224
618-1_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	56,300
618-1_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	42,100
618-1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9
618-1_Shallow	Rad	Uranium-238	U-238	pCi/g	1.5
618-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	1.22E+07

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
618-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	455
618-1_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	35
618-1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	981
618-1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	56
618-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	6,090
618-1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	102,000
618-1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	371
618-1_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	3,740
618-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	266
618-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	19,500
618-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,600
618-1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	23,800
618-1_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	900
618-1_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.28E+07
618-1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,210
618-1_Shallow_Focused	non-Rad	Lithium	7439-93-2	µg/kg	13,300
618-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	403,000
618-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	198
618-1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	356
618-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	16,800
618-1_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	3,800
618-1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	260
618-1_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,120
618-1_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	7,080
618-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	64,700
618-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	68,100
618-1_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11
618-1_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.99
618-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	8.2
618-12_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	8,557
618-12_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	63
618-12_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	60
618-12_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	32,092
618-12_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.47
618-12_Shallow	Rad	Uranium-238	U-238	pCi/g	11
618-13_Shallow	non-Rad	Acetone	67-64-1	µg/kg	8.6
618-13_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.34E+06
618-13_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	312
618-13_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,500
618-13_Shallow	non-Rad	Barium	7440-39-3	µg/kg	74,000
618-13_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	212
618-13_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,050
618-13_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	63
618-13_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,700
618-13_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,290
618-13_Shallow	non-Rad	Copper	7440-50-8	µg/kg	11,500
618-13_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.01E+07
618-13_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,620
618-13_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	344,000
618-13_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	5.1
618-13_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	420
618-13_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,400
618-13_Shallow	non-Rad	Tin	7440-31-5	µg/kg	1,050
618-13_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,750
618-13_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	55,800
618-13_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,400
618-13_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.038
618-13_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9
618-13_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7
618-13_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	5.9
618-13_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.22E+06
618-13_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	233
618-13_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,390
618-13_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	57,700
618-13_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	184
618-13_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	960
618-13_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	47
618-13_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,740
618-13_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,710
618-13_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,100
618-13_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	150
618-13_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.79E+07
618-13_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	4,940
618-13_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	268,000
618-13_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	5.0
618-13_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	297
618-13_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000
618-13_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	745
618-13_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	1,500
618-13_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	48,600
618-13_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	37,100

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
618-13_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1
618-13_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.96
618-2_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	1,500
618-2_Deep	non-Rad	Barium	7440-39-3	µg/kg	83,300
618-2_Deep	non-Rad	Chromium	7440-47-3	µg/kg	6,700
618-2_Deep	non-Rad	Lead	7439-92-1	µg/kg	6,600
618-2_Deep	non-Rad	Selenium	7782-49-2	µg/kg	780
618-2_Deep	non-Rad	Tin	7440-31-5	µg/kg	2,900
618-2_Deep	non-Rad	Uranium	7440-61-1	µg/kg	501,000
618-2_Deep	Rad	Americium-241	14596-10-2	pCi/g	7.9
618-2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	1.0
618-2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	1.5
618-2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	91
618-2_Deep	Rad	Plutonium-241	14119-32-5	pCi/g	42
618-2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	12
618-2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	161
618-2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.78
618-2_Deep	Rad	Uranium-238	U-238	pCi/g	165
618-2_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	6.9
618-2_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,300
618-2_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	109,000
618-2_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	27
618-2_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	200
618-2_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,400
618-2_Deep_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	18
618-2_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,800
618-2_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	1,200
618-2_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	600
618-2_Deep_Focused	non-Rad	Tin	7440-31-5	µg/kg	42,500
618-2_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	148,000
618-2_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	9.2
618-2_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.1
618-2_Deep_Focused	Rad	Plutonium-238	13981-16-3	pCi/g	1.6
618-2_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	92
618-2_Deep_Focused	Rad	Plutonium-241	14119-32-5	pCi/g	33
618-2_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	7.2
618-2_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	48
618-2_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	2.4
618-2_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	50
618-2_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,700
618-2_Overburden	non-Rad	Barium	7440-39-3	µg/kg	74,700
618-2_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	6,600
618-2_Overburden	non-Rad	Lead	7439-92-1	µg/kg	4,300
618-2_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	1,000
618-2_Overburden	non-Rad	Tin	7440-31-5	µg/kg	2,700
618-2_Overburden	non-Rad	Uranium	7440-61-1	µg/kg	1,140
618-2_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.058
618-2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.64
618-2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.59
618-2_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	1,900
618-2_Shallow	non-Rad	Barium	7440-39-3	µg/kg	79,100
618-2_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,100
618-2_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,600
618-2_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	760
618-2_Shallow	non-Rad	Tin	7440-31-5	µg/kg	2,400
618-2_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	4,530
618-2_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.81
618-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.2
618-2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	7.7
618-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.2
618-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.21
618-2_Shallow	Rad	Uranium-238	U-238	pCi/g	2.2
618-2_Staging Pile	non-Rad	Arsenic	7440-38-2	µg/kg	3,063
618-2_Staging Pile	non-Rad	Barium	7440-39-3	µg/kg	67,690
618-2_Staging Pile	non-Rad	Chromium	7440-47-3	µg/kg	6,424
618-2_Staging Pile	non-Rad	Lead	7439-92-1	µg/kg	4,011
618-2_Staging Pile	non-Rad	Uranium	7440-61-1	µg/kg	5,022
618-2_Staging Pile	Rad	Americium-241	14596-10-2	pCi/g	0.82
618-2_Staging Pile	Rad	Cesium-137	10045-97-3	pCi/g	0.095
618-2_Staging Pile	Rad	Plutonium-239/240	PU-239/240	pCi/g	10
618-2_Staging Pile	Rad	Tritium	10028-17-8	pCi/g	2.3
618-2_Staging Pile	Rad	Uranium-233/234	U-233/234	pCi/g	2.0
618-2_Staging Pile	Rad	Uranium-235	15117-96-1	pCi/g	0.12
618-2_Staging Pile	Rad	Uranium-238	U-238	pCi/g	2.0
618-3_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,800
618-3_Shallow	non-Rad	Barium	7440-39-3	µg/kg	76,500
618-3_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,700
618-3_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,900
618-3_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	659
618-3_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,610
618-3_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.68

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
618-3_Shallow	Rad	Uranium-238	U-238	pCi/g	0.75
618-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	238,577
618-3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	80
618-3_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.8
618-3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	79
618-4_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,200
618-4_Deep	non-Rad	Lead	7439-92-1	µg/kg	20,000
618-4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	64,506
618-4_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	20
618-4_Deep	Rad	Uranium-235	15117-96-1	pCi/g	1.1
618-4_Deep	Rad	Uranium-238	U-238	pCi/g	22
618-4_Deep_Focused	non-Rad	2-Butanone	78-93-3	µg/kg	130
618-4_Deep_Focused	non-Rad	Acetone	67-64-1	µg/kg	16
618-4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,600
618-4_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,700
618-4_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	104,000
618-4_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	4,700
618-4_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,500
618-4_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	27,700
618-4_Deep_Focused	non-Rad	Diethyl ether	60-29-7	µg/kg	1.0
618-4_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	24,900
618-4_Deep_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	40
618-4_Deep_Focused	non-Rad	Phenol	108-95-2	µg/kg	110
618-4_Deep_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	24
618-4_Deep_Focused	non-Rad	Toluene	108-88-3	µg/kg	4.8
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	34,000
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - kerosene range	TPHKEROSENE	µg/kg	42,000
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	65
618-4_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	20,777
618-4_Deep_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0
618-4_Deep_Focused	non-Rad	Trichloromonofluoromethane	75-69-4	µg/kg	12
618-4_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	7.2
618-4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.51
618-4_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	6.9
618-4_Overburden_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,500
618-4_Overburden_2	non-Rad	Lead	7439-92-1	µg/kg	4,700
618-4_Overburden_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,197
618-4_Overburden_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3
618-4_Overburden_2	Rad	Uranium-238	U-238	pCi/g	1.4
618-4_Overburden_3	non-Rad	Lead	7439-92-1	µg/kg	5,000
618-4_Overburden_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,171
618-4_Overburden_3	Rad	Uranium-233/234	U-233/234	pCi/g	0.42
618-4_Overburden_3	Rad	Uranium-235	15117-96-1	pCi/g	0.032
618-4_Overburden_3	Rad	Uranium-238	U-238	pCi/g	0.44
618-4_Overburden_4	non-Rad	Lead	7439-92-1	µg/kg	4,800
618-4_Overburden_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,323
618-4_Overburden_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.94
618-4_Overburden_4	Rad	Uranium-238	U-238	pCi/g	0.94
618-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,200
618-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	49,000
618-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	7,456
618-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	3.2
618-4_Shallow	Rad	Uranium-238	U-238	pCi/g	3.1
618-5_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	5,200
618-5_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	470
618-5_Deep	non-Rad	Chromium	7440-47-3	µg/kg	14,700
618-5_Deep	non-Rad	Lead	7439-92-1	µg/kg	82,300
618-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	26,618
618-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	8.6
618-5_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.46
618-5_Deep	Rad	Uranium-238	U-238	pCi/g	8.9
618-5_Deep_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.65E+06
618-5_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	1,800
618-5_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,500
618-5_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	106,000
618-5_Deep_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	672
618-5_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,500
618-5_Deep_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	10,500
618-5_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	21,400
618-5_Deep_Focused	non-Rad	Iron	7439-89-6	µg/kg	3.02E+07
618-5_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,600
618-5_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	579,000
618-5_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	33
618-5_Deep_Focused	non-Rad	Nickel	7440-02-0	µg/kg	11,300
618-5_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	2,270
618-5_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	36,540
618-5_Deep_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	79,500
618-5_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	65,800
618-5_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11
618-5_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.48
618-5_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	12

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
618-5_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,400
618-5_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	170
618-5_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	9,700
618-5_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,500
618-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	9,773
618-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	4.1
618-5_Overburden	Rad	Uranium-238	U-238	pCi/g	4.6
618-5_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,300
618-5_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,300
618-5_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,100
618-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,849
618-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.94
618-5_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1
618-5_Staging Pile_4	non-Rad	Arsenic	7440-38-2	µg/kg	3,300
618-5_Staging Pile_4	non-Rad	Cadmium	7440-43-9	µg/kg	50
618-5_Staging Pile_4	non-Rad	Chromium	7440-47-3	µg/kg	11,800
618-5_Staging Pile_4	non-Rad	Lead	7439-92-1	µg/kg	5,300
618-5_Staging Pile_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,364
618-5_Staging Pile_4	Rad	Uranium-233/234	U-233/234	pCi/g	1.2
618-5_Staging Pile_4	Rad	Uranium-238	U-238	pCi/g	1.1
618-5_Staging Pile_5	non-Rad	Arsenic	7440-38-2	µg/kg	2,700
618-5_Staging Pile_5	non-Rad	Chromium	7440-47-3	µg/kg	10,300
618-5_Staging Pile_5	non-Rad	Lead	7439-92-1	µg/kg	3,900
618-5_Staging Pile_5	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,326
618-5_Staging Pile_5	Rad	Uranium-233/234	U-233/234	pCi/g	1.5
618-5_Staging Pile_5	Rad	Uranium-235	15117-96-1	pCi/g	0.17
618-5_Staging Pile_5	Rad	Uranium-238	U-238	pCi/g	1.7
618-7_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	5.25E+06
618-7_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	560
618-7_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	1,891
618-7_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	68,874
618-7_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	278
618-7_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	65
618-7_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	10,227
618-7_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	9,152
618-7_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	16,120
618-7_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	2.60E+07
618-7_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	14,567
618-7_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	326,067
618-7_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	44
618-7_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	20,977
618-7_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,547
618-7_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	10,814
618-7_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	74,576
618-7_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	49,177
618-7_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.067
618-7_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	3.6
618-7_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	0.36
618-7_Shallow_1	Rad	Uranium-238	U-238	pCi/g	3.6
618-7_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	4.97E+06
618-7_Shallow_2	non-Rad	Antimony	7440-36-0	µg/kg	660
618-7_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,500
618-7_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	73,800
618-7_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	440
618-7_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	6,800
618-7_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	9,300
618-7_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	13,600
618-7_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	2.60E+07
618-7_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	2,800
618-7_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	364,000
618-7_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	20
618-7_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	9,700
618-7_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,500
618-7_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,574
618-7_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	74,700
618-7_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	46,200
618-7_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.57
618-7_Shallow_2	Rad	Uranium-238	U-238	pCi/g	0.53
618-7_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	6.74E+06
618-7_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	450
618-7_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	2,800
618-7_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	82,500
618-7_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	310
618-7_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	190
618-7_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	10,100
618-7_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	8,600
618-7_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	13,600
618-7_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.43E+07
618-7_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	4,300
618-7_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	357,000
618-7_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	20

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
618-7_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	10,100
618-7_Shallow_3	non-Rad	Tin	7440-31-5	µg/kg	1,800
618-7_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,852
618-7_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	68,200
618-7_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	44,500
618-7_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	1.1
618-7_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.085
618-7_Shallow_3	Rad	Uranium-238	U-238	pCi/g	0.95
618-7_Shallow_4	non-Rad	Aluminum	7429-90-5	µg/kg	5.65E+06
618-7_Shallow_4	non-Rad	Antimony	7440-36-0	µg/kg	250
618-7_Shallow_4	non-Rad	Arsenic	7440-38-2	µg/kg	5,200
618-7_Shallow_4	non-Rad	Barium	7440-39-3	µg/kg	57,900
618-7_Shallow_4	non-Rad	Beryllium	7440-41-7	µg/kg	220
618-7_Shallow_4	non-Rad	Cadmium	7440-43-9	µg/kg	90
618-7_Shallow_4	non-Rad	Chromium	7440-47-3	µg/kg	11,400
618-7_Shallow_4	non-Rad	Cobalt	7440-48-4	µg/kg	6,700
618-7_Shallow_4	non-Rad	Copper	7440-50-8	µg/kg	13,200
618-7_Shallow_4	non-Rad	Iron	7439-89-6	µg/kg	2.12E+07
618-7_Shallow_4	non-Rad	Lead	7439-92-1	µg/kg	3,000
618-7_Shallow_4	non-Rad	Manganese	7439-96-5	µg/kg	285,000
618-7_Shallow_4	non-Rad	Nickel	7440-02-0	µg/kg	12,900
618-7_Shallow_4	non-Rad	Tin	7440-31-5	µg/kg	710
618-7_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,064
618-7_Shallow_4	non-Rad	Vanadium	7440-62-2	µg/kg	54,800
618-7_Shallow_4	non-Rad	Zinc	7440-66-6	µg/kg	37,000
618-7_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.69
618-7_Shallow_4	Rad	Uranium-238	U-238	pCi/g	0.76
618-7_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	150
618-7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.61E+06
618-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	980
618-7_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	6.7
618-7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,200
618-7_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	92,800
618-7_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	88
618-7_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	66
618-7_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	52
618-7_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	11
618-7_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	370
618-7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	470
618-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	6,200
618-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	65,900
618-7_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	69
618-7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,000
618-7_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	25,000
618-7_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	45
618-7_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	33
618-7_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	48
618-7_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.87E+07
618-7_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,500
618-7_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	425,000
618-7_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	20
618-7_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	17,200
618-7_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	410
618-7_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,200
618-7_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	680,000
618-7_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	19,563
618-7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	80,500
618-7_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	52,400
618-7_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.010
618-7_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11
618-7_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.97
618-7_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	6.4
618-8_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,100
618-8_Shallow	non-Rad	Barium	7440-39-3	µg/kg	97,600
618-8_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	12,400
618-8_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,100
618-8_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	846
618-8_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,720
618-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.2
618-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.73
618-9_Shallow_Focused	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	110
618-9_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	680
618-9_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	390
618-9_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.57E+06
618-9_Shallow_Focused	non-Rad	Aroclor-1016	12674-11-2	µg/kg	1,900
618-9_Shallow_Focused	non-Rad	Aroclor-1221	11104-28-2	µg/kg	1,900
618-9_Shallow_Focused	non-Rad	Aroclor-1232	11141-16-5	µg/kg	1,900
618-9_Shallow_Focused	non-Rad	Aroclor-1242	53469-21-9	µg/kg	1,900
618-9_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,900
618-9_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,900
618-9_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,900

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
618-9_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	11,600
618-9_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	90,200
618-9_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	330
618-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	5,200
618-9_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	2,700
618-9_Shallow_Focused	non-Rad	Chlordane	57-74-9	µg/kg	69
618-9_Shallow_Focused	non-Rad	Chloroform	67-66-3	µg/kg	9.0
618-9_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,700
618-9_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,400
618-9_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	16,700
618-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	7,200
618-9_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	44
618-9_Shallow_Focused	non-Rad	Hexachlorobutadiene	87-68-3	µg/kg	760
618-9_Shallow_Focused	non-Rad	Hexachloroethane	67-72-1	µg/kg	17,000
618-9_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.49E+07
618-9_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	7,700
618-9_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	359,000
618-9_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	330
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300
618-9_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,600
618-9_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	1.67E+06
618-9_Shallow_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	920
618-9_Shallow_Focused	non-Rad	Toluene	108-88-3	µg/kg	9.0
618-9_Shallow_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0
618-9_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	3,100
618-9_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	59,300
618-9_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	52,300
618-9_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.071
618-9_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	3.0
628-4_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,374
628-4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	61
628-4_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,284
628-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,308
628-4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.033
628-4_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.87
628-4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.78
628-4_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	42
628-4_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,115
628-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	243
628-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	38
628-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,864
628-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	99,167
628-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,163
628-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1
628-4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.11
628-4_Shallow	Rad	Uranium-238	U-238	pCi/g	1.0
UPR-300-17_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	117
UPR-300-17_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.34E+06
UPR-300-17_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	7.0
UPR-300-17_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	359
UPR-300-17_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,970
UPR-300-17_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	450
UPR-300-17_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	113
UPR-300-17_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,573
UPR-300-17_Shallow	non-Rad	Barium	7440-39-3	µg/kg	81,014
UPR-300-17_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	59
UPR-300-17_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	44
UPR-300-17_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	33
UPR-300-17_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	9.9
UPR-300-17_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	240
UPR-300-17_Shallow	non-Rad	Boron	7440-42-8	µg/kg	3,903
UPR-300-17_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	173
UPR-300-17_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	13,795
UPR-300-17_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	39
UPR-300-17_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,688
UPR-300-17_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,135
UPR-300-17_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	35
UPR-300-17_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.9
UPR-300-17_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	5.9
UPR-300-17_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07
UPR-300-17_Shallow	non-Rad	Lead	7439-92-1	µg/kg	11,240
UPR-300-17_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	285,159
UPR-300-17_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	69
UPR-300-17_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	412
UPR-300-17_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	48
UPR-300-17_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	563,654
UPR-300-17_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	34
UPR-300-17_Shallow	non-Rad	Silver	7440-22-4	µg/kg	340
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,950
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	210,420
UPR-300-17_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,420

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
UPR-300-17_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	52,150
UPR-300-17_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	157,172
UPR-300-17_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	6.1
UPR-300-17_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.91
UPR-300-17_Shallow	Rad	Uranium-238	U-238	pCi/g	4.0
UPR-300-46_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	13
UPR-300-46_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.80E+06
UPR-300-46_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	381
UPR-300-46_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	879
UPR-300-46_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	490
UPR-300-46_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	84
UPR-300-46_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,846
UPR-300-46_Shallow	non-Rad	Barium	7440-39-3	µg/kg	82,137
UPR-300-46_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	3.9
UPR-300-46_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.4
UPR-300-46_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	5.4
UPR-300-46_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.8
UPR-300-46_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	222
UPR-300-46_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,714
UPR-300-46_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	95
UPR-300-46_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,173
UPR-300-46_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	5.6
UPR-300-46_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,361
UPR-300-46_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,151
UPR-300-46_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	1.3
UPR-300-46_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	9.6
UPR-300-46_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.2
UPR-300-46_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	7.6
UPR-300-46_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07
UPR-300-46_Shallow	non-Rad	Lead	7439-92-1	µg/kg	7,105
UPR-300-46_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	311,001
UPR-300-46_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	29
UPR-300-46_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	456
UPR-300-46_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	36
UPR-300-46_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,230
UPR-300-46_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	4.4
UPR-300-46_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,897
UPR-300-46_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	53,808
UPR-300-46_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	47,945
UPR-300-46_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.070
UPR-300-46_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.8
UPR-300-46_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24
UPR-300-46_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7

Notes:

a. ECF-300NPL-11-0137, *Computation of Exposure Point Concentrations for the 300-FF-2 Source Operable Unit.*

Table 4-5 Hanford Site Soil Background Values

Analyte Name	Analyte Class	Units	Lognormal 90th Percentile Background Value	Source of Background Values
Cesium-137	RAD	pCi/g	1.1	DOE/RL-96-12, Rev.0
Cobalt-60	RAD	pCi/g	0.0084	DOE/RL-96-12, Rev.0
Europium-154	RAD	pCi/g	0.033	DOE/RL-96-12, Rev.0
Europium-155	RAD	pCi/g	0.054	DOE/RL-96-12, Rev.0
Gross beta	RAD	pCi/g	23	DOE/RL-96-12, Rev.0
Plutonium-238	RAD	pCi/g	0.0038	DOE/RL-96-12, Rev.0
Plutonium-239/240	RAD	pCi/g	0.025	DOE/RL-96-12, Rev.0
Potassium-40	RAD	pCi/g	17	DOE/RL-96-12, Rev.0
Radium-226	RAD	pCi/g	0.82	DOE/RL-96-12, Rev.0
Radium-228	RAD	pCi/g	1.82	DOE/RL-96-12, Rev.0
Strontium-90	RAD	pCi/g	0.18	DOE/RL-96-12, Rev.0
Thorium-228	RAD	pCi/g	1.40	DOE/RL-96-12, Rev.0
Thorium-232	RAD	pCi/g	1.3	DOE/RL-96-12, Rev.0
Total beta radiostrontium	RAD	pCi/g	0.18	DOE/RL-96-12, Rev.0
Uranium-233/234	RAD	pCi/g	1.1	DOE/RL-96-12, Rev.0
Uranium-234	RAD	pCi/g	1.1	DOE/RL-96-12, Rev.0
Uranium-235	RAD	pCi/g	0.11	DOE/RL-96-12, Rev.0
Uranium-238	RAD	pCi/g	1.1	DOE/RL-96-12, Rev.0
Aluminum	METAL	µg/kg	1.18E+07	DOE/RL-92-24, V.1, Rev.4
Antimony	METAL	µg/kg	130	ECF-HANFORD-11-0038
Arsenic	METAL	µg/kg	6,470	DOE/RL-92-24, V.1, Rev.4
Barium	METAL	µg/kg	132,000	DOE/RL-92-24, V.1, Rev.4
Beryllium	METAL	µg/kg	1,510	DOE/RL-92-24, V.1, Rev.4
Cadmium	METAL	µg/kg	563	ECF-HANFORD-11-0038
Calcium	METAL	µg/kg	1.72E+07	DOE/RL-92-24, V.1, Rev.4
Chromium	METAL	µg/kg	18,500	DOE/RL-92-24, V.1, Rev.4
Cobalt	METAL	µg/kg	15,700	DOE/RL-92-24, V.1, Rev.4
Copper	METAL	µg/kg	22,000	DOE/RL-92-24, V.1, Rev.4
Iron	METAL	µg/kg	3.26E+07	DOE/RL-92-24, V.1, Rev.4
Lead	METAL	µg/kg	10,200	DOE/RL-92-24, V.1, Rev.4
Lithium	METAL	µg/kg	13300	ECF-HANFORD-11-0038
Magnesium	METAL	µg/kg	7.06E+06	DOE/RL-92-24, V.1, Rev.4
Manganese	METAL	µg/kg	512,000	DOE/RL-92-24, V.1, Rev.4
Mercury	METAL	µg/kg	13	ECF-HANFORD-11-0038
Molybdenum	METAL	µg/kg	470	ECF-HANFORD-11-0038
Nickel	METAL	µg/kg	19,100	DOE/RL-92-24, V.1, Rev.4
Potassium	METAL	µg/kg	2.15E+06	DOE/RL-92-24, V.1, Rev.4
Silver	METAL	µg/kg	167	ECF-HANFORD-11-0038
Sodium	METAL	µg/kg	690,000	DOE/RL-92-24, V.1, Rev.4
Total_U_Isotopes	METAL	µg/kg	3,210	Isotopic Activity Conversion based on DOE/RL-96-12 values
Uranium	METAL	µg/kg	3,210	Isotopic Activity Conversion based on DOE/RL-96-12 values
Vanadium	METAL	µg/kg	85,100	DOE/RL-92-24, V.1, Rev.4
Zinc	METAL	µg/kg	67,800	DOE/RL-92-24, V.1, Rev.4
Ammonia	ANIONS	µg/kg	9,230	DOE/RL-92-24, V.1, Rev.4

Table 4-5 Hanford Site Soil Background Values

Analyte Name	Analyte Class	Units	Lognormal 90th Percentile Background Value	Source of Background Values
Chloride	ANIONS	µg/kg	100,000	DOE/RL-92-24, V.1, Rev.4
Fluoride	ANIONS	µg/kg	2,810	DOE/RL-92-24, V.1, Rev.4
Nitrate	ANIONS	µg/kg	52,000	DOE/RL-92-24, V.1, Rev.4
Phosphate	ANIONS	µg/kg	785	DOE/RL-92-24, V.1, Rev.4
Sulfate	ANIONS	µg/kg	237,000	DOE/RL-92-24, V.1, Rev.4
Boron	METAL	µg/kg	3,890	ECF-HANFORD-11-0038
Selenium	METAL	µg/kg	780	ECF-HANFORD-11-0038
Thallium	METAL	µg/kg	185	ECF-HANFORD-11-0038

Notes:

DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes.*

DOE/RL-96-12, *Hanford Site Background: Part 2, Soil Background for Radionuclides.*

ECF-HANFORD-11-0038, *Soil Background Data for Interim Use at the Hanford Site.*

Table 7-1. Summary of Analytes that Exceed STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
316-2_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	210,452	101,630[b]	Yes
316-2_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	291,369	101,630[b]	Yes
316-5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	271,835	101,630[b]	Yes
316-5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	204,701	101,630[b]	Yes
316-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	138,095	101,630[b]	Yes
618-1_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	209,000	101,630[b]	Yes
618-2_Deep	non-Rad	Uranium	7440-61-1	µg/kg	501,000	101,630[b]	Yes
618-2_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	148,000	101,630[b]	Yes
618-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	238,577	101,630[b]	Yes
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	2,098	Yes
618-9_Shallow_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	920	275	Yes

Notes:

a. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd ≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

b. Due to the complex geochemistry of uranium in 300 Area source operable unit soils, uranium SSLs were derived using a site-speicific two-dimensional model as described in ECF-300FF5-11-0151.

-- = Not applicable or no value

Table 7-2. Summary of Analytes that Exceed STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	13,500	11,726	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	190	133	Yes
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	330	133	Yes
300-44_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	16,900	11,726	Yes
316-1_Shallow_1	non-Rad	Aroclor-1248	12672-29-6	µg/kg	3,000	133	Yes
316-1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	19,014	11,726	Yes
316-2_Shallow_2	non-Rad	Aroclor-1248	12672-29-6	µg/kg	697	133	Yes
618-1_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	8,940	8,451	Yes
618-9_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	390	148	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1221	11104-28-2	µg/kg	1,900	17	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1232	11141-16-5	µg/kg	1,900	17	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1242	53469-21-9	µg/kg	1,900	143	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,900	133	Yes
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	1,931	Yes
628-4_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,115	133	Yes
UPR-300-17_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,970	133	Yes
UPR-300-46_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	879	133	Yes

Notes:

a. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd ≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

-- = Not applicable or no value

Table 7-3. Summary of Analytes that Exceed STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
316-2_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	210,452	101,630[b]	Yes
316-2_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	291,369	101,630[b]	Yes
316-5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	271,835	101,630[b]	Yes
316-5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	204,701	101,630[b]	Yes
316-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	138,095	101,630[b]	Yes
618-1_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	209,000	101,630[b]	Yes
618-2_Deep	non-Rad	Uranium	7440-61-1	µg/kg	501,000	101,630[b]	Yes
618-2_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	148,000	101,630[b]	Yes
618-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	238,577	101,630[b]	Yes
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	2,098	Yes
618-9_Shallow_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	920	275	Yes

Notes:

a. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd ≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

b. Due to the complex geochemistry of uranium in 300 Area source operable unit soils, uranium SSLs were derived using a site-speicific two-dimensional model as described in ECF-300FF5-11-0151.

-- = Not applicable or no value

Table 7-4. Summary of Analytes that Exceed STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	13,500	11,726	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	190	133	Yes
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	330	133	Yes
300-44_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	16,900	11,726	Yes
316-1_Shallow_1	non-Rad	Aroclor-1248	12672-29-6	µg/kg	3,000	133	Yes
316-1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	19,014	11,726	Yes
316-2_Shallow_2	non-Rad	Aroclor-1248	12672-29-6	µg/kg	697	133	Yes
618-1_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	8,940	8,451	Yes
618-9_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	390	148	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1221	11104-28-2	µg/kg	1,900	17	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1232	11141-16-5	µg/kg	1,900	17	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1242	53469-21-9	µg/kg	1,900	143	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,900	133	Yes
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	1,931	Yes
628-4_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,115	133	Yes
UPR-300-17_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,970	133	Yes
UPR-300-46_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	879	133	Yes

Notes:

a. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd ≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

-- = Not applicable or no value

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
300 ASH PITS_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	52	91,112	No
300 ASH PITS_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,078	37,999	No
300 ASH PITS_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	96	--[b]	--
300 ASH PITS_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	76	8.41E+06	No
300 ASH PITS_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,450	101,630[c]	No
300 ASH PITS_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.039	--[d]	--
300 ASH PITS_Shallow	Rad	Uranium-238	U-238	pCi/g	0.82	--[d]	--
300 VTS_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.029	--[b]	--
300-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	13,500	37,999	No
300-10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	200	--[b]	--
300-10_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	230	8.41E+06	No
300-10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,078	101,630[c]	No
300-10_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.16	--[b]	--
300-10_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.041	--[d]	--
300-10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
300-109_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.62E+06	--[b]	--
300-109_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	122	--[b]	--
300-109_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	40	--[b]	--
300-109_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,420	37,999	No
300-109_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	63,300	--[b]	--
300-109_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.2	--[b]	--
300-109_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	2.3	--[b]	--
300-109_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	180	--[b]	--
300-109_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	632	1.08E+08	No
300-109_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	59	3.52E+06	No
300-109_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,950	--[b]	--
300-109_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	1.8	--[b]	--
300-109_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	6,420	--[b]	--
300-109_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,800	2.41E+08	No
300-109_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	14	--[b]	--
300-109_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.75E+07	1.43E+08	No
300-109_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,890	1.06E+07	No
300-109_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	278,000	--[b]	--
300-109_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	22	1.41E+06	No
300-109_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	341	2.58E+07	No
300-109_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,490	--[b]	--
300-109_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	1.6	--[b]	--
300-109_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,108	101,630[c]	No
300-109_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	47,600	--[b]	--
300-109_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	34,700	--[b]	--
300-109_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	--[d]	--
300-109_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
300-109_Staging Pile Area_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.78E+06	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	37	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	19	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,580	37,999	No
300-109_Staging Pile Area_Focused	non-Rad	Barium	7440-39-3	µg/kg	72,700	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	2.1	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.3	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.3	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	203	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,060	1.08E+08	No
300-109_Staging Pile Area_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	66	3.52E+06	No
300-109_Staging Pile Area_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,170	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,950	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Copper	7440-50-8	µg/kg	11,600	2.41E+08	No
300-109_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	5.1	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	29	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.84E+07	1.43E+08	No
300-109_Staging Pile Area_Focused	non-Rad	Lead	7439-92-1	µg/kg	5,030	1.06E+07	No
300-109_Staging Pile Area_Focused	non-Rad	Manganese	7439-96-5	µg/kg	286,000	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	408	2.58E+07	No
300-109_Staging Pile Area_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,570	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	µg/kg	7.0	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,450	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,877	101,630[c]	No
300-109_Staging Pile Area_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	45,100	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Zinc	7440-66-6	µg/kg	48,800	--[b]	--
300-109_Staging Pile Area_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	2.5	--[d]	--
300-109_Staging Pile Area_Focused	Rad	Uranium-238	U-238	pCi/g	2.3	--[d]	--
300-18_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,200	37,999	No
300-18_Shallow	non-Rad	Barium	7440-39-3	µg/kg	63,400	--[b]	--
300-18_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	650	--[b]	--
300-18_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	40	3.52E+06	No
300-18_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	6,900	--[b]	--
300-18_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,600	1.06E+07	No
300-18_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,136	101,630[c]	No
300-18_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.65	--[d]	--
300-18_Shallow	Rad	Uranium-238	U-238	pCi/g	0.41	--[d]	--
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	120,000	2.00E+06[e]	No
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	230,000	2.00E+06[e]	No
300-23_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	52,000	2.00E+06[e]	No
300-259_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	5.99E+06	--[b]	--

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
300-259_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	322	270,034	No
300-259_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,096	37,999	No
300-259_Shallow	non-Rad	Barium	7440-39-3	µg/kg	75,232	--[b]	--
300-259_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	226	--[b]	--
300-259_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,303	1.08E+08	No
300-259_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	252	3.52E+06	No
300-259_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,901	--[b]	--
300-259_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	5,831	--[b]	--
300-259_Shallow	non-Rad	Copper	7440-50-8	µg/kg	10,692	2.41E+08	No
300-259_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	1.43E+08	No
300-259_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,625	1.06E+07	No
300-259_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	318,874	--[b]	--
300-259_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	10	1.41E+06	No
300-259_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	303	2.58E+07	No
300-259_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,751	--[b]	--
300-259_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,876	101,630[c]	No
300-259_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	42,626	--[b]	--
300-259_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	479,584	--[b]	--
300-259_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.6	--[d]	--
300-259_Shallow	Rad	Uranium-238	U-238	pCi/g	1.3	--[d]	--
300-260_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.17E+06	--[b]	--
300-260_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	922	270,034	No
300-260_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,160	37,999	No
300-260_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	122,000	--[b]	--
300-260_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	239	--[b]	--
300-260_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	8,360	1.08E+08	No
300-260_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	110	3.52E+06	No
300-260_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,890	--[b]	--
300-260_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,430	--[b]	--
300-260_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	73,300	2.41E+08	No
300-260_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.04E+07	1.43E+08	No
300-260_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	18,300	1.06E+07	No
300-260_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	328,000	--[b]	--
300-260_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	12	1.41E+06	No
300-260_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	537	2.58E+07	No
300-260_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,200	--[b]	--
300-260_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	206	--[b]	--
300-260_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,800	101,630[c]	No
300-260_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	59,000	--[b]	--
300-260_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	77,400	--[b]	--
300-260_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.25	--[d]	--
300-260_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	4.3	--[d]	--
300-272_Overburden_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	13,100	2.00E+06[e]	No
300-272_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	43,100	2.00E+06[e]	No
300-275_Shallow_1	non-Rad	Acenaphthene	83-32-9	µg/kg	960	7.38E+07	No
300-275_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	5.61E+06	--[b]	--
300-275_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	260	270,034	No
300-275_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	2,211	37,999	No
300-275_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	75,261	--[b]	--
300-275_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.3	--[b]	--
300-275_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.9	--[b]	--
300-275_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	452	--[b]	--
300-275_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	1,466	1.08E+08	No
300-275_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	83	3.52E+06	No
300-275_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	8,022	--[b]	--
300-275_Shallow_1	non-Rad	Chrysene	218-01-9	µg/kg	2.2	--[b]	--
300-275_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	5,847	--[b]	--
300-275_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	42,923	2.41E+08	No
300-275_Shallow_1	non-Rad	Fluoranthene	206-44-0	µg/kg	2,300	--[b]	--
300-275_Shallow_1	non-Rad	Fluorene	86-73-7	µg/kg	81	6.17E+07	No
300-275_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	1.79E+07	1.43E+08	No
300-275_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	7,189	1.06E+07	No
300-275_Shallow_1	non-Rad	Lithium	7439-93-2	µg/kg	6,686	--[b]	--
300-275_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	276,815	--[b]	--
300-275_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	17	1.41E+06	No
300-275_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	378	2.58E+07	No
300-275_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	9,461	--[b]	--
300-275_Shallow_1	non-Rad	Silver	7440-22-4	µg/kg	121	--[b]	--
300-275_Shallow_1	non-Rad	Strontium	7440-24-6	µg/kg	20,196	--[b]	--
300-275_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,483	--[b]	--
300-275_Shallow_1	non-Rad	Uranium	7440-61-1	µg/kg	2,500	101,630[c]	No
300-275_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	45,128	--[b]	--
300-275_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	41,014	--[b]	--
300-275_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.046	--[b]	--
300-275_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	7.7	--[d]	--
300-275_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.0	--[d]	--
300-275_Shallow_1	Rad	Uranium-238	U-238	pCi/g	7.4	--[d]	--
300-275_Shallow_2	non-Rad	Acenaphthene	83-32-9	µg/kg	3.6	7.38E+07	No
300-275_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	6.24E+06	--[b]	--
300-275_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,761	37,999	No
300-275_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	68,607	--[b]	--
300-275_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	254	--[b]	--
300-275_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	1,147	1.08E+08	No
300-275_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	144	3.52E+06	No

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
300-275_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	8,994	--[b]	--
300-275_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	5,977	--[b]	--
300-275_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	11,596	2.41E+08	No
300-275_Shallow_2	non-Rad	Fluoranthene	206-44-0	µg/kg	56	--[b]	--
300-275_Shallow_2	non-Rad	Fluorene	86-73-7	µg/kg	2.6	6.17E+07	No
300-275_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	1.43E+08	No
300-275_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	4,099	1.06E+07	No
300-275_Shallow_2	non-Rad	Lithium	7439-93-2	µg/kg	7,067	--[b]	--
300-275_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	292,731	--[b]	--
300-275_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	28	1.41E+06	No
300-275_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	404	2.58E+07	No
300-275_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	9,593	--[b]	--
300-275_Shallow_2	non-Rad	Strontium	7440-24-6	µg/kg	27,081	--[b]	--
300-275_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,149	--[b]	--
300-275_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,725	101,630[c]	No
300-275_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	51,632	--[b]	--
300-275_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	41,245	--[b]	--
300-275_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
300-275_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
300-275_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.2	--[d]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.32E+06	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1016	12674-11-2	µg/kg	10	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	16	97,738	No
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	190	91,112	No
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	84	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	17	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,638	37,999	No
300-33, 300-41, 300-256_Shallow	non-Rad	Barium	7440-39-3	µg/kg	72,411	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	256	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,484	1.08E+08	No
300-33, 300-41, 300-256_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	228	8.41E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	94	3.52E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	8,781	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,273	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,662	2.41E+08	No
300-33, 300-41, 300-256_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	1,651	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.00E+07	1.43E+08	No
300-33, 300-41, 300-256_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,268	1.06E+07	No
300-33, 300-41, 300-256_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	5,495	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	314,762	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	16	1.41E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	2.9	2,098	No
300-33, 300-41, 300-256_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	486	2.58E+07	No
300-33, 300-41, 300-256_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,880	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	8,617	1.36E+07	No
300-33, 300-41, 300-256_Shallow	non-Rad	Silver	7440-22-4	µg/kg	782	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	7,260	101,630[c]	No
300-33, 300-41, 300-256_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	52,694	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,462	--[b]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.1	--[d]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.34	--[d]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-238	U-238	pCi/g	2.1	--[d]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.51E+06	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	330	91,112	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	385	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,240	37,999	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	64,600	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	169	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,030	1.08E+08	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	100	3.52E+06	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,080	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,640	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,400	2.41E+08	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	1,300	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.86E+07	1.43E+08	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	3,160	1.06E+07	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Lithium	7439-93-2	µg/kg	6,580	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	259,000	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2.2	2,098	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	275	2.58E+07	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,040	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	17,900	1.36E+07	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,460	101,630[c]	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	51,400	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	38,900	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	3.0	--[d]	--
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	2.2	--[d]	--
300-37_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	100	--[b]	--
300-37_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,200	--[b]	--
300-44_Overburden_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	9,100	37,999	No
300-44_Overburden_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,027	101,630[c]	No
300-44_Overburden_Focused	Rad	Uranium-238	U-238	pCi/g	0.35	--[d]	--
300-44_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.71E+06	--[b]	--

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
300-44_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	4,100	270,034	No
300-44_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	16,900	37,999	No
300-44_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	75,200	--[b]	--
300-44_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	480	--[b]	--
300-44_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,300	--[b]	--
300-44_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,200	--[b]	--
300-44_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	7,800	2.41E+08	No
300-44_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.94E+07	1.43E+08	No
300-44_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	303,000	--[b]	--
300-44_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,600	--[b]	--
300-44_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	872	101,630[c]	No
300-44_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	43,200	--[b]	--
300-44_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	37,800	--[b]	--
300-44_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.29	--[d]	--
300-45_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	86	--[b]	--
300-45_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	290	--[b]	--
300-45_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,600	101,630[c]	No
300-45_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.023	--[b]	--
300-45_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.061	--[d]	--
300-45_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2	--[d]	--
300-49_Overburden	non-Rad	1,2,4-Trichlorobenzene	120-82-1	µg/kg	31	28,655	No
300-49_Overburden	non-Rad	1,4-Dichlorobenzene	106-46-7	µg/kg	29	61,744	No
300-49_Overburden	non-Rad	2,4-Dinitrotoluene	121-14-2	µg/kg	19	402	No
300-49_Overburden	non-Rad	2-Chlorophenol	95-57-8	µg/kg	51	194,372	No
300-49_Overburden	non-Rad	4-Chloro-3-methylphenol	59-50-7	µg/kg	46	9.78E+06	No
300-49_Overburden	non-Rad	Acenaphthene	83-32-9	µg/kg	31	7.38E+07	No
300-49_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.30E+06	--[b]	--
300-49_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	232	270,034	No
300-49_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,008	--[b]	--
300-49_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,291	37,999	No
300-49_Overburden	non-Rad	Barium	7440-39-3	µg/kg	76,068	--[b]	--
300-49_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	201	--[b]	--
300-49_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	174	3.52E+06	No
300-49_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	18,106	--[b]	--
300-49_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,127	--[b]	--
300-49_Overburden	non-Rad	Copper	7440-50-8	µg/kg	536,000	2.41E+08	No
300-49_Overburden	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	52	2.85E+07	No
300-49_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.08E+07	1.43E+08	No
300-49_Overburden	non-Rad	Lead	7439-92-1	µg/kg	36,964	1.06E+07	No
300-49_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	316,669	--[b]	--
300-49_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	13,035	--[b]	--
300-49_Overburden	non-Rad	n-Nitrosodi-n-dipropylamine	621-64-7	µg/kg	40	330	No
300-49_Overburden	non-Rad	Pentachlorophenol	87-86-5	µg/kg	50	5,346	No
300-49_Overburden	non-Rad	Phenol	108-95-2	µg/kg	50	1.49E+06	No
300-49_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	40	--[b]	--
300-49_Overburden	non-Rad	Silver	7440-22-4	µg/kg	703	--[b]	--
300-49_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,066	101,630[c]	No
300-49_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	50,380	--[b]	--
300-49_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	141,984	--[b]	--
300-49_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	1.0	--[d]	--
300-49_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.057	--[d]	--
300-49_Overburden	Rad	Uranium-238	U-238	pCi/g	1.0	--[d]	--
300-49_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.92E+06	--[b]	--
300-49_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	176	270,034	No
300-49_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,431	37,999	No
300-49_Shallow	non-Rad	Barium	7440-39-3	µg/kg	89,874	--[b]	--
300-49_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	303	--[b]	--
300-49_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,170	--[b]	--
300-49_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,323	--[b]	--
300-49_Shallow	non-Rad	Copper	7440-50-8	µg/kg	14,870	2.41E+08	No
300-49_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.59E+07	1.43E+08	No
300-49_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,629	1.06E+07	No
300-49_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	361,805	--[b]	--
300-49_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	10,664	--[b]	--
300-49_Shallow	non-Rad	Silver	7440-22-4	µg/kg	621	--[b]	--
300-49_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,983	101,630[c]	No
300-49_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	58,672	--[b]	--
300-49_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	54,651	--[b]	--
300-49_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.15	--[b]	--
300-49_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
300-49_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
300-49_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
300-50_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.68E+06	--[b]	--
300-50_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	33	--[b]	--
300-50_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	229	--[b]	--
300-50_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	6,897	37,999	No
300-50_Overburden	non-Rad	Barium	7440-39-3	µg/kg	117,742	--[b]	--
300-50_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	325	--[b]	--
300-50_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	563	3.52E+06	No
300-50_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	12,197	--[b]	--
300-50_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	9,389	--[b]	--
300-50_Overburden	non-Rad	Copper	7440-50-8	µg/kg	64,527	2.41E+08	No
300-50_Overburden	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07	1.43E+08	No
300-50_Overburden	non-Rad	Lead	7439-92-1	µg/kg	5,905	1.06E+07	No

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
300-50_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	314,271	--[b]	--
300-50_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	15,229	--[b]	--
300-50_Overburden	non-Rad	Silver	7440-22-4	µg/kg	1,202	--[b]	--
300-50_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	17,919	101,630[c]	No
300-50_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	45,243	--[b]	--
300-50_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	45,889	--[b]	--
300-50_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.056	--[b]	--
300-50_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	6.0	--[d]	--
300-50_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.45	--[d]	--
300-50_Overburden	Rad	Uranium-238	U-238	pCi/g	6.0	--[d]	--
300-50_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.88E+06	--[b]	--
300-50_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	3,000	270,034	No
300-50_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	126	--[b]	--
300-50_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,403	37,999	No
300-50_Shallow	non-Rad	Barium	7440-39-3	µg/kg	103,029	--[b]	--
300-50_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	282	--[b]	--
300-50_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	19	--[b]	--
300-50_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	463	3.52E+06	No
300-50_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	16,841	--[b]	--
300-50_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,109	--[b]	--
300-50_Shallow	non-Rad	Copper	7440-50-8	µg/kg	16,820	2.41E+08	No
300-50_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	1.43E+08	No
300-50_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,381	1.06E+07	No
300-50_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	318,120	--[b]	--
300-50_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,413	--[b]	--
300-50_Shallow	non-Rad	Silver	7440-22-4	µg/kg	2,992	--[b]	--
300-50_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	22,938	101,630[c]	No
300-50_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	46,964	--[b]	--
300-50_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,344	--[b]	--
300-50_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.056	--[b]	--
300-50_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	7.9	--[d]	--
300-50_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.66	--[d]	--
300-50_Shallow	Rad	Uranium-238	U-238	pCi/g	8.4	--[d]	--
300-8_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	574	--[b]	--
300-8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,374	101,630[c]	No
300-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.79	--[d]	--
300-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.82	--[d]	--
316-1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	40,572	101,630[c]	No
316-1_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.10	--[b]	--
316-1_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.32	--[b]	--
316-1_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	13	--[d]	--
316-1_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
316-1_Overburden	Rad	Uranium-238	U-238	pCi/g	13	--[d]	--
316-1_Shallow_1	non-Rad	Aroclor-1248	12672-29-6	µg/kg	3,000	91,112	No
316-1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	19,014	37,999	No
316-1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	69	--[b]	--
316-1_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	98	8.41E+06	No
316-1_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	83,027	101,630[c]	No
316-1_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.032	--[b]	--
316-1_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.2	--[d]	--
316-1_Shallow_1	Rad	Uranium-238	U-238	pCi/g	28	--[d]	--
316-1_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	1.11E+07	--[b]	--
316-1_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	490	270,034	No
316-1_Shallow_3	non-Rad	Aroclor-1254	11097-69-1	µg/kg	98	--[b]	--
316-1_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	5,138	37,999	No
316-1_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	129,106	--[b]	--
316-1_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	416	--[b]	--
316-1_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	342	--[b]	--
316-1_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	474	3.52E+06	No
316-1_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	50,455	--[b]	--
316-1_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	9,703	--[b]	--
316-1_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	1.37E+06	2.41E+08	No
316-1_Shallow_3	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	3.2	--[b]	--
316-1_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.44E+07	1.43E+08	No
316-1_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	14,409	1.06E+07	No
316-1_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	392,825	--[b]	--
316-1_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	1,105	1.41E+06	No
316-1_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	94,656	--[b]	--
316-1_Shallow_3	non-Rad	Phenol	108-95-2	µg/kg	28	1.49E+06	No
316-1_Shallow_3	non-Rad	Selenium	7782-49-2	µg/kg	1,444	3.02E+06	No
316-1_Shallow_3	non-Rad	Silver	7440-22-4	µg/kg	13,196	--[b]	--
316-1_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	63,074	101,630[c]	No
316-1_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	56,707	--[b]	--
316-1_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	82,016	--[b]	--
316-1_Shallow_3	Rad	Cesium-137	10045-97-3	pCi/g	0.37	--[b]	--
316-1_Shallow_3	Rad	Cobalt-60	10198-40-0	pCi/g	2.3	--[b]	--
316-1_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	23	--[d]	--
316-1_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	2.6	--[d]	--
316-1_Shallow_3	Rad	Uranium-238	U-238	pCi/g	21	--[d]	--
316-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	µg/kg	62	--[b]	--
316-1_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	42,963	101,630[c]	No
316-1_Shallow_4	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
316-1_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	16	--[d]	--
316-1_Shallow_4	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
316-1_Shallow_4	Rad	Uranium-238	U-238	pCi/g	14	--[d]	--
316-2_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	210,452	101,630[c]	Yes
316-2_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.031	--[b]	--
316-2_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.092	--[b]	--
316-2_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	86	--[d]	--
316-2_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	12	--[d]	--
316-2_Shallow_1	Rad	Uranium-238	U-238	pCi/g	69	--[d]	--
316-2_Shallow_2	non-Rad	Aroclor-1248	12672-29-6	µg/kg	697	91,112	No
316-2_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	µg/kg	42	--[b]	--
316-2_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	110	--[b]	--
316-2_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	291,369	101,630[c]	Yes
316-2_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	0.45	--[b]	--
316-2_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.45	--[b]	--
316-2_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	115	--[d]	--
316-2_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	11	--[d]	--
316-2_Shallow_2	Rad	Uranium-238	U-238	pCi/g	96	--[d]	--
316-2_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	8,000	37,999	No
316-2_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	260	--[b]	--
316-2_Shallow_3	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	180	8.41E+06	No
316-2_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	73,174	101,630[c]	No
316-2_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.91	--[d]	--
316-2_Shallow_3	Rad	Uranium-238	U-238	pCi/g	24	--[d]	--
316-5_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	3,070	37,999	No
316-5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	38	--[b]	--
316-5_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	146	--[b]	--
316-5_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	100	8.41E+06	No
316-5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	271,835	101,630[c]	Yes
316-5_Shallow_1	Rad	Americium-241	14596-10-2	pCi/g	0.48	--[b]	--
316-5_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	2.3	--[b]	--
316-5_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	19	--[d]	--
316-5_Shallow_1	Rad	Uranium-238	U-238	pCi/g	89	--[d]	--
316-5_Shallow_2	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	140	270	No
316-5_Shallow_2	non-Rad	2-Butoxyethanol	111-76-2	µg/kg	240	251,308	No
316-5_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	3,180	37,999	No
316-5_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	76,700	--[b]	--
316-5_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	180	--[b]	--
316-5_Shallow_2	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	110	8.41E+06	No
316-5_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	6,900	--[b]	--
316-5_Shallow_2	non-Rad	Chrysene	218-01-9	µg/kg	38	--[b]	--
316-5_Shallow_2	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	146	2.85E+07	No
316-5_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	3,200	1.06E+07	No
316-5_Shallow_2	non-Rad	Selenium	7782-49-2	µg/kg	490	3.02E+06	No
316-5_Shallow_2	non-Rad	Silver	7440-22-4	µg/kg	3,600	--[b]	--
316-5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	204,701	101,630[c]	Yes
316-5_Shallow_2	Rad	Americium-241	14596-10-2	pCi/g	0.12	--[b]	--
316-5_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	1.7	--[b]	--
316-5_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--
316-5_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	9.0	--[d]	--
316-5_Shallow_2	Rad	Uranium-238	U-238	pCi/g	68	--[d]	--
316-5_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	57	91,112	No
316-5_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	70	--[b]	--
316-5_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--[b]	--
316-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,300	37,999	No
316-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	190	--[b]	--
316-5_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	1,500	2.85E+07	No
316-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	138,095	101,630[c]	Yes
316-5_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.8	--[b]	--
316-5_Shallow_Focused	Rad	Europium-155	14391-16-3	pCi/g	0.072	--[b]	--
316-5_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	7.7	--[d]	--
316-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	45	--[d]	--
331 LSLDF_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	25	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	590	2.23E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	0.56	7,793	No
331 LSLDF_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	µg/kg	0.39	285	No
331 LSLDF_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.90E+06	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	360	270,034	No
331 LSLDF_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	850	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,400	37,999	No
331 LSLDF_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	78,600	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	570	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	910	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,700	1.08E+08	No
331 LSLDF_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	340	8.41E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	140	3.52E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,300	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,400	2.41E+08	No
331 LSLDF_Shallow_Focused	non-Rad	Dieldrin	60-57-1	µg/kg	13	2,733	No
331 LSLDF_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	98	2.85E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan I	959-98-8	µg/kg	1.9	2.46E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	µg/kg	3.1	2.46E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.20E+07	1.43E+08	No

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
331 LSLDF_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	9,000	1.06E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	349,000	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	110	1.41E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	µg/kg	3.3	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	11	2,098	No
331 LSLDF_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	590	2.58E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	41,700	1.36E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	9,500	3.03E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,100	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	2,300	101,630[c]	No
331 LSLDF_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	53,100	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	137,000	--[b]	--
331 LSLDF_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	--[d]	--
331 LSLDF_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.47	--[d]	--
600-243_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	µg/kg	279	1.07E+06	No
600-243_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	31	--[b]	--
600-243_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	1,300	270,034	No
600-243_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	27	--[b]	--
600-243_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	18	--[b]	--
600-243_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,159	37,999	No
600-243_Shallow	non-Rad	Barium	7440-39-3	µg/kg	292,072	--[b]	--
600-243_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	43	--[b]	--
600-243_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	43	--[b]	--
600-243_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	46	--[b]	--
600-243_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	32	--[b]	--
600-243_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	2,079	--[b]	--
600-243_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	432	--[b]	--
600-243_Shallow	non-Rad	Boron	7440-42-8	µg/kg	294,463	1.08E+08	No
600-243_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	793	3.52E+06	No
600-243_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	18,006	--[b]	--
600-243_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	63	--[b]	--
600-243_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,207	--[b]	--
600-243_Shallow	non-Rad	Copper	7440-50-8	µg/kg	53,981	2.41E+08	No
600-243_Shallow	non-Rad	Dibenzofuran	132-64-9	µg/kg	78	2.32E+06	No
600-243_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	37	2.85E+07	No
600-243_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	79	--[b]	--
600-243_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	28	--[b]	--
600-243_Shallow	non-Rad	Lead	7439-92-1	µg/kg	40,139	1.06E+07	No
600-243_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	208,289	--[b]	--
600-243_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	1,869	2.58E+07	No
600-243_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	204	2.26E+06	No
600-243_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	21,395	--[b]	--
600-243_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	70	--[b]	--
600-243_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	5,709	3.02E+06	No
600-243_Shallow	non-Rad	Silver	7440-22-4	µg/kg	500	--[b]	--
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	95,319	2.00E+06[e]	No
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	334,524	2.00E+06[e]	No
600-243_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	46,986	--[b]	--
600-243_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	84,099	--[b]	--
600-259_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.034	--[b]	--
600-259_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.068	--[b]	--
600-259_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.038	--[b]	--
600-47_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,300	37,999	No
600-47_Shallow	non-Rad	Barium	7440-39-3	µg/kg	67,000	--[b]	--
600-47_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	500	--[b]	--
600-47_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	90	3.52E+06	No
600-47_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	5,500	--[b]	--
600-47_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,500	1.06E+07	No
600-47_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,303	101,630[c]	No
600-47_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	--[d]	--
600-47_Shallow	Rad	Uranium-238	U-238	pCi/g	1.6	--[d]	--
618-1_Deep	non-Rad	Aluminum	7429-90-5	µg/kg	6.37E+06	--[b]	--
618-1_Deep	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,760	--[b]	--
618-1_Deep	non-Rad	Aroclor-1260	11096-82-5	µg/kg	294	--[b]	--
618-1_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,550	37,999	No
618-1_Deep	non-Rad	Barium	7440-39-3	µg/kg	299,000	--[b]	--
618-1_Deep	non-Rad	Beryllium	7440-41-7	µg/kg	218	--[b]	--
618-1_Deep	non-Rad	Boron	7440-42-8	µg/kg	1,360	1.08E+08	No
618-1_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	263	3.52E+06	No
618-1_Deep	non-Rad	Chromium	7440-47-3	µg/kg	7,740	--[b]	--
618-1_Deep	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	--[b]	--
618-1_Deep	non-Rad	Copper	7440-50-8	µg/kg	46,300	2.41E+08	No
618-1_Deep	non-Rad	Fluoride	16984-48-8	µg/kg	2,800	--[b]	--
618-1_Deep	non-Rad	Iron	7439-89-6	µg/kg	2.47E+07	1.43E+08	No
618-1_Deep	non-Rad	Lead	7439-92-1	µg/kg	58,400	1.06E+07	No
618-1_Deep	non-Rad	Lithium	7439-93-2	µg/kg	5,980	--[b]	--
618-1_Deep	non-Rad	Manganese	7439-96-5	µg/kg	352,000	--[b]	--
618-1_Deep	non-Rad	Mercury	7439-97-6	µg/kg	1,180	1.41E+06	No
618-1_Deep	non-Rad	Molybdenum	7439-98-7	µg/kg	493	2.58E+07	No
618-1_Deep	non-Rad	Nickel	7440-02-0	µg/kg	17,600	--[b]	--
618-1_Deep	non-Rad	Nitrate	14797-55-8	µg/kg	1,700	1.36E+07	No
618-1_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	220	3.03E+06	No
618-1_Deep	non-Rad	Uranium	7440-61-1	µg/kg	37,400	101,630[c]	No

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-1_Deep	non-Rad	Vanadium	7440-62-2	µg/kg	73,000	--[b]	--
618-1_Deep	non-Rad	Zinc	7440-66-6	µg/kg	134,000	--[b]	--
618-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.46	--[b]	--
618-1_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	33	--[d]	--
618-1_Deep	Rad	Uranium-235	15117-96-1	pCi/g	2.7	--[d]	--
618-1_Deep	Rad	Uranium-238	U-238	pCi/g	32	--[d]	--
618-1_Deep_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.57E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	407	270,034	No
618-1_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1.24E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	99	--[b]	--
618-1_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,580	37,999	No
618-1_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	1.87E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	323	--[b]	--
618-1_Deep_Focused	non-Rad	Boron	7440-42-8	µg/kg	6,620	1.08E+08	No
618-1_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,030	3.52E+06	No
618-1_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	18,900	--[b]	--
618-1_Deep_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,920	--[b]	--
618-1_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	68,700	2.41E+08	No
618-1_Deep_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	3,300	--[b]	--
618-1_Deep_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.41E+07	1.43E+08	No
618-1_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	333,000	1.06E+07	No
618-1_Deep_Focused	non-Rad	Lithium	7439-93-2	µg/kg	8,450	--[b]	--
618-1_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	351,000	--[b]	--
618-1_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	8,940	1.41E+06	No
618-1_Deep_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	2,140	2.58E+07	No
618-1_Deep_Focused	non-Rad	Nickel	7440-02-0	µg/kg	13,700	--[b]	--
618-1_Deep_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	11,900	1.36E+07	No
618-1_Deep_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,560	3.03E+06	No
618-1_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,290	--[b]	--
618-1_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	209,000	101,630[c]	Yes
618-1_Deep_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	70,900	--[b]	--
618-1_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	82,000	--[b]	--
618-1_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	6.5	--[b]	--
618-1_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	70	--[d]	--
618-1_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.5	--[d]	--
618-1_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	65	--[d]	--
618-1_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.21E+06	--[b]	--
618-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	264	--[b]	--
618-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	54	--[b]	--
618-1_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,280	37,999	No
618-1_Shallow	non-Rad	Barium	7440-39-3	µg/kg	97,200	--[b]	--
618-1_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	188	--[b]	--
618-1_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,190	1.08E+08	No
618-1_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	68	3.52E+06	No
618-1_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,930	--[b]	--
618-1_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,360	--[b]	--
618-1_Shallow	non-Rad	Copper	7440-50-8	µg/kg	11,400	2.41E+08	No
618-1_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	400	--[b]	--
618-1_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07	1.43E+08	No
618-1_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,100	1.06E+07	No
618-1_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	6,380	--[b]	--
618-1_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	300,000	--[b]	--
618-1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	31	1.41E+06	No
618-1_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	336	2.58E+07	No
618-1_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,150	--[b]	--
618-1_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	1,600	1.36E+07	No
618-1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	300	3.03E+06	No
618-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,224	101,630[c]	No
618-1_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	56,300	--[b]	--
618-1_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	42,100	--[b]	--
618-1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	--[d]	--
618-1_Shallow	Rad	Uranium-238	U-238	pCi/g	1.5	--[d]	--
618-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	1.22E+07	--[b]	--
618-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	455	270,034	No
618-1_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	35	91,112	No
618-1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	981	--[b]	--
618-1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	56	--[b]	--
618-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	6,090	37,999	No
618-1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	102,000	--[b]	--
618-1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	371	--[b]	--
618-1_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	3,740	1.08E+08	No
618-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	266	3.52E+06	No
618-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	19,500	--[b]	--
618-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	--[b]	--
618-1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	23,800	2.41E+08	No
618-1_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	900	--[b]	--
618-1_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.28E+07	1.43E+08	No
618-1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,210	1.06E+07	No
618-1_Shallow_Focused	non-Rad	Lithium	7439-93-2	µg/kg	13,300	--[b]	--
618-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	403,000	--[b]	--
618-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	198	1.41E+06	No
618-1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	356	2.58E+07	No
618-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	16,800	--[b]	--
618-1_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	3,800	1.36E+07	No

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	260	3.03E+06	No
618-1_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,120	--[b]	--
618-1_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	7,080	101,630[c]	No
618-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	64,700	--[b]	--
618-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	68,100	--[b]	--
618-1_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-1_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.99	--[d]	--
618-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	8.2	--[d]	--
618-12_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	8,557	37,999	No
618-12_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	63	--[b]	--
618-12_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	60	8.41E+06	No
618-12_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	32,092	101,630[c]	No
618-12_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.47	--[d]	--
618-12_Shallow	Rad	Uranium-238	U-238	pCi/g	11	--[d]	--
618-13_Shallow	non-Rad	Acetone	67-64-1	µg/kg	8.6	2.23E+06	No
618-13_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.34E+06	--[b]	--
618-13_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	312	270,034	No
618-13_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,500	37,999	No
618-13_Shallow	non-Rad	Barium	7440-39-3	µg/kg	74,000	--[b]	--
618-13_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	212	--[b]	--
618-13_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,050	1.08E+08	No
618-13_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	63	3.52E+06	No
618-13_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,700	--[b]	--
618-13_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,290	--[b]	--
618-13_Shallow	non-Rad	Copper	7440-50-8	µg/kg	11,500	2.41E+08	No
618-13_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.01E+07	1.43E+08	No
618-13_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,620	1.06E+07	No
618-13_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	344,000	--[b]	--
618-13_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	5.1	2,098	No
618-13_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	420	2.58E+07	No
618-13_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,400	--[b]	--
618-13_Shallow	non-Rad	Tin	7440-31-5	µg/kg	1,050	--[b]	--
618-13_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,750	101,630[c]	No
618-13_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	55,800	--[b]	--
618-13_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,400	--[b]	--
618-13_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.038	--[b]	--
618-13_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	--[d]	--
618-13_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
618-13_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	5.9	2.23E+06	No
618-13_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.22E+06	--[b]	--
618-13_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	233	270,034	No
618-13_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,390	37,999	No
618-13_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	57,700	--[b]	--
618-13_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	184	--[b]	--
618-13_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	960	1.08E+08	No
618-13_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	47	3.52E+06	No
618-13_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,740	--[b]	--
618-13_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,710	--[b]	--
618-13_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,100	2.41E+08	No
618-13_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	150	6,000[f]	No
618-13_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.79E+07	1.43E+08	No
618-13_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	4,940	1.06E+07	No
618-13_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	268,000	--[b]	--
618-13_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	5.0	2,098	No
618-13_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	297	2.58E+07	No
618-13_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000	--[b]	--
618-13_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	745	--[b]	--
618-13_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	1,500	101,630[c]	No
618-13_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	48,600	--[b]	--
618-13_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	37,100	--[b]	--
618-13_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
618-13_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.96	--[d]	--
618-2_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	1,500	37,999	No
618-2_Deep	non-Rad	Barium	7440-39-3	µg/kg	83,300	--[b]	--
618-2_Deep	non-Rad	Chromium	7440-47-3	µg/kg	6,700	--[b]	--
618-2_Deep	non-Rad	Lead	7439-92-1	µg/kg	6,600	1.06E+07	No
618-2_Deep	non-Rad	Selenium	7782-49-2	µg/kg	780	3.02E+06	No
618-2_Deep	non-Rad	Tin	7440-31-5	µg/kg	2,900	--[b]	--
618-2_Deep	non-Rad	Uranium	7440-61-1	µg/kg	501,000	101,630[c]	Yes
618-2_Deep	Rad	Americium-241	14596-10-2	pCi/g	7.9	--[b]	--
618-2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	1.0	--[b]	--
618-2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	1.5	--[b]	--
618-2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	91	--[b]	--
618-2_Deep	Rad	Plutonium-241	14119-32-5	pCi/g	42	--[b]	--
618-2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	12	227,428	No
618-2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	161	--[d]	--
618-2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.78	--[d]	--
618-2_Deep	Rad	Uranium-238	U-238	pCi/g	165	--[d]	--
618-2_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	6.9	--[b]	--
618-2_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,300	37,999	No
618-2_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	109,000	--[b]	--
618-2_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	27	--[b]	--
618-2_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	200	3.52E+06	No
618-2_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,400	--[b]	--

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-2_Deep_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	18	2.85E+07	No
618-2_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,800	1.06E+07	No
618-2_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	1,200	3.02E+06	No
618-2_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	600	--[b]	--
618-2_Deep_Focused	non-Rad	Tin	7440-31-5	µg/kg	42,500	--[b]	--
618-2_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	148,000	101,630[c]	Yes
618-2_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	9.2	--[b]	--
618-2_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.1	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-238	13981-16-3	pCi/g	1.6	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	92	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-241	14119-32-5	pCi/g	33	--[b]	--
618-2_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	7.2	227,428	No
618-2_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	48	--[d]	--
618-2_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	2.4	--[d]	--
618-2_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	50	--[d]	--
618-2_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	37,999	No
618-2_Overburden	non-Rad	Barium	7440-39-3	µg/kg	74,700	--[b]	--
618-2_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	6,600	--[b]	--
618-2_Overburden	non-Rad	Lead	7439-92-1	µg/kg	4,300	1.06E+07	No
618-2_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	1,000	3.02E+06	No
618-2_Overburden	non-Rad	Tin	7440-31-5	µg/kg	2,700	--[b]	--
618-2_Overburden	non-Rad	Uranium	7440-61-1	µg/kg	1,140	101,630[c]	No
618-2_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.058	--[b]	--
618-2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.64	--[d]	--
618-2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.59	--[d]	--
618-2_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	1,900	37,999	No
618-2_Shallow	non-Rad	Barium	7440-39-3	µg/kg	79,100	--[b]	--
618-2_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,100	--[b]	--
618-2_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,600	1.06E+07	No
618-2_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	760	3.02E+06	No
618-2_Shallow	non-Rad	Tin	7440-31-5	µg/kg	2,400	--[b]	--
618-2_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	4,530	101,630[c]	No
618-2_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.81	--[b]	--
618-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.2	--[b]	--
618-2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	7.7	--[b]	--
618-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.2	--[d]	--
618-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.21	--[d]	--
618-2_Shallow	Rad	Uranium-238	U-238	pCi/g	2.2	--[d]	--
618-2_Staging Pile	non-Rad	Arsenic	7440-38-2	µg/kg	3,063	37,999	No
618-2_Staging Pile	non-Rad	Barium	7440-39-3	µg/kg	67,690	--[b]	--
618-2_Staging Pile	non-Rad	Chromium	7440-47-3	µg/kg	6,424	--[b]	--
618-2_Staging Pile	non-Rad	Lead	7439-92-1	µg/kg	4,011	1.06E+07	No
618-2_Staging Pile	non-Rad	Uranium	7440-61-1	µg/kg	5,022	101,630[c]	No
618-2_Staging Pile	Rad	Americium-241	14596-10-2	pCi/g	0.82	--[b]	--
618-2_Staging Pile	Rad	Cesium-137	10045-97-3	pCi/g	0.095	--[b]	--
618-2_Staging Pile	Rad	Plutonium-239/240	PU-239/240	pCi/g	10	--[b]	--
618-2_Staging Pile	Rad	Tritium	10028-17-8	pCi/g	2.3	9,176	No
618-2_Staging Pile	Rad	Uranium-233/234	U-233/234	pCi/g	2.0	--[d]	--
618-2_Staging Pile	Rad	Uranium-235	15117-96-1	pCi/g	0.12	--[d]	--
618-2_Staging Pile	Rad	Uranium-238	U-238	pCi/g	2.0	--[d]	--
618-3_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,800	37,999	No
618-3_Shallow	non-Rad	Barium	7440-39-3	µg/kg	76,500	--[b]	--
618-3_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,700	--[b]	--
618-3_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,900	1.06E+07	No
618-3_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	659	3.02E+06	No
618-3_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,610	101,630[c]	No
618-3_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.68	--[d]	--
618-3_Shallow	Rad	Uranium-238	U-238	pCi/g	0.75	--[d]	--
618-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	238,577	101,630[c]	Yes
618-3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	80	--[d]	--
618-3_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.8	--[d]	--
618-3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	79	--[d]	--
618-4_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,200	37,999	No
618-4_Deep	non-Rad	Lead	7439-92-1	µg/kg	20,000	1.06E+07	No
618-4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	64,506	101,630[c]	No
618-4_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	20	--[d]	--
618-4_Deep	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
618-4_Deep	Rad	Uranium-238	U-238	pCi/g	22	--[d]	--
618-4_Deep_Focused	non-Rad	2-Butanone	78-93-3	µg/kg	130	1.67E+06	No
618-4_Deep_Focused	non-Rad	Acetone	67-64-1	µg/kg	16	2.23E+06	No
618-4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,600	--[b]	--
618-4_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	37,999	No
618-4_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	104,000	--[b]	--
618-4_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	4,700	--[b]	--
618-4_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,500	3.52E+06	No
618-4_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	27,700	--[b]	--
618-4_Deep_Focused	non-Rad	Diethyl ether	60-29-7	µg/kg	1.0	664,052	No
618-4_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	24,900	1.06E+07	No
618-4_Deep_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	40	2,098	No
618-4_Deep_Focused	non-Rad	Phenol	108-95-2	µg/kg	110	1.49E+06	No
618-4_Deep_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	24	275	No
618-4_Deep_Focused	non-Rad	Toluene	108-88-3	µg/kg	4.8	1.15E+06	No
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	34,000	2.00E+06[e]	No

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - kerosene range	TPHKEROSENE	µg/kg	42,000	2.00E+06[e]	No
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	65	2.00E+06[e]	No
618-4_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	20,777	101,630[c]	No
618-4_Deep_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	690	No
618-4_Deep_Focused	non-Rad	Trichloromonofluoromethane	75-69-4	µg/kg	12	1.95E+06	No
618-4_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	7.2	--[d]	--
618-4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.51	--[d]	--
618-4_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	6.9	--[d]	--
618-4_Overburden_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,500	37,999	No
618-4_Overburden_2	non-Rad	Lead	7439-92-1	µg/kg	4,700	1.06E+07	No
618-4_Overburden_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,197	101,630[c]	No
618-4_Overburden_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
618-4_Overburden_2	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
618-4_Overburden_3	non-Rad	Lead	7439-92-1	µg/kg	5,000	1.06E+07	No
618-4_Overburden_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,171	101,630[c]	No
618-4_Overburden_3	Rad	Uranium-233/234	U-233/234	pCi/g	0.42	--[d]	--
618-4_Overburden_3	Rad	Uranium-235	15117-96-1	pCi/g	0.032	--[d]	--
618-4_Overburden_3	Rad	Uranium-238	U-238	pCi/g	0.44	--[d]	--
618-4_Overburden_4	non-Rad	Lead	7439-92-1	µg/kg	4,800	1.06E+07	No
618-4_Overburden_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,323	101,630[c]	No
618-4_Overburden_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.94	--[d]	--
618-4_Overburden_4	Rad	Uranium-238	U-238	pCi/g	0.94	--[d]	--
618-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,200	37,999	No
618-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	49,000	1.06E+07	No
618-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	7,456	101,630[c]	No
618-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	3.2	--[d]	--
618-4_Shallow	Rad	Uranium-238	U-238	pCi/g	3.1	--[d]	--
618-5_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	5,200	37,999	No
618-5_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	470	3.52E+06	No
618-5_Deep	non-Rad	Chromium	7440-47-3	µg/kg	14,700	--[b]	--
618-5_Deep	non-Rad	Lead	7439-92-1	µg/kg	82,300	1.06E+07	No
618-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	26,618	101,630[c]	No
618-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	8.6	--[d]	--
618-5_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.46	--[d]	--
618-5_Deep	Rad	Uranium-238	U-238	pCi/g	8.9	--[d]	--
618-5_Deep_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.65E+06	--[b]	--
618-5_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	1,800	270,034	No
618-5_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,500	37,999	No
618-5_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	106,000	--[b]	--
618-5_Deep_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	672	--[b]	--
618-5_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,500	--[b]	--
618-5_Deep_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	10,500	--[b]	--
618-5_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	21,400	2.41E+08	No
618-5_Deep_Focused	non-Rad	Iron	7439-89-6	µg/kg	3.02E+07	1.43E+08	No
618-5_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,600	1.06E+07	No
618-5_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	579,000	--[b]	--
618-5_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	33	1.41E+06	No
618-5_Deep_Focused	non-Rad	Nickel	7440-02-0	µg/kg	11,300	--[b]	--
618-5_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	2,270	3.02E+06	No
618-5_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	36,540	101,630[c]	No
618-5_Deep_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	79,500	--[b]	--
618-5_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	65,800	--[b]	--
618-5_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-5_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.48	--[d]	--
618-5_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	12	--[d]	--
618-5_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,400	37,999	No
618-5_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	170	3.52E+06	No
618-5_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	9,700	--[b]	--
618-5_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,500	1.06E+07	No
618-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	9,773	101,630[c]	No
618-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	4.1	--[d]	--
618-5_Overburden	Rad	Uranium-238	U-238	pCi/g	4.6	--[d]	--
618-5_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,300	37,999	No
618-5_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,300	--[b]	--
618-5_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,100	1.06E+07	No
618-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,849	101,630[c]	No
618-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.94	--[d]	--
618-5_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
618-5_Staging Pile_4	non-Rad	Arsenic	7440-38-2	µg/kg	3,300	37,999	No
618-5_Staging Pile_4	non-Rad	Cadmium	7440-43-9	µg/kg	50	3.52E+06	No
618-5_Staging Pile_4	non-Rad	Chromium	7440-47-3	µg/kg	11,800	--[b]	--
618-5_Staging Pile_4	non-Rad	Lead	7439-92-1	µg/kg	5,300	1.06E+07	No
618-5_Staging Pile_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,364	101,630[c]	No
618-5_Staging Pile_4	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	--[d]	--
618-5_Staging Pile_4	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
618-5_Staging Pile_5	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	37,999	No
618-5_Staging Pile_5	non-Rad	Chromium	7440-47-3	µg/kg	10,300	--[b]	--
618-5_Staging Pile_5	non-Rad	Lead	7439-92-1	µg/kg	3,900	1.06E+07	No
618-5_Staging Pile_5	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,326	101,630[c]	No
618-5_Staging Pile_5	Rad	Uranium-233/234	U-233/234	pCi/g	1.5	--[d]	--
618-5_Staging Pile_5	Rad	Uranium-235	15117-96-1	pCi/g	0.17	--[d]	--
618-5_Staging Pile_5	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
618-7_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	5.25E+06	--[b]	--
618-7_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	560	270,034	No

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-7_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	1,891	37,999	No
618-7_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	68,874	--[b]	--
618-7_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	278	--[b]	--
618-7_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	65	3.52E+06	No
618-7_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	10,227	--[b]	--
618-7_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	9,152	--[b]	--
618-7_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	16,120	2.41E+08	No
618-7_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	2.60E+07	1.43E+08	No
618-7_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	14,567	1.06E+07	No
618-7_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	326,067	--[b]	--
618-7_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	44	1.41E+06	No
618-7_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	20,977	--[b]	--
618-7_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,547	--[b]	--
618-7_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	10,814	101,630[c]	No
618-7_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	74,576	--[b]	--
618-7_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	49,177	--[b]	--
618-7_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.067	--[b]	--
618-7_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	3.6	--[d]	--
618-7_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	0.36	--[d]	--
618-7_Shallow_1	Rad	Uranium-238	U-238	pCi/g	3.6	--[d]	--
618-7_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	4.97E+06	--[b]	--
618-7_Shallow_2	non-Rad	Antimony	7440-36-0	µg/kg	660	270,034	No
618-7_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,500	37,999	No
618-7_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	73,800	--[b]	--
618-7_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	440	--[b]	--
618-7_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	6,800	--[b]	--
618-7_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	9,300	--[b]	--
618-7_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	13,600	2.41E+08	No
618-7_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	2.60E+07	1.43E+08	No
618-7_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	2,800	1.06E+07	No
618-7_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	364,000	--[b]	--
618-7_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	20	1.41E+06	No
618-7_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	9,700	--[b]	--
618-7_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,500	--[b]	--
618-7_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,574	101,630[c]	No
618-7_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	74,700	--[b]	--
618-7_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	46,200	--[b]	--
618-7_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.57	--[d]	--
618-7_Shallow_2	Rad	Uranium-238	U-238	pCi/g	0.53	--[d]	--
618-7_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	6.74E+06	--[b]	--
618-7_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	450	270,034	No
618-7_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	2,800	37,999	No
618-7_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	82,500	--[b]	--
618-7_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	310	--[b]	--
618-7_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	190	3.52E+06	No
618-7_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	10,100	--[b]	--
618-7_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	--[b]	--
618-7_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	13,600	2.41E+08	No
618-7_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.43E+07	1.43E+08	No
618-7_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	4,300	1.06E+07	No
618-7_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	357,000	--[b]	--
618-7_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	20	1.41E+06	No
618-7_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	10,100	--[b]	--
618-7_Shallow_3	non-Rad	Tin	7440-31-5	µg/kg	1,800	--[b]	--
618-7_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,852	101,630[c]	No
618-7_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	68,200	--[b]	--
618-7_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	44,500	--[b]	--
618-7_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
618-7_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.085	--[d]	--
618-7_Shallow_3	Rad	Uranium-238	U-238	pCi/g	0.95	--[d]	--
618-7_Shallow_4	non-Rad	Aluminum	7429-90-5	µg/kg	5.65E+06	--[b]	--
618-7_Shallow_4	non-Rad	Antimony	7440-36-0	µg/kg	250	270,034	No
618-7_Shallow_4	non-Rad	Arsenic	7440-38-2	µg/kg	5,200	37,999	No
618-7_Shallow_4	non-Rad	Barium	7440-39-3	µg/kg	57,900	--[b]	--
618-7_Shallow_4	non-Rad	Beryllium	7440-41-7	µg/kg	220	--[b]	--
618-7_Shallow_4	non-Rad	Cadmium	7440-43-9	µg/kg	90	3.52E+06	No
618-7_Shallow_4	non-Rad	Chromium	7440-47-3	µg/kg	11,400	--[b]	--
618-7_Shallow_4	non-Rad	Cobalt	7440-48-4	µg/kg	6,700	--[b]	--
618-7_Shallow_4	non-Rad	Copper	7440-50-8	µg/kg	13,200	2.41E+08	No
618-7_Shallow_4	non-Rad	Iron	7439-89-6	µg/kg	2.12E+07	1.43E+08	No
618-7_Shallow_4	non-Rad	Lead	7439-92-1	µg/kg	3,000	1.06E+07	No
618-7_Shallow_4	non-Rad	Manganese	7439-96-5	µg/kg	285,000	--[b]	--
618-7_Shallow_4	non-Rad	Nickel	7440-02-0	µg/kg	12,900	--[b]	--
618-7_Shallow_4	non-Rad	Tin	7440-31-5	µg/kg	710	--[b]	--
618-7_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,064	101,630[c]	No
618-7_Shallow_4	non-Rad	Vanadium	7440-62-2	µg/kg	54,800	--[b]	--
618-7_Shallow_4	non-Rad	Zinc	7440-66-6	µg/kg	37,000	--[b]	--
618-7_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.69	--[d]	--
618-7_Shallow_4	Rad	Uranium-238	U-238	pCi/g	0.76	--[d]	--
618-7_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	150	7.38E+07	No
618-7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.61E+06	--[b]	--
618-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	980	270,034	No
618-7_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	6.7	91,112	No
618-7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,200	37,999	No

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-7_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	92,800	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	88	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	66	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	52	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	11	--[b]	--
618-7_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	370	--[b]	--
618-7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	470	--[b]	--
618-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	6,200	3.52E+06	No
618-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	65,900	--[b]	--
618-7_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	69	--[b]	--
618-7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,000	--[b]	--
618-7_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	25,000	2.41E+08	No
618-7_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	45	--[b]	--
618-7_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	33	2.85E+07	No
618-7_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	48	--[b]	--
618-7_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.87E+07	1.43E+08	No
618-7_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,500	1.06E+07	No
618-7_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	425,000	--[b]	--
618-7_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	20	1.41E+06	No
618-7_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	17,200	--[b]	--
618-7_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	410	--[b]	--
618-7_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,200	--[b]	--
618-7_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	680,000	2.00E+06[e]	No
618-7_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	19,563	101,630[c]	No
618-7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	80,500	--[b]	--
618-7_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	52,400	--[b]	--
618-7_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.010	--[b]	--
618-7_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-7_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.97	--[d]	--
618-7_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	6.4	--[d]	--
618-8_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,100	37,999	No
618-8_Shallow	non-Rad	Barium	7440-39-3	µg/kg	97,600	--[b]	--
618-8_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	12,400	--[b]	--
618-8_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,100	1.06E+07	No
618-8_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	846	3.02E+06	No
618-8_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,720	101,630[c]	No
618-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	--[d]	--
618-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.73	--[d]	--
618-9_Shallow_Focused	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	110	270	No
618-9_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	680	2.23E+06	No
618-9_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	390	7,793	No
618-9_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.57E+06	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1016	12674-11-2	µg/kg	1,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1221	11104-28-2	µg/kg	1,900	5,773	No
618-9_Shallow_Focused	non-Rad	Aroclor-1232	11141-16-5	µg/kg	1,900	5,773	No
618-9_Shallow_Focused	non-Rad	Aroclor-1242	53469-21-9	µg/kg	1,900	97,738	No
618-9_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,900	91,112	No
618-9_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	11,600	37,999	No
618-9_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	90,200	--[b]	--
618-9_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	330	--[b]	--
618-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	5,200	--[b]	--
618-9_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	2,700	8.41E+06	No
618-9_Shallow_Focused	non-Rad	Chlordane	57-74-9	µg/kg	69	--[b]	--
618-9_Shallow_Focused	non-Rad	Chloroform	67-66-3	µg/kg	9.0	1,289	No
618-9_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,700	--[b]	--
618-9_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,400	--[b]	--
618-9_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	16,700	2.41E+08	No
618-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	7,200	2.85E+07	No
618-9_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	44	--[b]	--
618-9_Shallow_Focused	non-Rad	Hexachlorobutadiene	87-68-3	µg/kg	760	--[b]	--
618-9_Shallow_Focused	non-Rad	Hexachloroethane	67-72-1	µg/kg	17,000	65,103	No
618-9_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.49E+07	1.43E+08	No
618-9_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	7,700	1.06E+07	No
618-9_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	359,000	--[b]	--
618-9_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	330	1.41E+06	No
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	2,098	Yes
618-9_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,600	--[b]	--
618-9_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	1.67E+06	1.36E+07	No
618-9_Shallow_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	920	275	Yes
618-9_Shallow_Focused	non-Rad	Toluene	108-88-3	µg/kg	9.0	1.15E+06	No
618-9_Shallow_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	690	No
618-9_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	3,100	101,630[c]	No
618-9_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	59,300	--[b]	--
618-9_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	52,300	--[b]	--
618-9_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.071	--[d]	--
618-9_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	3.0	--[d]	--
628-4_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,374	37,999	No
628-4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	61	--[b]	--
628-4_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,284	1.06E+07	No
628-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,308	101,630[c]	No
628-4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.033	--[b]	--
628-4_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.87	--[d]	--

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
628-4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.78	--[d]	--
628-4_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	42	97,738	No
628-4_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,115	91,112	No
628-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	243	--[b]	--
628-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	38	--[b]	--
628-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,864	37,999	No
628-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	99,167	1.06E+07	No
628-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,163	101,630[c]	No
628-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
628-4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.11	--[d]	--
628-4_Shallow	Rad	Uranium-238	U-238	pCi/g	1.0	--[d]	--
UPR-300-17_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	117	7.38E+07	No
UPR-300-17_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.34E+06	--[b]	--
UPR-300-17_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	7.0	--[b]	--
UPR-300-17_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	359	270,034	No
UPR-300-17_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,970	91,112	No
UPR-300-17_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	450	--[b]	--
UPR-300-17_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	113	--[b]	--
UPR-300-17_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,573	37,999	No
UPR-300-17_Shallow	non-Rad	Barium	7440-39-3	µg/kg	81,014	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	59	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	44	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	33	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	9.9	--[b]	--
UPR-300-17_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	240	--[b]	--
UPR-300-17_Shallow	non-Rad	Boron	7440-42-8	µg/kg	3,903	1.08E+08	No
UPR-300-17_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	173	3.52E+06	No
UPR-300-17_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	13,795	--[b]	--
UPR-300-17_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	39	--[b]	--
UPR-300-17_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,688	--[b]	--
UPR-300-17_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,135	2.41E+08	No
UPR-300-17_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	35	--[b]	--
UPR-300-17_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.9	6.17E+07	No
UPR-300-17_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	5.9	--[b]	--
UPR-300-17_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07	1.43E+08	No
UPR-300-17_Shallow	non-Rad	Lead	7439-92-1	µg/kg	11,240	1.06E+07	No
UPR-300-17_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	285,159	--[b]	--
UPR-300-17_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	69	1.41E+06	No
UPR-300-17_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	412	2.58E+07	No
UPR-300-17_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	48	2.26E+06	No
UPR-300-17_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	563,654	--[b]	--
UPR-300-17_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	34	--[b]	--
UPR-300-17_Shallow	non-Rad	Silver	7440-22-4	µg/kg	340	--[b]	--
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,950	2.00E+06[e]	No
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	210,420	2.00E+06[e]	No
UPR-300-17_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,420	101,630[c]	No
UPR-300-17_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	52,150	--[b]	--
UPR-300-17_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	157,172	--[b]	--
UPR-300-17_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	6.1	--[d]	--
UPR-300-17_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.91	--[d]	--
UPR-300-17_Shallow	Rad	Uranium-238	U-238	pCi/g	4.0	--[d]	--
UPR-300-46_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	13	7.38E+07	No
UPR-300-46_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.80E+06	--[b]	--
UPR-300-46_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	381	270,034	No
UPR-300-46_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	879	91,112	No
UPR-300-46_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	490	--[b]	--
UPR-300-46_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	84	--[b]	--
UPR-300-46_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,846	37,999	No
UPR-300-46_Shallow	non-Rad	Barium	7440-39-3	µg/kg	82,137	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	3.9	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	5.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.8	--[b]	--
UPR-300-46_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	222	--[b]	--
UPR-300-46_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,714	1.08E+08	No
UPR-300-46_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	95	3.52E+06	No
UPR-300-46_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,173	--[b]	--
UPR-300-46_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	5.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,361	--[b]	--
UPR-300-46_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,151	2.41E+08	No
UPR-300-46_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	1.3	--[b]	--
UPR-300-46_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	9.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.2	6.17E+07	No
UPR-300-46_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	7.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07	1.43E+08	No
UPR-300-46_Shallow	non-Rad	Lead	7439-92-1	µg/kg	7,105	1.06E+07	No
UPR-300-46_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	311,001	--[b]	--
UPR-300-46_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	29	1.41E+06	No
UPR-300-46_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	456	2.58E+07	No
UPR-300-46_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	36	2.26E+06	No
UPR-300-46_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,230	--[b]	--
UPR-300-46_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	4.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,897	101,630[c]	No
UPR-300-46_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	53,808	--[b]	--

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
UPR-300-46_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	47,945	--[b]	--
UPR-300-46_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.070	--[b]	--
UPR-300-46_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.8	--[d]	--
UPR-300-46_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
UPR-300-46_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--

Notes:

a. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

b. The calculated soil screening level for the analyte is considered non-representative because: (1) breakthrough is simulated within 1,000 years for some soil columns while other soil columns (a majority) show no breakthrough (breakthrough defined as concentrations below 1E-04 µg/L or activity below 1E-04 pCi/L), and/or (2) the calculated residual mass of contaminant in the pore volume is high enough to represent a substantial (and physically improbable) reduction in porosity.

c. Due to the complex geochemistry of uranium in 300 Area source operable unit soils, uranium SSLs were derived using a site-speicific two-dimensional model as described in ECF-300FF5-11-0151.

d. Uranium isotopes are accounted for by converting from activity-based (pCi/g) to mass-based (µg/kg) concentrations and then summing to provide a mass-based total uranium exposure point concentration (identified as Total_U_Isotopes), as described in ECF-300NPL-11-0137, Computation of Exposure Point Concentrations for the 300-FF-2 Source Operable Unit.

e. The soil screening level for Total Petroleum Hydrocarbons is a default screening level obtained from WAC 173-340-900, Table 747-5, "Residual Saturation Screening Levels for TPH."

f. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

-- = Not applicable or no value

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300 ASH PITS_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	52	133	No
300 ASH PITS_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,078	11,726	No
300 ASH PITS_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	96	--[b]	--
300 ASH PITS_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	76	1.50E+06	No
300 ASH PITS_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,450	2.64E+06[c]	No
300 ASH PITS_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.039	--[d]	--
300 ASH PITS_Shallow	Rad	Uranium-238	U-238	pCi/g	0.82	--[d]	--
300 VTS_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.029	--[b]	--
300-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	13,500	11,726	Yes
300-10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	200	--[b]	--
300-10_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	230	1.50E+06	No
300-10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,078	2.64E+06[c]	No
300-10_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.16	--[b]	--
300-10_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.041	--[d]	--
300-10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
300-109_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.62E+06	--[b]	--
300-109_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	122	--[b]	--
300-109_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	40	--[b]	--
300-109_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,420	11,726	No
300-109_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	63,300	--[b]	--
300-109_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.2	--[b]	--
300-109_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	2.3	--[b]	--
300-109_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	180	--[b]	--
300-109_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	632	--[e]	--
300-109_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	59	176,066	No
300-109_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,950	--[b]	--
300-109_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	1.8	--[b]	--
300-109_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	6,420	--[b]	--
300-109_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,800	3.40E+06	No
300-109_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	14	--[b]	--
300-109_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.75E+07	1.43E+08	No
300-109_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,890	1.48E+06	No
300-109_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	278,000	--[b]	--
300-109_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	22	8,451	No
300-109_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	341	--[b]	--
300-109_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,490	--[b]	--
300-109_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	1.6	--[b]	--
300-109_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,108	2.64E+06[c]	No
300-109_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	47,600	--[e]	--
300-109_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	34,700	6.41E+07	No
300-109_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	--[d]	--
300-109_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
300-109_Staging Pile Area_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.78E+06	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	37	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	19	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,580	11,726	No
300-109_Staging Pile Area_Focused	non-Rad	Barium	7440-39-3	µg/kg	72,700	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	2.1	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.3	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.3	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	203	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,060	--[e]	--
300-109_Staging Pile Area_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	66	176,066	No
300-109_Staging Pile Area_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,170	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,950	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Copper	7440-50-8	µg/kg	11,600	3.40E+06	No
300-109_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	5.1	2.82E+08	No
300-109_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	29	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.84E+07	1.43E+08	No
300-109_Staging Pile Area_Focused	non-Rad	Lead	7439-92-1	µg/kg	5,030	1.48E+06	No
300-109_Staging Pile Area_Focused	non-Rad	Manganese	7439-96-5	µg/kg	286,000	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	408	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,570	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	µg/kg	7.0	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,450	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,877	2.64E+06[c]	No
300-109_Staging Pile Area_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	45,100	--[e]	--
300-109_Staging Pile Area_Focused	non-Rad	Zinc	7440-66-6	µg/kg	48,800	6.41E+07	No
300-109_Staging Pile Area_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	2.5	--[d]	--
300-109_Staging Pile Area_Focused	Rad	Uranium-238	U-238	pCi/g	2.3	--[d]	--
300-18_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,200	11,726	No
300-18_Shallow	non-Rad	Barium	7440-39-3	µg/kg	63,400	--[b]	--
300-18_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	650	--[b]	--
300-18_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	40	176,066	No
300-18_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	6,900	--[b]	--
300-18_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,600	1.48E+06	No
300-18_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,136	2.64E+06[c]	No
300-18_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.65	--[d]	--
300-18_Shallow	Rad	Uranium-238	U-238	pCi/g	0.41	--[d]	--
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	120,000	--[e]	--
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	230,000	--[e]	--

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300-23_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	52,000	--[e]	--
300-259_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	5.99E+06	--[b]	--
300-259_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	322	252,032	No
300-259_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,096	11,726	No
300-259_Shallow	non-Rad	Barium	7440-39-3	µg/kg	75,232	--[b]	--
300-259_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	226	--[b]	--
300-259_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,303	--[e]	--
300-259_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	252	176,066	No
300-259_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,901	--[b]	--
300-259_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	5,831	--[b]	--
300-259_Shallow	non-Rad	Copper	7440-50-8	µg/kg	10,692	3.40E+06	No
300-259_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	1.43E+08	No
300-259_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,625	1.48E+06	No
300-259_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	318,874	--[b]	--
300-259_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	10	8,451	No
300-259_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	303	--[b]	--
300-259_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,751	--[b]	--
300-259_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,876	2.64E+06[c]	No
300-259_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	42,626	--[e]	--
300-259_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	479,584	6.41E+07	No
300-259_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.6	--[d]	--
300-259_Shallow	Rad	Uranium-238	U-238	pCi/g	1.3	--[d]	--
300-260_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.17E+06	--[b]	--
300-260_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	922	252,032	No
300-260_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,160	11,726	No
300-260_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	122,000	--[b]	--
300-260_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	239	--[b]	--
300-260_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	8,360	--[e]	--
300-260_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	110	176,066	No
300-260_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,890	--[b]	--
300-260_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,430	--[b]	--
300-260_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	73,300	3.40E+06	No
300-260_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.04E+07	1.43E+08	No
300-260_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	18,300	1.48E+06	No
300-260_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	328,000	--[b]	--
300-260_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	12	8,451	No
300-260_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	537	--[b]	--
300-260_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,200	--[b]	--
300-260_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	206	--[b]	--
300-260_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,800	2.64E+06[c]	No
300-260_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	59,000	--[e]	--
300-260_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	77,400	6.41E+07	No
300-260_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.25	--[d]	--
300-260_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	4.3	--[d]	--
300-272_Overburden_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	13,100	--[e]	--
300-272_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	43,100	--[e]	--
300-275_Shallow_1	non-Rad	Acenaphthene	83-32-9	µg/kg	960	4.94E+07	No
300-275_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	5.61E+06	--[b]	--
300-275_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	260	252,032	No
300-275_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	2,211	11,726	No
300-275_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	75,261	--[b]	--
300-275_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.3	--[b]	--
300-275_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.9	--[b]	--
300-275_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	452	--[b]	--
300-275_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	1,466	--[e]	--
300-275_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	83	176,066	No
300-275_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	8,022	--[b]	--
300-275_Shallow_1	non-Rad	Chrysene	218-01-9	µg/kg	2.2	--[b]	--
300-275_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	5,847	--[b]	--
300-275_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	42,923	3.40E+06	No
300-275_Shallow_1	non-Rad	Fluoranthene	206-44-0	µg/kg	2,300	2.82E+08	No
300-275_Shallow_1	non-Rad	Fluorene	86-73-7	µg/kg	81	1.06E+08	No
300-275_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	1.79E+07	1.43E+08	No
300-275_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	7,189	1.48E+06	No
300-275_Shallow_1	non-Rad	Lithium	7439-93-2	µg/kg	6,686	--[e]	--
300-275_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	276,815	--[b]	--
300-275_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	17	8,451	No
300-275_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	378	--[b]	--
300-275_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	9,461	--[b]	--
300-275_Shallow_1	non-Rad	Silver	7440-22-4	µg/kg	121	--[b]	--
300-275_Shallow_1	non-Rad	Strontium	7440-24-6	µg/kg	20,196	--[b]	--
300-275_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,483	--[b]	--
300-275_Shallow_1	non-Rad	Uranium	7440-61-1	µg/kg	2,500	2.64E+06[c]	No
300-275_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	45,128	--[e]	--
300-275_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	41,014	6.41E+07	No
300-275_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.046	--[b]	--
300-275_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	7.7	--[d]	--
300-275_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.0	--[d]	--
300-275_Shallow_1	Rad	Uranium-238	U-238	pCi/g	7.4	--[d]	--
300-275_Shallow_2	non-Rad	Acenaphthene	83-32-9	µg/kg	3.6	4.94E+07	No
300-275_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	6.24E+06	--[b]	--
300-275_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,761	11,726	No

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300-275_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	68,607	--[b]	--
300-275_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	254	--[b]	--
300-275_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	1,147	--[e]	--
300-275_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	144	176,066	No
300-275_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	8,994	--[b]	--
300-275_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	5,977	--[b]	--
300-275_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	11,596	3.40E+06	No
300-275_Shallow_2	non-Rad	Fluoranthene	206-44-0	µg/kg	56	2.82E+08	No
300-275_Shallow_2	non-Rad	Fluorene	86-73-7	µg/kg	2.6	1.06E+08	No
300-275_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	1.43E+08	No
300-275_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	4,099	1.48E+06	No
300-275_Shallow_2	non-Rad	Lithium	7439-93-2	µg/kg	7,067	--[e]	--
300-275_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	292,731	--[b]	--
300-275_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	28	8,451	No
300-275_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	404	--[b]	--
300-275_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	9,593	--[b]	--
300-275_Shallow_2	non-Rad	Strontium	7440-24-6	µg/kg	27,081	--[b]	--
300-275_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,149	--[b]	--
300-275_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,725	2.64E+06[c]	No
300-275_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	51,632	--[e]	--
300-275_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	41,245	6.41E+07	No
300-275_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
300-275_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
300-275_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.2	--[d]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.32E+06	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1016	12674-11-2	µg/kg	10	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	16	143	No
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	190	133	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	84	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	17	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,638	11,726	No
300-33, 300-41, 300-256_Shallow	non-Rad	Barium	7440-39-3	µg/kg	72,411	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	256	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,484	--[e]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	228	1.50E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	94	176,066	No
300-33, 300-41, 300-256_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	8,781	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,273	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,662	3.40E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	1,651	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.00E+07	1.43E+08	No
300-33, 300-41, 300-256_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,268	1.48E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	5,495	--[e]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	314,762	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	16	8,451	No
300-33, 300-41, 300-256_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	2.9	1,931	No
300-33, 300-41, 300-256_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	486	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,880	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	8,617	1.36E+07	No
300-33, 300-41, 300-256_Shallow	non-Rad	Silver	7440-22-4	µg/kg	782	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	7,260	2.64E+06[c]	No
300-33, 300-41, 300-256_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	52,694	--[e]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,462	6.41E+07	No
300-33, 300-41, 300-256_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.1	--[d]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.34	--[d]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-238	U-238	pCi/g	2.1	--[d]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.51E+06	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	330	133	Yes
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	385	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,240	11,726	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	64,600	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	169	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,030	--[e]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	100	176,066	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,080	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,640	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,400	3.40E+06	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	1,300	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.86E+07	1.43E+08	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	3,160	1.48E+06	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Lithium	7439-93-2	µg/kg	6,580	--[e]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	259,000	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2.2	1,931	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	275	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,040	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	17,900	1.36E+07	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,460	2.64E+06[c]	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	51,400	--[e]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	38,900	6.41E+07	No
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	3.0	--[d]	--
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	2.2	--[d]	--

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300-37_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	100	--[b]	--
300-37_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,200	--[b]	--
300-44_Overburden_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	9,100	11,726	No
300-44_Overburden_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,027	2.64E+06[c]	No
300-44_Overburden_Focused	Rad	Uranium-238	U-238	pCi/g	0.35	--[d]	--
300-44_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.71E+06	--[b]	--
300-44_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	4,100	252,032	No
300-44_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	16,900	11,726	Yes
300-44_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	75,200	--[b]	--
300-44_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	480	--[b]	--
300-44_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,300	--[b]	--
300-44_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,200	--[b]	--
300-44_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	7,800	3.40E+06	No
300-44_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.94E+07	1.43E+08	No
300-44_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	303,000	--[b]	--
300-44_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,600	--[b]	--
300-44_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	872	2.64E+06[c]	No
300-44_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	43,200	--[e]	--
300-44_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	37,800	6.41E+07	No
300-44_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.29	--[d]	--
300-45_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	86	--[b]	--
300-45_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	290	--[b]	--
300-45_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,600	2.64E+06[c]	No
300-45_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.023	--[b]	--
300-45_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.061	--[d]	--
300-45_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2	--[d]	--
300-49_Overburden	non-Rad	1,2,4-Trichlorobenzene	120-82-1	µg/kg	31	37,238	No
300-49_Overburden	non-Rad	1,4-Dichlorobenzene	106-46-7	µg/kg	29	164,520	No
300-49_Overburden	non-Rad	2,4-Dinitrotoluene	121-14-2	µg/kg	19	330	No
300-49_Overburden	non-Rad	2-Chlorophenol	95-57-8	µg/kg	51	393,603	No
300-49_Overburden	non-Rad	4-Chloro-3-methylphenol	59-50-7	µg/kg	46	1.87E+08	No
300-49_Overburden	non-Rad	Acenaphthene	83-32-9	µg/kg	31	4.94E+07	No
300-49_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.30E+06	--[b]	--
300-49_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	232	252,032	No
300-49_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,008	--[b]	--
300-49_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,291	11,726	No
300-49_Overburden	non-Rad	Barium	7440-39-3	µg/kg	76,068	--[b]	--
300-49_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	201	--[b]	--
300-49_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	174	176,066	No
300-49_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	18,106	--[b]	--
300-49_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,127	--[b]	--
300-49_Overburden	non-Rad	Copper	7440-50-8	µg/kg	536,000	3.40E+06	No
300-49_Overburden	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	52	3.56E+07	No
300-49_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.08E+07	1.43E+08	No
300-49_Overburden	non-Rad	Lead	7439-92-1	µg/kg	36,964	1.48E+06	No
300-49_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	316,669	--[b]	--
300-49_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	13,035	--[b]	--
300-49_Overburden	non-Rad	n-Nitrosodi-n-dipropylamine	621-64-7	µg/kg	40	330	No
300-49_Overburden	non-Rad	Pentachlorophenol	87-86-5	µg/kg	50	1,980	No
300-49_Overburden	non-Rad	Phenol	108-95-2	µg/kg	50	6.21E+06	No
300-49_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	40	--[b]	--
300-49_Overburden	non-Rad	Silver	7440-22-4	µg/kg	703	--[b]	--
300-49_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,066	2.64E+06[c]	No
300-49_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	50,380	--[e]	--
300-49_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	141,984	6.41E+07	No
300-49_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	1.0	--[d]	--
300-49_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.057	--[d]	--
300-49_Overburden	Rad	Uranium-238	U-238	pCi/g	1.0	--[d]	--
300-49_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.92E+06	--[b]	--
300-49_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	176	252,032	No
300-49_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,431	11,726	No
300-49_Shallow	non-Rad	Barium	7440-39-3	µg/kg	89,874	--[b]	--
300-49_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	303	--[b]	--
300-49_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,170	--[b]	--
300-49_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,323	--[b]	--
300-49_Shallow	non-Rad	Copper	7440-50-8	µg/kg	14,870	3.40E+06	No
300-49_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.59E+07	1.43E+08	No
300-49_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,629	1.48E+06	No
300-49_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	361,805	--[b]	--
300-49_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	10,664	--[b]	--
300-49_Shallow	non-Rad	Silver	7440-22-4	µg/kg	621	--[b]	--
300-49_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,983	2.64E+06[c]	No
300-49_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	58,672	--[e]	--
300-49_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	54,651	6.41E+07	No
300-49_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.15	--[b]	--
300-49_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
300-49_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
300-49_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
300-50_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.68E+06	--[b]	--
300-50_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	33	--[b]	--
300-50_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	229	--[b]	--
300-50_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	6,897	11,726	No

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300-50_Overburden	non-Rad	Barium	7440-39-3	µg/kg	117,742	--[b]	--
300-50_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	325	--[b]	--
300-50_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	563	176,066	No
300-50_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	12,197	--[b]	--
300-50_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	9,389	--[b]	--
300-50_Overburden	non-Rad	Copper	7440-50-8	µg/kg	64,527	3.40E+06	No
300-50_Overburden	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07	1.43E+08	No
300-50_Overburden	non-Rad	Lead	7439-92-1	µg/kg	5,905	1.48E+06	No
300-50_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	314,271	--[b]	--
300-50_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	15,229	--[b]	--
300-50_Overburden	non-Rad	Silver	7440-22-4	µg/kg	1,202	--[b]	--
300-50_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	17,919	2.64E+06[c]	No
300-50_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	45,243	--[e]	--
300-50_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	45,889	6.41E+07	No
300-50_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.056	--[b]	--
300-50_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	6.0	--[d]	--
300-50_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.45	--[d]	--
300-50_Overburden	Rad	Uranium-238	U-238	pCi/g	6.0	--[d]	--
300-50_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.88E+06	--[b]	--
300-50_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	3,000	252,032	No
300-50_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	126	--[b]	--
300-50_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,403	11,726	No
300-50_Shallow	non-Rad	Barium	7440-39-3	µg/kg	103,029	--[b]	--
300-50_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	282	--[b]	--
300-50_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	19	--[b]	--
300-50_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	463	176,066	No
300-50_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	16,841	--[b]	--
300-50_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,109	--[b]	--
300-50_Shallow	non-Rad	Copper	7440-50-8	µg/kg	16,820	3.40E+06	No
300-50_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	1.43E+08	No
300-50_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,381	1.48E+06	No
300-50_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	318,120	--[b]	--
300-50_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,413	--[b]	--
300-50_Shallow	non-Rad	Silver	7440-22-4	µg/kg	2,992	--[b]	--
300-50_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	22,938	2.64E+06[c]	No
300-50_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	46,964	--[e]	--
300-50_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,344	6.41E+07	No
300-50_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.056	--[b]	--
300-50_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	7.9	--[d]	--
300-50_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.66	--[d]	--
300-50_Shallow	Rad	Uranium-238	U-238	pCi/g	8.4	--[d]	--
300-8_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	574	--[b]	--
300-8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,374	2.64E+06[c]	No
300-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.79	--[d]	--
300-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.82	--[d]	--
316-1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	40,572	2.64E+06[c]	No
316-1_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.10	--[b]	--
316-1_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.32	--[b]	--
316-1_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	13	--[d]	--
316-1_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
316-1_Overburden	Rad	Uranium-238	U-238	pCi/g	13	--[d]	--
316-1_Shallow_1	non-Rad	Aroclor-1248	12672-29-6	µg/kg	3,000	133	Yes
316-1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	19,014	11,726	Yes
316-1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	69	--[b]	--
316-1_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	98	1.50E+06	No
316-1_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	83,027	2.64E+06[c]	No
316-1_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.032	--[b]	--
316-1_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.2	--[d]	--
316-1_Shallow_1	Rad	Uranium-238	U-238	pCi/g	28	--[d]	--
316-1_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	1.11E+07	--[b]	--
316-1_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	490	252,032	No
316-1_Shallow_3	non-Rad	Aroclor-1254	11097-69-1	µg/kg	98	--[b]	--
316-1_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	5,138	11,726	No
316-1_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	129,106	--[b]	--
316-1_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	416	--[b]	--
316-1_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	342	--[b]	--
316-1_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	474	176,066	No
316-1_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	50,455	--[b]	--
316-1_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	9,703	--[b]	--
316-1_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	1.37E+06	3.40E+06	No
316-1_Shallow_3	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	3.2	--[b]	--
316-1_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.44E+07	1.43E+08	No
316-1_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	14,409	1.48E+06	No
316-1_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	392,825	--[b]	--
316-1_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	1,105	8,451	No
316-1_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	94,656	--[b]	--
316-1_Shallow_3	non-Rad	Phenol	108-95-2	µg/kg	28	6.21E+06	No
316-1_Shallow_3	non-Rad	Selenium	7782-49-2	µg/kg	1,444	302,457	No
316-1_Shallow_3	non-Rad	Silver	7440-22-4	µg/kg	13,196	--[b]	--
316-1_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	63,074	2.64E+06[c]	No
316-1_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	56,707	--[e]	--
316-1_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	82,016	6.41E+07	No

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
316-1_Shallow_3	Rad	Cesium-137	10045-97-3	pCi/g	0.37	--[b]	--
316-1_Shallow_3	Rad	Cobalt-60	10198-40-0	pCi/g	2.3	--[b]	--
316-1_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	23	--[d]	--
316-1_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	2.6	--[d]	--
316-1_Shallow_3	Rad	Uranium-238	U-238	pCi/g	21	--[d]	--
316-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	µg/kg	62	--[b]	--
316-1_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	42,963	2.64E+06[c]	No
316-1_Shallow_4	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--
316-1_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	16	--[d]	--
316-1_Shallow_4	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
316-1_Shallow_4	Rad	Uranium-238	U-238	pCi/g	14	--[d]	--
316-2_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	210,452	2.64E+06[c]	No
316-2_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.031	--[b]	--
316-2_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.092	--[b]	--
316-2_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	86	--[d]	--
316-2_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	12	--[d]	--
316-2_Shallow_1	Rad	Uranium-238	U-238	pCi/g	69	--[d]	--
316-2_Shallow_2	non-Rad	Aroclor-1248	12672-29-6	µg/kg	697	133	Yes
316-2_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	µg/kg	42	--[b]	--
316-2_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	110	--[b]	--
316-2_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	291,369	2.64E+06[c]	No
316-2_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	0.45	--[b]	--
316-2_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.45	--[b]	--
316-2_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	115	--[d]	--
316-2_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	11	--[d]	--
316-2_Shallow_2	Rad	Uranium-238	U-238	pCi/g	96	--[d]	--
316-2_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	8,000	11,726	No
316-2_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	260	--[b]	--
316-2_Shallow_3	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	180	1.50E+06	No
316-2_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	73,174	2.64E+06[c]	No
316-2_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.91	--[d]	--
316-2_Shallow_3	Rad	Uranium-238	U-238	pCi/g	24	--[d]	--
316-5_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	3,070	11,726	No
316-5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	38	--[b]	--
316-5_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	146	--[b]	--
316-5_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	100	1.50E+06	No
316-5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	271,835	2.64E+06[c]	No
316-5_Shallow_1	Rad	Americium-241	14596-10-2	pCi/g	0.48	--[b]	--
316-5_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	2.3	--[b]	--
316-5_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	19	--[d]	--
316-5_Shallow_1	Rad	Uranium-238	U-238	pCi/g	89	--[d]	--
316-5_Shallow_2	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	140	210	No
316-5_Shallow_2	non-Rad	2-Butoxyethanol	111-76-2	µg/kg	240	2.58E+07	No
316-5_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	3,180	11,726	No
316-5_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	76,700	--[b]	--
316-5_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	180	--[b]	--
316-5_Shallow_2	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	110	1.50E+06	No
316-5_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	6,900	--[b]	--
316-5_Shallow_2	non-Rad	Chrysene	218-01-9	µg/kg	38	--[b]	--
316-5_Shallow_2	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	146	3.56E+07	No
316-5_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	3,200	1.48E+06	No
316-5_Shallow_2	non-Rad	Selenium	7782-49-2	µg/kg	490	302,457	No
316-5_Shallow_2	non-Rad	Silver	7440-22-4	µg/kg	3,600	--[b]	--
316-5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	204,701	2.64E+06[c]	No
316-5_Shallow_2	Rad	Americium-241	14596-10-2	pCi/g	0.12	--[b]	--
316-5_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	1.7	--[b]	--
316-5_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--
316-5_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	9.0	--[d]	--
316-5_Shallow_2	Rad	Uranium-238	U-238	pCi/g	68	--[d]	--
316-5_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	57	133	No
316-5_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	70	--[b]	--
316-5_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--[b]	--
316-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,300	11,726	No
316-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	190	--[b]	--
316-5_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	1,500	3.56E+07	No
316-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	138,095	2.64E+06[c]	No
316-5_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.8	--[b]	--
316-5_Shallow_Focused	Rad	Europium-155	14391-16-3	pCi/g	0.072	--[b]	--
316-5_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	7.7	--[d]	--
316-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	45	--[d]	--
331 LSLDF_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	25	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	590	2.28E+08	No
331 LSLDF_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	0.56	148	No
331 LSLDF_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	µg/kg	0.39	53	No
331 LSLDF_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.90E+06	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	360	252,032	No
331 LSLDF_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	850	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,400	11,726	No
331 LSLDF_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	78,600	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	570	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	910	--[b]	--

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
331 LSLDF_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,700	--[e]	--
331 LSLDF_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	340	1.50E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	140	176,066	No
331 LSLDF_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,300	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,400	3.40E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Dieldrin	60-57-1	µg/kg	13	26	No
331 LSLDF_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	98	3.56E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan I	959-98-8	µg/kg	1.9	1,433	No
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	µg/kg	3.1	1,433	No
331 LSLDF_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.20E+07	1.43E+08	No
331 LSLDF_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	9,000	1.48E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	349,000	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	110	8,451	No
331 LSLDF_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	µg/kg	3.3	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	11	1,931	No
331 LSLDF_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	590	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	41,700	1.36E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	9,500	3.03E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,100	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	2,300	2.64E+06[c]	No
331 LSLDF_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	53,100	--[e]	--
331 LSLDF_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	137,000	6.41E+07	No
331 LSLDF_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	--[d]	--
331 LSLDF_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.47	--[d]	--
600-243_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	µg/kg	279	4.65E+06	No
600-243_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	31	--[b]	--
600-243_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	1,300	252,032	No
600-243_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	27	--[b]	--
600-243_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	18	--[b]	--
600-243_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,159	11,726	No
600-243_Shallow	non-Rad	Barium	7440-39-3	µg/kg	292,072	--[b]	--
600-243_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	43	--[b]	--
600-243_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	43	--[b]	--
600-243_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	46	--[b]	--
600-243_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	32	--[b]	--
600-243_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	2,079	--[b]	--
600-243_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	432	--[b]	--
600-243_Shallow	non-Rad	Boron	7440-42-8	µg/kg	294,463	--[e]	--
600-243_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	793	176,066	No
600-243_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	18,006	--[b]	--
600-243_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	63	--[b]	--
600-243_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,207	--[b]	--
600-243_Shallow	non-Rad	Copper	7440-50-8	µg/kg	53,981	3.40E+06	No
600-243_Shallow	non-Rad	Dibenzofuran	132-64-9	µg/kg	78	246,969	No
600-243_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	37	3.56E+07	No
600-243_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	79	2.82E+08	No
600-243_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	28	--[b]	--
600-243_Shallow	non-Rad	Lead	7439-92-1	µg/kg	40,139	1.48E+06	No
600-243_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	208,289	--[b]	--
600-243_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	1,869	--[b]	--
600-243_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	204	6.97E+07	No
600-243_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	21,395	--[b]	--
600-243_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	70	--[b]	--
600-243_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	5,709	302,457	No
600-243_Shallow	non-Rad	Silver	7440-22-4	µg/kg	500	--[b]	--
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	95,319	--[e]	--
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	334,524	--[e]	--
600-243_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	46,986	--[e]	--
600-243_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	84,099	6.41E+07	No
600-259_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.034	--[b]	--
600-259_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.068	--[b]	--
600-259_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.038	--[b]	--
600-47_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,300	11,726	No
600-47_Shallow	non-Rad	Barium	7440-39-3	µg/kg	67,000	--[b]	--
600-47_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	500	--[b]	--
600-47_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	90	176,066	No
600-47_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	5,500	--[b]	--
600-47_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,500	1.48E+06	No
600-47_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,303	2.64E+06[c]	No
600-47_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	--[d]	--
600-47_Shallow	Rad	Uranium-238	U-238	pCi/g	1.6	--[d]	--
618-1_Deep	non-Rad	Aluminum	7429-90-5	µg/kg	6.37E+06	--[b]	--
618-1_Deep	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,760	--[b]	--
618-1_Deep	non-Rad	Aroclor-1260	11096-82-5	µg/kg	294	--[b]	--
618-1_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,550	11,726	No
618-1_Deep	non-Rad	Barium	7440-39-3	µg/kg	299,000	--[b]	--
618-1_Deep	non-Rad	Beryllium	7440-41-7	µg/kg	218	--[b]	--
618-1_Deep	non-Rad	Boron	7440-42-8	µg/kg	1,360	--[e]	--
618-1_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	263	176,066	No
618-1_Deep	non-Rad	Chromium	7440-47-3	µg/kg	7,740	--[b]	--

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-1_Deep	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	--[b]	--
618-1_Deep	non-Rad	Copper	7440-50-8	µg/kg	46,300	3.40E+06	No
618-1_Deep	non-Rad	Fluoride	16984-48-8	µg/kg	2,800	--[b]	--
618-1_Deep	non-Rad	Iron	7439-89-6	µg/kg	2.47E+07	1.43E+08	No
618-1_Deep	non-Rad	Lead	7439-92-1	µg/kg	58,400	1.48E+06	No
618-1_Deep	non-Rad	Lithium	7439-93-2	µg/kg	5,980	--[e]	--
618-1_Deep	non-Rad	Manganese	7439-96-5	µg/kg	352,000	--[b]	--
618-1_Deep	non-Rad	Mercury	7439-97-6	µg/kg	1,180	8,451	No
618-1_Deep	non-Rad	Molybdenum	7439-98-7	µg/kg	493	--[b]	--
618-1_Deep	non-Rad	Nickel	7440-02-0	µg/kg	17,600	--[b]	--
618-1_Deep	non-Rad	Nitrate	14797-55-8	µg/kg	1,700	1.36E+07	No
618-1_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	220	3.03E+06	No
618-1_Deep	non-Rad	Uranium	7440-61-1	µg/kg	37,400	2.64E+06[c]	No
618-1_Deep	non-Rad	Vanadium	7440-62-2	µg/kg	73,000	--[e]	--
618-1_Deep	non-Rad	Zinc	7440-66-6	µg/kg	134,000	6.41E+07	No
618-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.46	--[b]	--
618-1_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	33	--[d]	--
618-1_Deep	Rad	Uranium-235	15117-96-1	pCi/g	2.7	--[d]	--
618-1_Deep	Rad	Uranium-238	U-238	pCi/g	32	--[d]	--
618-1_Deep_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.57E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	407	252,032	No
618-1_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1.24E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	99	--[b]	--
618-1_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,580	11,726	No
618-1_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	1.87E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	323	--[b]	--
618-1_Deep_Focused	non-Rad	Boron	7440-42-8	µg/kg	6,620	--[e]	--
618-1_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,030	176,066	No
618-1_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	18,900	--[b]	--
618-1_Deep_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,920	--[b]	--
618-1_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	68,700	3.40E+06	No
618-1_Deep_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	3,300	--[b]	--
618-1_Deep_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.41E+07	1.43E+08	No
618-1_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	333,000	1.48E+06	No
618-1_Deep_Focused	non-Rad	Lithium	7439-93-2	µg/kg	8,450	--[e]	--
618-1_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	351,000	--[b]	--
618-1_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	8,940	8,451	Yes
618-1_Deep_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	2,140	--[b]	--
618-1_Deep_Focused	non-Rad	Nickel	7440-02-0	µg/kg	13,700	--[b]	--
618-1_Deep_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	11,900	1.36E+07	No
618-1_Deep_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,560	3.03E+06	No
618-1_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,290	--[b]	--
618-1_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	209,000	2.64E+06[c]	No
618-1_Deep_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	70,900	--[e]	--
618-1_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	82,000	6.41E+07	No
618-1_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	6.5	--[b]	--
618-1_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	70	--[d]	--
618-1_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.5	--[d]	--
618-1_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	65	--[d]	--
618-1_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.21E+06	--[b]	--
618-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	264	--[b]	--
618-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	54	--[b]	--
618-1_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,280	11,726	No
618-1_Shallow	non-Rad	Barium	7440-39-3	µg/kg	97,200	--[b]	--
618-1_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	188	--[b]	--
618-1_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,190	--[e]	--
618-1_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	68	176,066	No
618-1_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,930	--[b]	--
618-1_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,360	--[b]	--
618-1_Shallow	non-Rad	Copper	7440-50-8	µg/kg	11,400	3.40E+06	No
618-1_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	400	--[b]	--
618-1_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07	1.43E+08	No
618-1_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,100	1.48E+06	No
618-1_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	6,380	--[e]	--
618-1_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	300,000	--[b]	--
618-1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	31	8,451	No
618-1_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	336	--[b]	--
618-1_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,150	--[b]	--
618-1_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	1,600	1.36E+07	No
618-1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	300	3.03E+06	No
618-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,224	2.64E+06[c]	No
618-1_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	56,300	--[e]	--
618-1_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	42,100	6.41E+07	No
618-1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	--[d]	--
618-1_Shallow	Rad	Uranium-238	U-238	pCi/g	1.5	--[d]	--
618-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	1.22E+07	--[b]	--
618-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	455	252,032	No
618-1_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	35	133	No
618-1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	981	--[b]	--
618-1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	56	--[b]	--
618-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	6,090	11,726	No
618-1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	102,000	--[b]	--

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	371	--[b]	--
618-1_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	3,740	--[e]	--
618-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	266	176,066	No
618-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	19,500	--[b]	--
618-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	--[b]	--
618-1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	23,800	3.40E+06	No
618-1_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	900	--[b]	--
618-1_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.28E+07	1.43E+08	No
618-1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,210	1.48E+06	No
618-1_Shallow_Focused	non-Rad	Lithium	7439-93-2	µg/kg	13,300	--[e]	--
618-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	403,000	--[b]	--
618-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	198	8,451	No
618-1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	356	--[b]	--
618-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	16,800	--[b]	--
618-1_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	3,800	1.36E+07	No
618-1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	260	3.03E+06	No
618-1_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,120	--[b]	--
618-1_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	7,080	2.64E+06[c]	No
618-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	64,700	--[e]	--
618-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	68,100	6.41E+07	No
618-1_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-1_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.99	--[d]	--
618-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	8.2	--[d]	--
618-12_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	8,557	11,726	No
618-12_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	63	--[b]	--
618-12_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	60	1.50E+06	No
618-12_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	32,092	2.64E+06[c]	No
618-12_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.47	--[d]	--
618-12_Shallow	Rad	Uranium-238	U-238	pCi/g	11	--[d]	--
618-13_Shallow	non-Rad	Acetone	67-64-1	µg/kg	8.6	2.28E+08	No
618-13_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.34E+06	--[b]	--
618-13_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	312	252,032	No
618-13_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,500	11,726	No
618-13_Shallow	non-Rad	Barium	7440-39-3	µg/kg	74,000	--[b]	--
618-13_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	212	--[b]	--
618-13_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,050	--[e]	--
618-13_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	63	176,066	No
618-13_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,700	--[b]	--
618-13_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,290	--[b]	--
618-13_Shallow	non-Rad	Copper	7440-50-8	µg/kg	11,500	3.40E+06	No
618-13_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.01E+07	1.43E+08	No
618-13_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,620	1.48E+06	No
618-13_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	344,000	--[b]	--
618-13_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	5.1	1,931	No
618-13_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	420	--[b]	--
618-13_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,400	--[b]	--
618-13_Shallow	non-Rad	Tin	7440-31-5	µg/kg	1,050	--[b]	--
618-13_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,750	2.64E+06[c]	No
618-13_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	55,800	--[e]	--
618-13_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,400	6.41E+07	No
618-13_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.038	--[b]	--
618-13_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	--[d]	--
618-13_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
618-13_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	5.9	2.28E+08	No
618-13_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.22E+06	--[b]	--
618-13_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	233	252,032	No
618-13_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,390	11,726	No
618-13_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	57,700	--[b]	--
618-13_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	184	--[b]	--
618-13_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	960	--[e]	--
618-13_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	47	176,066	No
618-13_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,740	--[b]	--
618-13_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,710	--[b]	--
618-13_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,100	3.40E+06	No
618-13_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	150	6,000[f]	No
618-13_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.79E+07	1.43E+08	No
618-13_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	4,940	1.48E+06	No
618-13_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	268,000	--[b]	--
618-13_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	5.0	1,931	No
618-13_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	297	--[b]	--
618-13_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000	--[b]	--
618-13_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	745	--[b]	--
618-13_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	1,500	2.64E+06[c]	No
618-13_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	48,600	--[e]	--
618-13_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	37,100	6.41E+07	No
618-13_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
618-13_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.96	--[d]	--
618-2_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	1,500	11,726	No
618-2_Deep	non-Rad	Barium	7440-39-3	µg/kg	83,300	--[b]	--
618-2_Deep	non-Rad	Chromium	7440-47-3	µg/kg	6,700	--[b]	--
618-2_Deep	non-Rad	Lead	7439-92-1	µg/kg	6,600	1.48E+06	No
618-2_Deep	non-Rad	Selenium	7782-49-2	µg/kg	780	302,457	No

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-2_Deep	non-Rad	Tin	7440-31-5	µg/kg	2,900	--[b]	--
618-2_Deep	non-Rad	Uranium	7440-61-1	µg/kg	501,000	2.64E+06[c]	No
618-2_Deep	Rad	Americium-241	14596-10-2	pCi/g	7.9	--[b]	--
618-2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	1.0	--[b]	--
618-2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	1.5	--[b]	--
618-2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	91	--[b]	--
618-2_Deep	Rad	Plutonium-241	14119-32-5	pCi/g	42	--[b]	--
618-2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	12	227,428	No
618-2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	161	--[d]	--
618-2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.78	--[d]	--
618-2_Deep	Rad	Uranium-238	U-238	pCi/g	165	--[d]	--
618-2_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	6.9	--[b]	--
618-2_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,300	11,726	No
618-2_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	109,000	--[b]	--
618-2_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	27	--[b]	--
618-2_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	200	176,066	No
618-2_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,400	--[b]	--
618-2_Deep_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	18	3.56E+07	No
618-2_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,800	1.48E+06	No
618-2_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	1,200	302,457	No
618-2_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	600	--[b]	--
618-2_Deep_Focused	non-Rad	Tin	7440-31-5	µg/kg	42,500	--[b]	--
618-2_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	148,000	2.64E+06[c]	No
618-2_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	9.2	--[b]	--
618-2_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.1	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-238	13981-16-3	pCi/g	1.6	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	92	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-241	14119-32-5	pCi/g	33	--[b]	--
618-2_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	7.2	227,428	No
618-2_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	48	--[d]	--
618-2_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	2.4	--[d]	--
618-2_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	50	--[d]	--
618-2_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	11,726	No
618-2_Overburden	non-Rad	Barium	7440-39-3	µg/kg	74,700	--[b]	--
618-2_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	6,600	--[b]	--
618-2_Overburden	non-Rad	Lead	7439-92-1	µg/kg	4,300	1.48E+06	No
618-2_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	1,000	302,457	No
618-2_Overburden	non-Rad	Tin	7440-31-5	µg/kg	2,700	--[b]	--
618-2_Overburden	non-Rad	Uranium	7440-61-1	µg/kg	1,140	2.64E+06[c]	No
618-2_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.058	--[b]	--
618-2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.64	--[d]	--
618-2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.59	--[d]	--
618-2_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	1,900	11,726	No
618-2_Shallow	non-Rad	Barium	7440-39-3	µg/kg	79,100	--[b]	--
618-2_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,100	--[b]	--
618-2_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,600	1.48E+06	No
618-2_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	760	302,457	No
618-2_Shallow	non-Rad	Tin	7440-31-5	µg/kg	2,400	--[b]	--
618-2_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	4,530	2.64E+06[c]	No
618-2_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.81	--[b]	--
618-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.2	--[b]	--
618-2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	7.7	--[b]	--
618-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.2	--[d]	--
618-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.21	--[d]	--
618-2_Shallow	Rad	Uranium-238	U-238	pCi/g	2.2	--[d]	--
618-2_Staging Pile	non-Rad	Arsenic	7440-38-2	µg/kg	3,063	11,726	No
618-2_Staging Pile	non-Rad	Barium	7440-39-3	µg/kg	67,690	--[b]	--
618-2_Staging Pile	non-Rad	Chromium	7440-47-3	µg/kg	6,424	--[b]	--
618-2_Staging Pile	non-Rad	Lead	7439-92-1	µg/kg	4,011	1.48E+06	No
618-2_Staging Pile	non-Rad	Uranium	7440-61-1	µg/kg	5,022	2.64E+06[c]	No
618-2_Staging Pile	Rad	Americium-241	14596-10-2	pCi/g	0.82	--[b]	--
618-2_Staging Pile	Rad	Cesium-137	10045-97-3	pCi/g	0.095	--[b]	--
618-2_Staging Pile	Rad	Plutonium-239/240	PU-239/240	pCi/g	10	--[b]	--
618-2_Staging Pile	Rad	Tritium	10028-17-8	pCi/g	2.3	9,176	No
618-2_Staging Pile	Rad	Uranium-233/234	U-233/234	pCi/g	2.0	--[d]	--
618-2_Staging Pile	Rad	Uranium-235	15117-96-1	pCi/g	0.12	--[d]	--
618-2_Staging Pile	Rad	Uranium-238	U-238	pCi/g	2.0	--[d]	--
618-3_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,800	11,726	No
618-3_Shallow	non-Rad	Barium	7440-39-3	µg/kg	76,500	--[b]	--
618-3_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,700	--[b]	--
618-3_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,900	1.48E+06	No
618-3_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	659	302,457	No
618-3_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,610	2.64E+06[c]	No
618-3_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.68	--[d]	--
618-3_Shallow	Rad	Uranium-238	U-238	pCi/g	0.75	--[d]	--
618-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	238,577	2.64E+06[c]	No
618-3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	80	--[d]	--
618-3_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.8	--[d]	--
618-3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	79	--[d]	--
618-4_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,200	11,726	No
618-4_Deep	non-Rad	Lead	7439-92-1	µg/kg	20,000	1.48E+06	No

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	64,506	2.64E+06[c]	No
618-4_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	20	--[d]	--
618-4_Deep	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
618-4_Deep	Rad	Uranium-238	U-238	pCi/g	22	--[d]	--
618-4_Deep_Focused	non-Rad	2-Butanone	78-93-3	µg/kg	130	1.71E+08	No
618-4_Deep_Focused	non-Rad	Acetone	67-64-1	µg/kg	16	2.28E+08	No
618-4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,600	--[b]	--
618-4_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	11,726	No
618-4_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	104,000	--[b]	--
618-4_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	4,700	--[b]	--
618-4_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,500	176,066	No
618-4_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	27,700	--[b]	--
618-4_Deep_Focused	non-Rad	Diethyl ether	60-29-7	µg/kg	1.0	3.98E+07	No
618-4_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	24,900	1.48E+06	No
618-4_Deep_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	40	1,931	No
618-4_Deep_Focused	non-Rad	Phenol	108-95-2	µg/kg	110	6.21E+06	No
618-4_Deep_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	24	1,316	No
618-4_Deep_Focused	non-Rad	Toluene	108-88-3	µg/kg	4.8	2.35E+06	No
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	34,000	--[e]	--
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - kerosene range	TPHKEROSENE	µg/kg	42,000	--[e]	--
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	65	--[e]	--
618-4_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	20,777	2.64E+06[c]	No
618-4_Deep_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	3,511	No
618-4_Deep_Focused	non-Rad	Trichloromonofluoromethane	75-69-4	µg/kg	12	2.90E+07	No
618-4_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	7.2	--[d]	--
618-4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.51	--[d]	--
618-4_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	6.9	--[d]	--
618-4_Overburden_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,500	11,726	No
618-4_Overburden_2	non-Rad	Lead	7439-92-1	µg/kg	4,700	1.48E+06	No
618-4_Overburden_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,197	2.64E+06[c]	No
618-4_Overburden_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
618-4_Overburden_2	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
618-4_Overburden_3	non-Rad	Lead	7439-92-1	µg/kg	5,000	1.48E+06	No
618-4_Overburden_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,171	2.64E+06[c]	No
618-4_Overburden_3	Rad	Uranium-233/234	U-233/234	pCi/g	0.42	--[d]	--
618-4_Overburden_3	Rad	Uranium-235	15117-96-1	pCi/g	0.032	--[d]	--
618-4_Overburden_3	Rad	Uranium-238	U-238	pCi/g	0.44	--[d]	--
618-4_Overburden_4	non-Rad	Lead	7439-92-1	µg/kg	4,800	1.48E+06	No
618-4_Overburden_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,323	2.64E+06[c]	No
618-4_Overburden_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.94	--[d]	--
618-4_Overburden_4	Rad	Uranium-238	U-238	pCi/g	0.94	--[d]	--
618-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,200	11,726	No
618-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	49,000	1.48E+06	No
618-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	7,456	2.64E+06[c]	No
618-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	3.2	--[d]	--
618-4_Shallow	Rad	Uranium-238	U-238	pCi/g	3.1	--[d]	--
618-5_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	5,200	11,726	No
618-5_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	470	176,066	No
618-5_Deep	non-Rad	Chromium	7440-47-3	µg/kg	14,700	--[b]	--
618-5_Deep	non-Rad	Lead	7439-92-1	µg/kg	82,300	1.48E+06	No
618-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	26,618	2.64E+06[c]	No
618-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	8.6	--[d]	--
618-5_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.46	--[d]	--
618-5_Deep	Rad	Uranium-238	U-238	pCi/g	8.9	--[d]	--
618-5_Deep_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.65E+06	--[b]	--
618-5_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	1,800	252,032	No
618-5_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,500	11,726	No
618-5_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	106,000	--[b]	--
618-5_Deep_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	672	--[b]	--
618-5_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,500	--[b]	--
618-5_Deep_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	10,500	--[b]	--
618-5_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	21,400	3.40E+06	No
618-5_Deep_Focused	non-Rad	Iron	7439-89-6	µg/kg	3.02E+07	1.43E+08	No
618-5_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,600	1.48E+06	No
618-5_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	579,000	--[b]	--
618-5_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	33	8,451	No
618-5_Deep_Focused	non-Rad	Nickel	7440-02-0	µg/kg	11,300	--[b]	--
618-5_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	2,270	302,457	No
618-5_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	36,540	2.64E+06[c]	No
618-5_Deep_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	79,500	--[e]	--
618-5_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	65,800	6.41E+07	No
618-5_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-5_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.48	--[d]	--
618-5_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	12	--[d]	--
618-5_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,400	11,726	No
618-5_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	170	176,066	No
618-5_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	9,700	--[b]	--
618-5_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,500	1.48E+06	No
618-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	9,773	2.64E+06[c]	No
618-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	4.1	--[d]	--
618-5_Overburden	Rad	Uranium-238	U-238	pCi/g	4.6	--[d]	--
618-5_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,300	11,726	No
618-5_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,300	--[b]	--

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-5_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,100	1.48E+06	No
618-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,849	2.64E+06[c]	No
618-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.94	--[d]	--
618-5_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
618-5_Staging Pile_4	non-Rad	Arsenic	7440-38-2	µg/kg	3,300	11,726	No
618-5_Staging Pile_4	non-Rad	Cadmium	7440-43-9	µg/kg	50	176,066	No
618-5_Staging Pile_4	non-Rad	Chromium	7440-47-3	µg/kg	11,800	--[b]	--
618-5_Staging Pile_4	non-Rad	Lead	7439-92-1	µg/kg	5,300	1.48E+06	No
618-5_Staging Pile_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,364	2.64E+06[c]	No
618-5_Staging Pile_4	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	--[d]	--
618-5_Staging Pile_4	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
618-5_Staging Pile_5	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	11,726	No
618-5_Staging Pile_5	non-Rad	Chromium	7440-47-3	µg/kg	10,300	--[b]	--
618-5_Staging Pile_5	non-Rad	Lead	7439-92-1	µg/kg	3,900	1.48E+06	No
618-5_Staging Pile_5	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,326	2.64E+06[c]	No
618-5_Staging Pile_5	Rad	Uranium-233/234	U-233/234	pCi/g	1.5	--[d]	--
618-5_Staging Pile_5	Rad	Uranium-235	15117-96-1	pCi/g	0.17	--[d]	--
618-5_Staging Pile_5	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
618-7_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	5.25E+06	--[b]	--
618-7_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	560	252,032	No
618-7_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	1,891	11,726	No
618-7_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	68,874	--[b]	--
618-7_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	278	--[b]	--
618-7_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	65	176,066	No
618-7_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	10,227	--[b]	--
618-7_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	9,152	--[b]	--
618-7_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	16,120	3.40E+06	No
618-7_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	2.60E+07	1.43E+08	No
618-7_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	14,567	1.48E+06	No
618-7_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	326,067	--[b]	--
618-7_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	44	8,451	No
618-7_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	20,977	--[b]	--
618-7_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,547	--[b]	--
618-7_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	10,814	2.64E+06[c]	No
618-7_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	74,576	--[e]	--
618-7_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	49,177	6.41E+07	No
618-7_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.067	--[b]	--
618-7_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	3.6	--[d]	--
618-7_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	0.36	--[d]	--
618-7_Shallow_1	Rad	Uranium-238	U-238	pCi/g	3.6	--[d]	--
618-7_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	4.97E+06	--[b]	--
618-7_Shallow_2	non-Rad	Antimony	7440-36-0	µg/kg	660	252,032	No
618-7_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,500	11,726	No
618-7_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	73,800	--[b]	--
618-7_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	440	--[b]	--
618-7_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	6,800	--[b]	--
618-7_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	9,300	--[b]	--
618-7_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	13,600	3.40E+06	No
618-7_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	2.60E+07	1.43E+08	No
618-7_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	2,800	1.48E+06	No
618-7_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	364,000	--[b]	--
618-7_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	20	8,451	No
618-7_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	9,700	--[b]	--
618-7_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,500	--[b]	--
618-7_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,574	2.64E+06[c]	No
618-7_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	74,700	--[e]	--
618-7_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	46,200	6.41E+07	No
618-7_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.57	--[d]	--
618-7_Shallow_2	Rad	Uranium-238	U-238	pCi/g	0.53	--[d]	--
618-7_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	6.74E+06	--[b]	--
618-7_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	450	252,032	No
618-7_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	2,800	11,726	No
618-7_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	82,500	--[b]	--
618-7_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	310	--[b]	--
618-7_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	190	176,066	No
618-7_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	10,100	--[b]	--
618-7_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	--[b]	--
618-7_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	13,600	3.40E+06	No
618-7_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.43E+07	1.43E+08	No
618-7_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	4,300	1.48E+06	No
618-7_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	357,000	--[b]	--
618-7_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	20	8,451	No
618-7_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	10,100	--[b]	--
618-7_Shallow_3	non-Rad	Tin	7440-31-5	µg/kg	1,800	--[b]	--
618-7_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,852	2.64E+06[c]	No
618-7_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	68,200	--[e]	--
618-7_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	44,500	6.41E+07	No
618-7_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
618-7_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.085	--[d]	--
618-7_Shallow_3	Rad	Uranium-238	U-238	pCi/g	0.95	--[d]	--
618-7_Shallow_4	non-Rad	Aluminum	7429-90-5	µg/kg	5.65E+06	--[b]	--
618-7_Shallow_4	non-Rad	Antimony	7440-36-0	µg/kg	250	252,032	No

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-7_Shallow_4	non-Rad	Arsenic	7440-38-2	µg/kg	5,200	11,726	No
618-7_Shallow_4	non-Rad	Barium	7440-39-3	µg/kg	57,900	--[b]	--
618-7_Shallow_4	non-Rad	Beryllium	7440-41-7	µg/kg	220	--[b]	--
618-7_Shallow_4	non-Rad	Cadmium	7440-43-9	µg/kg	90	176,066	No
618-7_Shallow_4	non-Rad	Chromium	7440-47-3	µg/kg	11,400	--[b]	--
618-7_Shallow_4	non-Rad	Cobalt	7440-48-4	µg/kg	6,700	--[b]	--
618-7_Shallow_4	non-Rad	Copper	7440-50-8	µg/kg	13,200	3.40E+06	No
618-7_Shallow_4	non-Rad	Iron	7439-89-6	µg/kg	2.12E+07	1.43E+08	No
618-7_Shallow_4	non-Rad	Lead	7439-92-1	µg/kg	3,000	1.48E+06	No
618-7_Shallow_4	non-Rad	Manganese	7439-96-5	µg/kg	285,000	--[b]	--
618-7_Shallow_4	non-Rad	Nickel	7440-02-0	µg/kg	12,900	--[b]	--
618-7_Shallow_4	non-Rad	Tin	7440-31-5	µg/kg	710	--[b]	--
618-7_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,064	2.64E+06[c]	No
618-7_Shallow_4	non-Rad	Vanadium	7440-62-2	µg/kg	54,800	--[e]	--
618-7_Shallow_4	non-Rad	Zinc	7440-66-6	µg/kg	37,000	6.41E+07	No
618-7_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.69	--[d]	--
618-7_Shallow_4	Rad	Uranium-238	U-238	pCi/g	0.76	--[d]	--
618-7_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	150	4.94E+07	No
618-7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.61E+06	--[b]	--
618-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	980	252,032	No
618-7_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	6.7	133	No
618-7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,200	11,726	No
618-7_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	92,800	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	88	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	66	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	52	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	11	--[b]	--
618-7_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	370	--[b]	--
618-7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	470	--[b]	--
618-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	6,200	176,066	No
618-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	65,900	--[b]	--
618-7_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	69	--[b]	--
618-7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,000	--[b]	--
618-7_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	25,000	3.40E+06	No
618-7_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	45	--[b]	--
618-7_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	33	3.56E+07	No
618-7_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	48	2.82E+08	No
618-7_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.87E+07	1.43E+08	No
618-7_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,500	1.48E+06	No
618-7_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	425,000	--[b]	--
618-7_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	20	8,451	No
618-7_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	17,200	--[b]	--
618-7_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	410	--[b]	--
618-7_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,200	--[b]	--
618-7_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	680,000	--[e]	--
618-7_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	19,563	2.64E+06[c]	No
618-7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	80,500	--[e]	--
618-7_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	52,400	6.41E+07	No
618-7_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.010	--[b]	--
618-7_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-7_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.97	--[d]	--
618-7_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	6.4	--[d]	--
618-8_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,100	11,726	No
618-8_Shallow	non-Rad	Barium	7440-39-3	µg/kg	97,600	--[b]	--
618-8_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	12,400	--[b]	--
618-8_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,100	1.48E+06	No
618-8_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	846	302,457	No
618-8_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,720	2.64E+06[c]	No
618-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	--[d]	--
618-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.73	--[d]	--
618-9_Shallow_Focused	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	110	210	No
618-9_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	680	2.28E+08	No
618-9_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	390	148	Yes
618-9_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.57E+06	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1016	12674-11-2	µg/kg	1,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1221	11104-28-2	µg/kg	1,900	17	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1232	11141-16-5	µg/kg	1,900	17	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1242	53469-21-9	µg/kg	1,900	143	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,900	133	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	11,600	11,726	No
618-9_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	90,200	--[b]	--
618-9_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	330	--[b]	--
618-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	5,200	--[b]	--
618-9_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	2,700	1.50E+06	No
618-9_Shallow_Focused	non-Rad	Chlordane	57-74-9	µg/kg	69	--[b]	--
618-9_Shallow_Focused	non-Rad	Chloroform	67-66-3	µg/kg	9.0	5,207	No
618-9_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,700	--[b]	--
618-9_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,400	--[b]	--
618-9_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	16,700	3.40E+06	No
618-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	7,200	3.56E+07	No
618-9_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	44	--[b]	--

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-9_Shallow_Focused	non-Rad	Hexachlorobutadiene	87-68-3	µg/kg	760	--[b]	--
618-9_Shallow_Focused	non-Rad	Hexachloroethane	67-72-1	µg/kg	17,000	29,166	No
618-9_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.49E+07	1.43E+08	No
618-9_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	7,700	1.48E+06	No
618-9_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	359,000	--[b]	--
618-9_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	330	8,451	No
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	1,931	Yes
618-9_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,600	--[b]	--
618-9_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	1.67E+06	1.36E+07	No
618-9_Shallow_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	920	1,316	No
618-9_Shallow_Focused	non-Rad	Toluene	108-88-3	µg/kg	9.0	2.35E+06	No
618-9_Shallow_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	3,511	No
618-9_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	3,100	2.64E+06[c]	No
618-9_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	59,300	--[e]	--
618-9_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	52,300	6.41E+07	No
618-9_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.071	--[d]	--
618-9_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	3.0	--[d]	--
628-4_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,374	11,726	No
628-4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	61	--[b]	--
628-4_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,284	1.48E+06	No
628-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,308	2.64E+06[c]	No
628-4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.033	--[b]	--
628-4_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.87	--[d]	--
628-4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.78	--[d]	--
628-4_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	42	143	No
628-4_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,115	133	Yes
628-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	243	--[b]	--
628-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	38	--[b]	--
628-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,864	11,726	No
628-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	99,167	1.48E+06	No
628-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,163	2.64E+06[c]	No
628-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
628-4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.11	--[d]	--
628-4_Shallow	Rad	Uranium-238	U-238	pCi/g	1.0	--[d]	--
UPR-300-17_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	117	4.94E+07	No
UPR-300-17_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.34E+06	--[b]	--
UPR-300-17_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	7.0	--[b]	--
UPR-300-17_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	359	252,032	No
UPR-300-17_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,970	133	Yes
UPR-300-17_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	450	--[b]	--
UPR-300-17_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	113	--[b]	--
UPR-300-17_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,573	11,726	No
UPR-300-17_Shallow	non-Rad	Barium	7440-39-3	µg/kg	81,014	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	59	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	44	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	33	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	9.9	--[b]	--
UPR-300-17_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	240	--[b]	--
UPR-300-17_Shallow	non-Rad	Boron	7440-42-8	µg/kg	3,903	--[e]	--
UPR-300-17_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	173	176,066	No
UPR-300-17_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	13,795	--[b]	--
UPR-300-17_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	39	--[b]	--
UPR-300-17_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,688	--[b]	--
UPR-300-17_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,135	3.40E+06	No
UPR-300-17_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	35	2.82E+08	No
UPR-300-17_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.9	1.06E+08	No
UPR-300-17_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	5.9	--[b]	--
UPR-300-17_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07	1.43E+08	No
UPR-300-17_Shallow	non-Rad	Lead	7439-92-1	µg/kg	11,240	1.48E+06	No
UPR-300-17_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	285,159	--[b]	--
UPR-300-17_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	69	8,451	No
UPR-300-17_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	412	--[b]	--
UPR-300-17_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	48	6.97E+07	No
UPR-300-17_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	563,654	--[b]	--
UPR-300-17_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	34	--[b]	--
UPR-300-17_Shallow	non-Rad	Silver	7440-22-4	µg/kg	340	--[b]	--
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,950	--[e]	--
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	210,420	--[e]	--
UPR-300-17_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,420	2.64E+06[c]	No
UPR-300-17_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	52,150	--[e]	--
UPR-300-17_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	157,172	6.41E+07	No
UPR-300-17_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	6.1	--[d]	--
UPR-300-17_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.91	--[d]	--
UPR-300-17_Shallow	Rad	Uranium-238	U-238	pCi/g	4.0	--[d]	--
UPR-300-46_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	13	4.94E+07	No
UPR-300-46_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.80E+06	--[b]	--
UPR-300-46_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	381	252,032	No
UPR-300-46_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	879	133	Yes
UPR-300-46_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	490	--[b]	--
UPR-300-46_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	84	--[b]	--
UPR-300-46_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,846	11,726	No
UPR-300-46_Shallow	non-Rad	Barium	7440-39-3	µg/kg	82,137	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	3.9	--[b]	--

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
UPR-300-46_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	5.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.8	--[b]	--
UPR-300-46_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	222	--[b]	--
UPR-300-46_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,714	--[e]	--
UPR-300-46_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	95	176,066	No
UPR-300-46_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,173	--[b]	--
UPR-300-46_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	5.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,361	--[b]	--
UPR-300-46_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,151	3.40E+06	No
UPR-300-46_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	1.3	--[b]	--
UPR-300-46_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	9.6	2.82E+08	No
UPR-300-46_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.2	1.06E+08	No
UPR-300-46_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	7.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07	1.43E+08	No
UPR-300-46_Shallow	non-Rad	Lead	7439-92-1	µg/kg	7,105	1.48E+06	No
UPR-300-46_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	311,001	--[b]	--
UPR-300-46_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	29	8,451	No
UPR-300-46_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	456	--[b]	--
UPR-300-46_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	36	6.97E+07	No
UPR-300-46_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,230	--[b]	--
UPR-300-46_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	4.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,897	2.64E+06[c]	No
UPR-300-46_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	53,808	--[e]	--
UPR-300-46_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	47,945	6.41E+07	No
UPR-300-46_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.070	--[b]	--
UPR-300-46_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.8	--[d]	--
UPR-300-46_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
UPR-300-46_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--

Notes:

a. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd ≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

b. The calculated soil screening level for the analyte is considered non-representative because: (1) breakthrough is simulated within 1,000 years for some soil columns while other soil columns (a majority) show no breakthrough (breakthrough defined as concentrations below 1E-04 µg/L or activity below 1E-04 pCi/L), and/or (2) the calculated residual mass of contaminant in the pore volume is high enough to represent a substantial (and physically improbable) reduction in porosity.

c. Due to the complex geochemistry of uranium in 300 Area source operable unit soils, uranium SSLs were derived using a site-speicific two-dimensional model as described in ECF-300FF5-11-0151.

d. Uranium isotopes are accounted for by converting from activity-based (pCi/g) to mass-based (µg/kg) concentrations and then summing to provide a mass-based total uranium exposure point concentration (identified as Total_U_Isotopes), as described in ECF-300NPL-11-0137, Computation of Exposure Point Concentrations for the 300-FF-2 Source Operable Unit.

e. A soil screening level is not calculated because a surface water cleanup level or surface water standard is not available for the analyte.

f. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

-- = Not applicable or no value

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
300 ASH PITS_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	52	--	--
300 ASH PITS_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,078	6,470	No
300 ASH PITS_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	96	--	--
300 ASH PITS_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	76	--	--
300 ASH PITS_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,450	3,210	No
300 ASH PITS_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.039	0.11	No
300 ASH PITS_Shallow	Rad	Uranium-238	U-238	pCi/g	0.82	1.1	No
300 VTS_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.029	1.1	No
300-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	13,500	6,470	Yes
300-10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	200	--	--
300-10_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	230	--	--
300-10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,078	3,210	Yes
300-10_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.16	1.1	No
300-10_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.041	0.11	No
300-10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	1.1	Yes
300-109_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.62E+06	1.18E+07	No
300-109_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	122	--	--
300-109_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	40	--	--
300-109_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,420	6,470	No
300-109_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	63,300	132,000	No
300-109_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.2	--	--
300-109_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	2.3	--	--
300-109_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	180	1,510	No
300-109_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	632	3,890	No
300-109_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	59	563	No
300-109_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,950	18,500	No
300-109_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	1.8	--	--
300-109_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	6,420	15,700	No
300-109_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,800	22,000	No
300-109_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	14	--	--
300-109_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.75E+07	3.26E+07	No
300-109_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,890	10,200	No
300-109_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	278,000	512,000	No
300-109_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	22	13	Yes
300-109_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	341	470	No
300-109_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,490	19,100	No
300-109_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	1.6	--	--
300-109_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,108	3,210	Yes
300-109_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	47,600	85,100	No
300-109_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	34,700	67,800	No
300-109_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	1.1	Yes
300-109_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	1.1	Yes
300-109_Staging Pile Area_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.78E+06	1.18E+07	No
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	37	--	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	19	--	--
300-109_Staging Pile Area_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,580	6,470	No
300-109_Staging Pile Area_Focused	non-Rad	Barium	7440-39-3	µg/kg	72,700	132,000	No
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	2.1	--	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.3	--	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.3	--	--
300-109_Staging Pile Area_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	203	1,510	No
300-109_Staging Pile Area_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,060	3,890	No
300-109_Staging Pile Area_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	66	563	No
300-109_Staging Pile Area_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,170	18,500	No
300-109_Staging Pile Area_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,950	15,700	No
300-109_Staging Pile Area_Focused	non-Rad	Copper	7440-50-8	µg/kg	11,600	22,000	No
300-109_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	5.1	--	--
300-109_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	29	--	--
300-109_Staging Pile Area_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.84E+07	3.26E+07	No
300-109_Staging Pile Area_Focused	non-Rad	Lead	7439-92-1	µg/kg	5,030	10,200	No
300-109_Staging Pile Area_Focused	non-Rad	Manganese	7439-96-5	µg/kg	286,000	512,000	No
300-109_Staging Pile Area_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	408	470	No
300-109_Staging Pile Area_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,570	19,100	No
300-109_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	µg/kg	7.0	--	--
300-109_Staging Pile Area_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,450	--	--
300-109_Staging Pile Area_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,877	3,210	Yes
300-109_Staging Pile Area_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	45,100	85,100	No
300-109_Staging Pile Area_Focused	non-Rad	Zinc	7440-66-6	µg/kg	48,800	67,800	No
300-109_Staging Pile Area_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	2.5	1.1	Yes
300-109_Staging Pile Area_Focused	Rad	Uranium-238	U-238	pCi/g	2.3	1.1	Yes
300-18_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,200	6,470	No
300-18_Shallow	non-Rad	Barium	7440-39-3	µg/kg	63,400	132,000	No
300-18_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	650	1,510	No
300-18_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	40	563	No
300-18_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	6,900	18,500	No
300-18_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,600	10,200	No
300-18_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,136	3,210	No
300-18_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.65	1.1	No
300-18_Shallow	Rad	Uranium-238	U-238	pCi/g	0.41	1.1	No
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	120,000	--	--
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	230,000	--	--
300-23_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	52,000	--	--
300-259_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	5.99E+06	1.18E+07	No
300-259_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	322	130	Yes
300-259_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,096	6,470	No
300-259_Shallow	non-Rad	Barium	7440-39-3	µg/kg	75,232	132,000	No
300-259_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	226	1,510	No
300-259_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,303	3,890	No
300-259_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	252	563	No
300-259_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,901	18,500	No
300-259_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	5,831	15,700	No
300-259_Shallow	non-Rad	Copper	7440-50-8	µg/kg	10,692	22,000	No
300-259_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	3.26E+07	No
300-259_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,625	10,200	No
300-259_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	318,874	512,000	No
300-259_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	10	13	No
300-259_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	303	470	No
300-259_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,751	19,100	No
300-259_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,876	3,210	Yes
300-259_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	42,626	85,100	No

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
300-259_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	479,584	67,800	Yes
300-259_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.6	1.1	Yes
300-259_Shallow	Rad	Uranium-238	U-238	pCi/g	1.3	1.1	Yes
300-260_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.17E+06	1.18E+07	No
300-260_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	922	130	Yes
300-260_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,160	6,470	No
300-260_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	122,000	132,000	No
300-260_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	239	1,510	No
300-260_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	8,360	3,890	Yes
300-260_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	110	563	No
300-260_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,890	18,500	No
300-260_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,430	15,700	No
300-260_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	73,300	22,000	Yes
300-260_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.04E+07	3.26E+07	No
300-260_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	18,300	10,200	Yes
300-260_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	328,000	512,000	No
300-260_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	12	13	No
300-260_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	537	470	Yes
300-260_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,200	19,100	No
300-260_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	206	167	Yes
300-260_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,800	3,210	Yes
300-260_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	59,000	85,100	No
300-260_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	77,400	67,800	Yes
300-260_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.25	0.11	Yes
300-260_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	4.3	1.1	Yes
300-272_Overburden_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	13,100	--	--
300-272_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	43,100	--	--
300-275_Shallow_1	non-Rad	Acenaphthene	83-32-9	µg/kg	960	--	--
300-275_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	5.61E+06	1.18E+07	No
300-275_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	260	130	Yes
300-275_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	2,211	6,470	No
300-275_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	75,261	132,000	No
300-275_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.3	--	--
300-275_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.9	--	--
300-275_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	452	1,510	No
300-275_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	1,466	3,890	No
300-275_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	83	563	No
300-275_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	8,022	18,500	No
300-275_Shallow_1	non-Rad	Chrysene	218-01-9	µg/kg	2.2	--	--
300-275_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	5,847	15,700	No
300-275_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	42,923	22,000	Yes
300-275_Shallow_1	non-Rad	Fluoranthene	206-44-0	µg/kg	2,300	--	--
300-275_Shallow_1	non-Rad	Fluorene	86-73-7	µg/kg	81	--	--
300-275_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	1.79E+07	3.26E+07	No
300-275_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	7,189	10,200	No
300-275_Shallow_1	non-Rad	Lithium	7439-93-2	µg/kg	6,686	13,300	No
300-275_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	276,815	512,000	No
300-275_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	17	13	Yes
300-275_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	378	470	No
300-275_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	9,461	19,100	No
300-275_Shallow_1	non-Rad	Silver	7440-22-4	µg/kg	121	167	No
300-275_Shallow_1	non-Rad	Strontium	7440-24-6	µg/kg	20,196	--	--
300-275_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,483	--	--
300-275_Shallow_1	non-Rad	Uranium	7440-61-1	µg/kg	2,500	3,210	No
300-275_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	45,128	85,100	No
300-275_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	41,014	67,800	No
300-275_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.046	1.1	No
300-275_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	7.7	1.1	Yes
300-275_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.0	0.11	Yes
300-275_Shallow_1	Rad	Uranium-238	U-238	pCi/g	7.4	1.1	Yes
300-275_Shallow_2	non-Rad	Acenaphthene	83-32-9	µg/kg	3.6	--	--
300-275_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	6.24E+06	1.18E+07	No
300-275_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,761	6,470	No
300-275_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	68,607	132,000	No
300-275_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	254	1,510	No
300-275_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	1,147	3,890	No
300-275_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	144	563	No
300-275_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	8,994	18,500	No
300-275_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	5,977	15,700	No
300-275_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	11,596	22,000	No
300-275_Shallow_2	non-Rad	Fluoranthene	206-44-0	µg/kg	56	--	--
300-275_Shallow_2	non-Rad	Fluorene	86-73-7	µg/kg	2.6	--	--
300-275_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	3.26E+07	No
300-275_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	4,099	10,200	No
300-275_Shallow_2	non-Rad	Lithium	7439-93-2	µg/kg	7,067	13,300	No
300-275_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	292,731	512,000	No
300-275_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	28	13	Yes
300-275_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	404	470	No
300-275_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	9,593	19,100	No
300-275_Shallow_2	non-Rad	Strontium	7440-24-6	µg/kg	27,081	--	--
300-275_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,149	--	--
300-275_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,725	3,210	Yes
300-275_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	51,632	85,100	No
300-275_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	41,245	67,800	No
300-275_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	1.1	Yes
300-275_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	0.24	0.11	Yes
300-275_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.2	1.1	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.32E+06	1.18E+07	No
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1016	12674-11-2	µg/kg	10	--	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	16	--	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	190	--	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	84	--	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	17	--	--
300-33, 300-41, 300-256_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,638	6,470	No
300-33, 300-41, 300-256_Shallow	non-Rad	Barium	7440-39-3	µg/kg	72,411	132,000	No
300-33, 300-41, 300-256_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	256	1,510	No
300-33, 300-41, 300-256_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,484	3,890	No
300-33, 300-41, 300-256_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	228	--	--
300-33, 300-41, 300-256_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	94	563	No
300-33, 300-41, 300-256_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	8,781	18,500	No

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
300-33, 300-41, 300-256_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,273	15,700	No
300-33, 300-41, 300-256_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,662	22,000	No
300-33, 300-41, 300-256_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	1,651	2,810	No
300-33, 300-41, 300-256_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.00E+07	3.26E+07	No
300-33, 300-41, 300-256_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,268	10,200	No
300-33, 300-41, 300-256_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	5,495	13,300	No
300-33, 300-41, 300-256_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	314,762	512,000	No
300-33, 300-41, 300-256_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	16	13	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	2.9	--	--
300-33, 300-41, 300-256_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	486	470	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,880	19,100	No
300-33, 300-41, 300-256_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	8,617	52,000	No
300-33, 300-41, 300-256_Shallow	non-Rad	Silver	7440-22-4	µg/kg	782	167	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	7,260	3,210	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	52,694	85,100	No
300-33, 300-41, 300-256_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,462	67,800	No
300-33, 300-41, 300-256_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.1	1.1	Yes
300-33, 300-41, 300-256_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.34	0.11	Yes
300-33, 300-41, 300-256_Shallow	Rad	Uranium-238	U-238	pCi/g	2.1	1.1	Yes
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.51E+06	1.18E+07	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	330	--	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	385	--	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,240	6,470	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	64,600	132,000	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	169	1,510	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,030	3,890	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	100	563	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,080	18,500	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,640	15,700	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,400	22,000	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	1,300	2,810	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.86E+07	3.26E+07	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	3,160	10,200	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Lithium	7439-93-2	µg/kg	6,580	13,300	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	259,000	512,000	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2.2	--	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	275	470	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,040	19,100	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	17,900	52,000	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,460	3,210	Yes
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	51,400	85,100	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	38,900	67,800	No
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	3.0	1.1	Yes
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	2.2	1.1	Yes
300-37_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	100	--	--
300-37_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,200	--	--
300-44_Overburden_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	9,100	6,470	Yes
300-44_Overburden_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,027	3,210	No
300-44_Overburden_Focused	Rad	Uranium-238	U-238	pCi/g	0.35	1.1	No
300-44_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.71E+06	1.18E+07	No
300-44_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	4,100	130	Yes
300-44_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	16,900	6,470	Yes
300-44_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	75,200	132,000	No
300-44_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	480	1,510	No
300-44_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,300	18,500	No
300-44_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,200	15,700	No
300-44_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	7,800	22,000	No
300-44_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.94E+07	3.26E+07	No
300-44_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	303,000	512,000	No
300-44_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,600	19,100	No
300-44_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	872	3,210	No
300-44_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	43,200	85,100	No
300-44_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	37,800	67,800	No
300-44_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.29	1.1	No
300-45_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	86	--	--
300-45_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	290	--	--
300-45_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,600	3,210	Yes
300-45_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.023	1.1	No
300-45_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.061	0.11	No
300-45_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2	1.1	Yes
300-49_Overburden	non-Rad	1,2,4-Trichlorobenzene	120-82-1	µg/kg	31	--	--
300-49_Overburden	non-Rad	1,4-Dichlorobenzene	106-46-7	µg/kg	29	--	--
300-49_Overburden	non-Rad	2,4-Dinitrotoluene	121-14-2	µg/kg	19	--	--
300-49_Overburden	non-Rad	2-Chlorophenol	95-57-8	µg/kg	51	--	--
300-49_Overburden	non-Rad	4-Chloro-3-methylphenol	59-50-7	µg/kg	46	--	--
300-49_Overburden	non-Rad	Acenaphthene	83-32-9	µg/kg	31	--	--
300-49_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.30E+06	1.18E+07	No
300-49_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	232	130	Yes
300-49_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,008	--	--
300-49_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,291	6,470	No
300-49_Overburden	non-Rad	Barium	7440-39-3	µg/kg	76,068	132,000	No
300-49_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	201	1,510	No
300-49_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	174	563	No
300-49_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	18,106	18,500	No
300-49_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,127	15,700	No
300-49_Overburden	non-Rad	Copper	7440-50-8	µg/kg	536,000	22,000	Yes
300-49_Overburden	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	52	--	--
300-49_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.08E+07	3.26E+07	No
300-49_Overburden	non-Rad	Lead	7439-92-1	µg/kg	36,964	10,200	Yes
300-49_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	316,669	512,000	No
300-49_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	13,035	19,100	No
300-49_Overburden	non-Rad	n-Nitrosodi-n-dipropylamine	621-64-7	µg/kg	40	--	--
300-49_Overburden	non-Rad	Pentachlorophenol	87-86-5	µg/kg	50	--	--
300-49_Overburden	non-Rad	Phenol	108-95-2	µg/kg	50	--	--
300-49_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	40	--	--
300-49_Overburden	non-Rad	Silver	7440-22-4	µg/kg	703	167	Yes
300-49_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,066	3,210	No
300-49_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	50,380	85,100	No
300-49_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	141,984	67,800	Yes

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
300-49_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	1.0	1.1	No
300-49_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.057	0.11	No
300-49_Overburden	Rad	Uranium-238	U-238	pCi/g	1.0	1.1	No
300-49_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.92E+06	1.18E+07	No
300-49_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	176	130	Yes
300-49_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,431	6,470	No
300-49_Shallow	non-Rad	Barium	7440-39-3	µg/kg	89,874	132,000	No
300-49_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	303	1,510	No
300-49_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,170	18,500	No
300-49_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,323	15,700	No
300-49_Shallow	non-Rad	Copper	7440-50-8	µg/kg	14,870	22,000	No
300-49_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.59E+07	3.26E+07	No
300-49_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,629	10,200	No
300-49_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	361,805	512,000	No
300-49_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	10,664	19,100	No
300-49_Shallow	non-Rad	Silver	7440-22-4	µg/kg	621	167	Yes
300-49_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,983	3,210	No
300-49_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	58,672	85,100	No
300-49_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	54,651	67,800	No
300-49_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.15	1.1	No
300-49_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	1.1	Yes
300-49_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	0.11	Yes
300-49_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1	1.1	Yes
300-50_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.68E+06	1.18E+07	No
300-50_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	33	--	--
300-50_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	229	--	--
300-50_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	6,897	6,470	Yes
300-50_Overburden	non-Rad	Barium	7440-39-3	µg/kg	117,742	132,000	No
300-50_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	325	1,510	No
300-50_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	563	563	No
300-50_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	12,197	18,500	No
300-50_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	9,389	15,700	No
300-50_Overburden	non-Rad	Copper	7440-50-8	µg/kg	64,527	22,000	Yes
300-50_Overburden	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07	3.26E+07	No
300-50_Overburden	non-Rad	Lead	7439-92-1	µg/kg	5,905	10,200	No
300-50_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	314,271	512,000	No
300-50_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	15,229	19,100	No
300-50_Overburden	non-Rad	Silver	7440-22-4	µg/kg	1,202	167	Yes
300-50_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	17,919	3,210	Yes
300-50_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	45,243	85,100	No
300-50_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	45,889	67,800	No
300-50_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.056	1.1	No
300-50_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	6.0	1.1	Yes
300-50_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.45	0.11	Yes
300-50_Overburden	Rad	Uranium-238	U-238	pCi/g	6.0	1.1	Yes
300-50_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.88E+06	1.18E+07	No
300-50_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	3,000	130	Yes
300-50_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	126	--	--
300-50_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,403	6,470	No
300-50_Shallow	non-Rad	Barium	7440-39-3	µg/kg	103,029	132,000	No
300-50_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	282	1,510	No
300-50_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	19	--	--
300-50_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	463	563	No
300-50_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	16,841	18,500	No
300-50_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,109	15,700	No
300-50_Shallow	non-Rad	Copper	7440-50-8	µg/kg	16,820	22,000	No
300-50_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	3.26E+07	No
300-50_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,381	10,200	No
300-50_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	318,120	512,000	No
300-50_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,413	19,100	No
300-50_Shallow	non-Rad	Silver	7440-22-4	µg/kg	2,992	167	Yes
300-50_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	22,938	3,210	Yes
300-50_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	46,964	85,100	No
300-50_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,344	67,800	No
300-50_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.056	1.1	No
300-50_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	7.9	1.1	Yes
300-50_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.66	0.11	Yes
300-50_Shallow	Rad	Uranium-238	U-238	pCi/g	8.4	1.1	Yes
300-8_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	574	1,510	No
300-8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,374	3,210	No
300-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.79	1.1	No
300-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.82	1.1	No
316-1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	40,572	3,210	Yes
316-1_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.10	1.1	No
316-1_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.32	0.0084	Yes
316-1_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	13	1.1	Yes
316-1_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	1.1	0.11	Yes
316-1_Overburden	Rad	Uranium-238	U-238	pCi/g	13	1.1	Yes
316-1_Shallow_1	non-Rad	Aroclor-1248	12672-29-6	µg/kg	3,000	--	--
316-1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	19,014	6,470	Yes
316-1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	69	--	--
316-1_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	98	--	--
316-1_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	83,027	3,210	Yes
316-1_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.032	1.1	No
316-1_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.2	0.11	Yes
316-1_Shallow_1	Rad	Uranium-238	U-238	pCi/g	28	1.1	Yes
316-1_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	1.11E+07	1.18E+07	No
316-1_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	490	130	Yes
316-1_Shallow_3	non-Rad	Aroclor-1254	11097-69-1	µg/kg	98	--	--
316-1_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	5,138	6,470	No
316-1_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	129,106	132,000	No
316-1_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	416	1,510	No
316-1_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	342	--	--
316-1_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	474	563	No
316-1_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	50,455	18,500	Yes
316-1_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	9,703	15,700	No
316-1_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	1.37E+06	22,000	Yes
316-1_Shallow_3	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	3.2	--	--
316-1_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.44E+07	3.26E+07	No
316-1_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	14,409	10,200	Yes

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
316-1_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	392,825	512,000	No
316-1_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	1,105	13	Yes
316-1_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	94,656	19,100	Yes
316-1_Shallow_3	non-Rad	Phenol	108-95-2	µg/kg	28	--	--
316-1_Shallow_3	non-Rad	Selenium	7782-49-2	µg/kg	1,444	780	Yes
316-1_Shallow_3	non-Rad	Silver	7440-22-4	µg/kg	13,196	167	Yes
316-1_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	63,074	3,210	Yes
316-1_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	56,707	85,100	No
316-1_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	82,016	67,800	Yes
316-1_Shallow_3	Rad	Cesium-137	10045-97-3	pCi/g	0.37	1.1	No
316-1_Shallow_3	Rad	Cobalt-60	10198-40-0	pCi/g	2.3	0.0084	Yes
316-1_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	23	1.1	Yes
316-1_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	2.6	0.11	Yes
316-1_Shallow_3	Rad	Uranium-238	U-238	pCi/g	21	1.1	Yes
316-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	µg/kg	62	--	--
316-1_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	42,963	3,210	Yes
316-1_Shallow_4	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	0.0084	Yes
316-1_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	16	1.1	Yes
316-1_Shallow_4	Rad	Uranium-235	15117-96-1	pCi/g	1.1	0.11	Yes
316-1_Shallow_4	Rad	Uranium-238	U-238	pCi/g	14	1.1	Yes
316-2_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	210,452	3,210	Yes
316-2_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.031	1.1	No
316-2_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.092	0.0084	Yes
316-2_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	86	1.1	Yes
316-2_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	12	0.11	Yes
316-2_Shallow_1	Rad	Uranium-238	U-238	pCi/g	69	1.1	Yes
316-2_Shallow_2	non-Rad	Aroclor-1248	12672-29-6	µg/kg	697	--	--
316-2_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	µg/kg	42	--	--
316-2_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	110	--	--
316-2_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	291,369	3,210	Yes
316-2_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	0.45	1.1	No
316-2_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.45	0.0084	Yes
316-2_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	115	1.1	Yes
316-2_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	11	0.11	Yes
316-2_Shallow_2	Rad	Uranium-238	U-238	pCi/g	96	1.1	Yes
316-2_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	8,000	6,470	Yes
316-2_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	260	--	--
316-2_Shallow_3	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	180	--	--
316-2_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	73,174	3,210	Yes
316-2_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.91	0.11	Yes
316-2_Shallow_3	Rad	Uranium-238	U-238	pCi/g	24	1.1	Yes
316-5_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	3,070	6,470	No
316-5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	38	--	--
316-5_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	146	--	--
316-5_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	100	--	--
316-5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	271,835	3,210	Yes
316-5_Shallow_1	Rad	Americium-241	14596-10-2	pCi/g	0.48	--	--
316-5_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	2.3	1.1	Yes
316-5_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	19	0.11	Yes
316-5_Shallow_1	Rad	Uranium-238	U-238	pCi/g	89	1.1	Yes
316-5_Shallow_2	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	140	--	--
316-5_Shallow_2	non-Rad	2-Butoxyethanol	111-76-2	µg/kg	240	--	--
316-5_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	3,180	6,470	No
316-5_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	76,700	132,000	No
316-5_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	180	--	--
316-5_Shallow_2	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	110	--	--
316-5_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	6,900	18,500	No
316-5_Shallow_2	non-Rad	Chrysene	218-01-9	µg/kg	38	--	--
316-5_Shallow_2	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	146	--	--
316-5_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	3,200	10,200	No
316-5_Shallow_2	non-Rad	Selenium	7782-49-2	µg/kg	490	780	No
316-5_Shallow_2	non-Rad	Silver	7440-22-4	µg/kg	3,600	167	Yes
316-5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	204,701	3,210	Yes
316-5_Shallow_2	Rad	Americium-241	14596-10-2	pCi/g	0.12	--	--
316-5_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	1.7	1.1	Yes
316-5_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	0.0084	Yes
316-5_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	9.0	0.11	Yes
316-5_Shallow_2	Rad	Uranium-238	U-238	pCi/g	68	1.1	Yes
316-5_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	57	--	--
316-5_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	70	--	--
316-5_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--	--
316-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,300	6,470	No
316-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	190	--	--
316-5_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	1,500	--	--
316-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	138,095	3,210	Yes
316-5_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.8	1.1	Yes
316-5_Shallow_Focused	Rad	Europium-155	14391-16-3	pCi/g	0.072	0.054	Yes
316-5_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	7.7	0.11	Yes
316-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	45	1.1	Yes
331 LSLDF_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	25	--	--
331 LSLDF_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	590	--	--
331 LSLDF_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	0.56	--	--
331 LSLDF_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	µg/kg	0.39	--	--
331 LSLDF_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.90E+06	1.18E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	360	130	Yes
331 LSLDF_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	850	--	--
331 LSLDF_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,400	6,470	No
331 LSLDF_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	78,600	132,000	No
331 LSLDF_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	570	1,510	No
331 LSLDF_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	910	--	--
331 LSLDF_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,700	3,890	No
331 LSLDF_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	340	--	--
331 LSLDF_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	140	563	No
331 LSLDF_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,300	18,500	No
331 LSLDF_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	15,700	No
331 LSLDF_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,400	22,000	No
331 LSLDF_Shallow_Focused	non-Rad	Dieldrin	60-57-1	µg/kg	13	--	--
331 LSLDF_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	98	--	--
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan I	959-98-8	µg/kg	1.9	--	--
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	µg/kg	3.1	--	--

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
331 LSLDF_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.20E+07	3.26E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	9,000	10,200	No
331 LSLDF_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	349,000	512,000	No
331 LSLDF_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	110	13	Yes
331 LSLDF_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	µg/kg	3.3	--	--
331 LSLDF_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	11	--	--
331 LSLDF_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	590	470	Yes
331 LSLDF_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000	19,100	No
331 LSLDF_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	41,700	52,000	No
331 LSLDF_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	9,500	--	--
331 LSLDF_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,100	167	Yes
331 LSLDF_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	2,300	3,210	No
331 LSLDF_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	53,100	85,100	No
331 LSLDF_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	137,000	67,800	Yes
331 LSLDF_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	1.1	No
331 LSLDF_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.47	1.1	No
600-243_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	µg/kg	279	--	--
600-243_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	31	--	--
600-243_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	1,300	130	Yes
600-243_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	27	--	--
600-243_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	18	--	--
600-243_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,159	6,470	No
600-243_Shallow	non-Rad	Barium	7440-39-3	µg/kg	292,072	132,000	Yes
600-243_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	43	--	--
600-243_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	43	--	--
600-243_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	46	--	--
600-243_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	32	--	--
600-243_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	2,079	1,510	Yes
600-243_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	432	--	--
600-243_Shallow	non-Rad	Boron	7440-42-8	µg/kg	294,463	3,890	Yes
600-243_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	793	563	Yes
600-243_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	18,006	18,500	No
600-243_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	63	--	--
600-243_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,207	15,700	No
600-243_Shallow	non-Rad	Copper	7440-50-8	µg/kg	53,981	22,000	Yes
600-243_Shallow	non-Rad	Dibenzofuran	132-64-9	µg/kg	78	--	--
600-243_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	37	--	--
600-243_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	79	--	--
600-243_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	28	--	--
600-243_Shallow	non-Rad	Lead	7439-92-1	µg/kg	40,139	10,200	Yes
600-243_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	208,289	512,000	No
600-243_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	1,869	470	Yes
600-243_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	204	--	--
600-243_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	21,395	19,100	Yes
600-243_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	70	--	--
600-243_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	5,709	780	Yes
600-243_Shallow	non-Rad	Silver	7440-22-4	µg/kg	500	167	Yes
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	95,319	--	--
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	334,524	--	--
600-243_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	46,986	85,100	No
600-243_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	84,099	67,800	Yes
600-259_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.034	1.1	No
600-259_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.068	1.1	No
600-259_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.038	1.1	No
600-47_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,300	6,470	No
600-47_Shallow	non-Rad	Barium	7440-39-3	µg/kg	67,000	132,000	No
600-47_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	500	1,510	No
600-47_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	90	563	No
600-47_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	5,500	18,500	No
600-47_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,500	10,200	No
600-47_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,303	3,210	Yes
600-47_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	1.1	Yes
600-47_Shallow	Rad	Uranium-238	U-238	pCi/g	1.6	1.1	Yes
618-1_Deep	non-Rad	Aluminum	7429-90-5	µg/kg	6.37E+06	1.18E+07	No
618-1_Deep	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,760	--	--
618-1_Deep	non-Rad	Aroclor-1260	11096-82-5	µg/kg	294	--	--
618-1_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,550	6,470	No
618-1_Deep	non-Rad	Barium	7440-39-3	µg/kg	299,000	132,000	Yes
618-1_Deep	non-Rad	Beryllium	7440-41-7	µg/kg	218	1,510	No
618-1_Deep	non-Rad	Boron	7440-42-8	µg/kg	1,360	3,890	No
618-1_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	263	563	No
618-1_Deep	non-Rad	Chromium	7440-47-3	µg/kg	7,740	18,500	No
618-1_Deep	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	15,700	No
618-1_Deep	non-Rad	Copper	7440-50-8	µg/kg	46,300	22,000	Yes
618-1_Deep	non-Rad	Fluoride	16984-48-8	µg/kg	2,800	2,810	No
618-1_Deep	non-Rad	Iron	7439-89-6	µg/kg	2.47E+07	3.26E+07	No
618-1_Deep	non-Rad	Lead	7439-92-1	µg/kg	58,400	10,200	Yes
618-1_Deep	non-Rad	Lithium	7439-93-2	µg/kg	5,980	13,300	No
618-1_Deep	non-Rad	Manganese	7439-96-5	µg/kg	352,000	512,000	No
618-1_Deep	non-Rad	Mercury	7439-97-6	µg/kg	1,180	13	Yes
618-1_Deep	non-Rad	Molybdenum	7439-98-7	µg/kg	493	470	Yes
618-1_Deep	non-Rad	Nickel	7440-02-0	µg/kg	17,600	19,100	No
618-1_Deep	non-Rad	Nitrate	14797-55-8	µg/kg	1,700	52,000	No
618-1_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	220	--	--
618-1_Deep	non-Rad	Uranium	7440-61-1	µg/kg	37,400	3,210	Yes
618-1_Deep	non-Rad	Vanadium	7440-62-2	µg/kg	73,000	85,100	No
618-1_Deep	non-Rad	Zinc	7440-66-6	µg/kg	134,000	67,800	Yes
618-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.46	1.1	No
618-1_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	33	1.1	Yes
618-1_Deep	Rad	Uranium-235	15117-96-1	pCi/g	2.7	0.11	Yes
618-1_Deep	Rad	Uranium-238	U-238	pCi/g	32	1.1	Yes
618-1_Deep_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.57E+06	1.18E+07	No
618-1_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	407	130	Yes
618-1_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1.24E+06	--	--
618-1_Deep_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	99	--	--
618-1_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,580	6,470	No
618-1_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	1.87E+06	132,000	Yes
618-1_Deep_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	323	1,510	No
618-1_Deep_Focused	non-Rad	Boron	7440-42-8	µg/kg	6,620	3,890	Yes
618-1_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,030	563	Yes

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
618-1_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	18,900	18,500	Yes
618-1_Deep_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,920	15,700	No
618-1_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	68,700	22,000	Yes
618-1_Deep_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	3,300	2,810	Yes
618-1_Deep_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.41E+07	3.26E+07	No
618-1_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	333,000	10,200	Yes
618-1_Deep_Focused	non-Rad	Lithium	7439-93-2	µg/kg	8,450	13,300	No
618-1_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	351,000	512,000	No
618-1_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	8,940	13	Yes
618-1_Deep_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	2,140	470	Yes
618-1_Deep_Focused	non-Rad	Nickel	7440-02-0	µg/kg	13,700	19,100	No
618-1_Deep_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	11,900	52,000	No
618-1_Deep_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,560	--	--
618-1_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,290	167	Yes
618-1_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	209,000	3,210	Yes
618-1_Deep_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	70,900	85,100	No
618-1_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	82,000	67,800	Yes
618-1_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	6.5	1.1	Yes
618-1_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	70	1.1	Yes
618-1_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.5	0.11	Yes
618-1_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	65	1.1	Yes
618-1_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.21E+06	1.18E+07	No
618-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	264	--	--
618-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	54	--	--
618-1_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,280	6,470	No
618-1_Shallow	non-Rad	Barium	7440-39-3	µg/kg	97,200	132,000	No
618-1_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	188	1,510	No
618-1_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,190	3,890	No
618-1_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	68	563	No
618-1_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,930	18,500	No
618-1_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,360	15,700	No
618-1_Shallow	non-Rad	Copper	7440-50-8	µg/kg	11,400	22,000	No
618-1_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	400	2,810	No
618-1_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07	3.26E+07	No
618-1_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,100	10,200	No
618-1_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	6,380	13,300	No
618-1_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	300,000	512,000	No
618-1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	31	13	Yes
618-1_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	336	470	No
618-1_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,150	19,100	No
618-1_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	1,600	52,000	No
618-1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	300	--	--
618-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,224	3,210	Yes
618-1_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	56,300	85,100	No
618-1_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	42,100	67,800	No
618-1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	1.1	Yes
618-1_Shallow	Rad	Uranium-238	U-238	pCi/g	1.5	1.1	Yes
618-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	1.22E+07	1.18E+07	Yes
618-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	455	130	Yes
618-1_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	35	--	--
618-1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	981	--	--
618-1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	56	--	--
618-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	6,090	6,470	No
618-1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	102,000	132,000	No
618-1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	371	1,510	No
618-1_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	3,740	3,890	No
618-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	266	563	No
618-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	19,500	18,500	Yes
618-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	15,700	No
618-1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	23,800	22,000	Yes
618-1_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	900	2,810	No
618-1_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.28E+07	3.26E+07	No
618-1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,210	10,200	No
618-1_Shallow_Focused	non-Rad	Lithium	7439-93-2	µg/kg	13,300	13,300	No
618-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	403,000	512,000	No
618-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	198	13	Yes
618-1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	356	470	No
618-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	16,800	19,100	No
618-1_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	3,800	52,000	No
618-1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	260	--	--
618-1_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,120	167	Yes
618-1_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	7,080	3,210	Yes
618-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	64,700	85,100	No
618-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	68,100	67,800	Yes
618-1_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	1.1	Yes
618-1_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.99	0.11	Yes
618-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	8.2	1.1	Yes
618-12_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	8,557	6,470	Yes
618-12_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	63	--	--
618-12_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	60	--	--
618-12_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	32,092	3,210	Yes
618-12_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.47	0.11	Yes
618-12_Shallow	Rad	Uranium-238	U-238	pCi/g	11	1.1	Yes
618-13_Shallow	non-Rad	Acetone	67-64-1	µg/kg	8.6	--	--
618-13_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.34E+06	1.18E+07	No
618-13_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	312	130	Yes
618-13_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,500	6,470	No
618-13_Shallow	non-Rad	Barium	7440-39-3	µg/kg	74,000	132,000	No
618-13_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	212	1,510	No
618-13_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,050	3,890	No
618-13_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	63	563	No
618-13_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,700	18,500	No
618-13_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,290	15,700	No
618-13_Shallow	non-Rad	Copper	7440-50-8	µg/kg	11,500	22,000	No
618-13_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.01E+07	3.26E+07	No
618-13_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,620	10,200	No
618-13_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	344,000	512,000	No
618-13_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	5.1	--	--
618-13_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	420	470	No
618-13_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,400	19,100	No

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
618-13_Shallow	non-Rad	Tin	7440-31-5	µg/kg	1,050	--	--
618-13_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,750	3,210	No
618-13_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	55,800	85,100	No
618-13_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,400	67,800	No
618-13_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.038	1.1	No
618-13_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	1.1	Yes
618-13_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	1.1	Yes
618-13_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	5.9	--	--
618-13_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.22E+06	1.18E+07	No
618-13_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	233	130	Yes
618-13_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,390	6,470	No
618-13_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	57,700	132,000	No
618-13_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	184	1,510	No
618-13_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	960	3,890	No
618-13_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	47	563	No
618-13_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,740	18,500	No
618-13_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,710	15,700	No
618-13_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,100	22,000	No
618-13_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	150	--	--
618-13_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.79E+07	3.26E+07	No
618-13_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	4,940	10,200	No
618-13_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	268,000	512,000	No
618-13_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	5.0	--	--
618-13_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	297	470	No
618-13_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000	19,100	No
618-13_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	745	--	--
618-13_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	1,500	3,210	No
618-13_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	48,600	85,100	No
618-13_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	37,100	67,800	No
618-13_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	1.1	Yes
618-13_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.96	1.1	No
618-2_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	1,500	6,470	No
618-2_Deep	non-Rad	Barium	7440-39-3	µg/kg	83,300	132,000	No
618-2_Deep	non-Rad	Chromium	7440-47-3	µg/kg	6,700	18,500	No
618-2_Deep	non-Rad	Lead	7439-92-1	µg/kg	6,600	10,200	No
618-2_Deep	non-Rad	Selenium	7782-49-2	µg/kg	780	780	No
618-2_Deep	non-Rad	Tin	7440-31-5	µg/kg	2,900	--	--
618-2_Deep	non-Rad	Uranium	7440-61-1	µg/kg	501,000	3,210	Yes
618-2_Deep	Rad	Americium-241	14596-10-2	pCi/g	7.9	--	--
618-2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	1.0	1.1	No
618-2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	1.5	0.0038	Yes
618-2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	91	0.025	Yes
618-2_Deep	Rad	Plutonium-241	14119-32-5	pCi/g	42	--	--
618-2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	12	0.18	Yes
618-2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	161	1.1	Yes
618-2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.78	0.11	Yes
618-2_Deep	Rad	Uranium-238	U-238	pCi/g	165	1.1	Yes
618-2_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	6.9	--	--
618-2_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,300	6,470	No
618-2_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	109,000	132,000	No
618-2_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	27	--	--
618-2_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	200	563	No
618-2_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,400	18,500	No
618-2_Deep_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	18	--	--
618-2_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,800	10,200	No
618-2_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	1,200	780	Yes
618-2_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	600	167	Yes
618-2_Deep_Focused	non-Rad	Tin	7440-31-5	µg/kg	42,500	--	--
618-2_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	148,000	3,210	Yes
618-2_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	9.2	--	--
618-2_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.1	1.1	Yes
618-2_Deep_Focused	Rad	Plutonium-238	13981-16-3	pCi/g	1.6	0.0038	Yes
618-2_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	92	0.025	Yes
618-2_Deep_Focused	Rad	Plutonium-241	14119-32-5	pCi/g	33	--	--
618-2_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	7.2	0.18	Yes
618-2_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	48	1.1	Yes
618-2_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	2.4	0.11	Yes
618-2_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	50	1.1	Yes
618-2_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	6,470	No
618-2_Overburden	non-Rad	Barium	7440-39-3	µg/kg	74,700	132,000	No
618-2_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	6,600	18,500	No
618-2_Overburden	non-Rad	Lead	7439-92-1	µg/kg	4,300	10,200	No
618-2_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	1,000	780	Yes
618-2_Overburden	non-Rad	Tin	7440-31-5	µg/kg	2,700	--	--
618-2_Overburden	non-Rad	Uranium	7440-61-1	µg/kg	1,140	3,210	No
618-2_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.058	1.1	No
618-2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.64	1.1	No
618-2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.59	1.1	No
618-2_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	1,900	6,470	No
618-2_Shallow	non-Rad	Barium	7440-39-3	µg/kg	79,100	132,000	No
618-2_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,100	18,500	No
618-2_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,600	10,200	No
618-2_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	760	780	No
618-2_Shallow	non-Rad	Tin	7440-31-5	µg/kg	2,400	--	--
618-2_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	4,530	3,210	Yes
618-2_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.81	--	--
618-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.2	1.1	Yes
618-2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	7.7	0.025	Yes
618-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.2	1.1	Yes
618-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.21	0.11	Yes
618-2_Shallow	Rad	Uranium-238	U-238	pCi/g	2.2	1.1	Yes
618-2_Staging Pile	non-Rad	Arsenic	7440-38-2	µg/kg	3,063	6,470	No
618-2_Staging Pile	non-Rad	Barium	7440-39-3	µg/kg	67,690	132,000	No
618-2_Staging Pile	non-Rad	Chromium	7440-47-3	µg/kg	6,424	18,500	No
618-2_Staging Pile	non-Rad	Lead	7439-92-1	µg/kg	4,011	10,200	No
618-2_Staging Pile	non-Rad	Uranium	7440-61-1	µg/kg	5,022	3,210	Yes
618-2_Staging Pile	Rad	Americium-241	14596-10-2	pCi/g	0.82	--	--
618-2_Staging Pile	Rad	Cesium-137	10045-97-3	pCi/g	0.095	1.1	No
618-2_Staging Pile	Rad	Plutonium-239/240	PU-239/240	pCi/g	10	0.025	Yes
618-2_Staging Pile	Rad	Tritium	10028-17-8	pCi/g	2.3	--	--

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
618-2_Staging Pile	Rad	Uranium-233/234	U-233/234	pCi/g	2.0	1.1	Yes
618-2_Staging Pile	Rad	Uranium-235	15117-96-1	pCi/g	0.12	0.11	Yes
618-2_Staging Pile	Rad	Uranium-238	U-238	pCi/g	2.0	1.1	Yes
618-3_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,800	6,470	No
618-3_Shallow	non-Rad	Barium	7440-39-3	µg/kg	76,500	132,000	No
618-3_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,700	18,500	No
618-3_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,900	10,200	No
618-3_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	659	780	No
618-3_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,610	3,210	No
618-3_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.68	1.1	No
618-3_Shallow	Rad	Uranium-238	U-238	pCi/g	0.75	1.1	No
618-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	238,577	3,210	Yes
618-3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	80	1.1	Yes
618-3_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.8	0.11	Yes
618-3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	79	1.1	Yes
618-4_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,200	6,470	No
618-4_Deep	non-Rad	Lead	7439-92-1	µg/kg	20,000	10,200	Yes
618-4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	64,506	3,210	Yes
618-4_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	20	1.1	Yes
618-4_Deep	Rad	Uranium-235	15117-96-1	pCi/g	1.1	0.11	Yes
618-4_Deep	Rad	Uranium-238	U-238	pCi/g	22	1.1	Yes
618-4_Deep_Focused	non-Rad	2-Butanone	78-93-3	µg/kg	130	--	--
618-4_Deep_Focused	non-Rad	Acetone	67-64-1	µg/kg	16	--	--
618-4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,600	--	--
618-4_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	6,470	No
618-4_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	104,000	132,000	No
618-4_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	4,700	--	--
618-4_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,500	563	Yes
618-4_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	27,700	18,500	Yes
618-4_Deep_Focused	non-Rad	Diethyl ether	60-29-7	µg/kg	1.0	--	--
618-4_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	24,900	10,200	Yes
618-4_Deep_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	40	--	--
618-4_Deep_Focused	non-Rad	Phenol	108-95-2	µg/kg	110	--	--
618-4_Deep_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	24	--	--
618-4_Deep_Focused	non-Rad	Toluene	108-88-3	µg/kg	4.8	--	--
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	34,000	--	--
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - kerosene range	TPHKEROSENE	µg/kg	42,000	--	--
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	65	--	--
618-4_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	20,777	3,210	Yes
618-4_Deep_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	--	--
618-4_Deep_Focused	non-Rad	Trichloromonofluoromethane	75-69-4	µg/kg	12	--	--
618-4_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	7.2	1.1	Yes
618-4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.51	0.11	Yes
618-4_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	6.9	1.1	Yes
618-4_Overburden_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,500	6,470	No
618-4_Overburden_2	non-Rad	Lead	7439-92-1	µg/kg	4,700	10,200	No
618-4_Overburden_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,197	3,210	Yes
618-4_Overburden_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	1.1	Yes
618-4_Overburden_2	Rad	Uranium-238	U-238	pCi/g	1.4	1.1	Yes
618-4_Overburden_3	non-Rad	Lead	7439-92-1	µg/kg	5,000	10,200	No
618-4_Overburden_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,171	3,210	No
618-4_Overburden_3	Rad	Uranium-233/234	U-233/234	pCi/g	0.42	1.1	No
618-4_Overburden_3	Rad	Uranium-235	15117-96-1	pCi/g	0.032	0.11	No
618-4_Overburden_3	Rad	Uranium-238	U-238	pCi/g	0.44	1.1	No
618-4_Overburden_4	non-Rad	Lead	7439-92-1	µg/kg	4,800	10,200	No
618-4_Overburden_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,323	3,210	No
618-4_Overburden_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.94	1.1	No
618-4_Overburden_4	Rad	Uranium-238	U-238	pCi/g	0.94	1.1	No
618-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,200	6,470	No
618-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	49,000	10,200	Yes
618-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	7,456	3,210	Yes
618-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	3.2	1.1	Yes
618-4_Shallow	Rad	Uranium-238	U-238	pCi/g	3.1	1.1	Yes
618-5_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	5,200	6,470	No
618-5_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	470	563	No
618-5_Deep	non-Rad	Chromium	7440-47-3	µg/kg	14,700	18,500	No
618-5_Deep	non-Rad	Lead	7439-92-1	µg/kg	82,300	10,200	Yes
618-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	26,618	3,210	Yes
618-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	8.6	1.1	Yes
618-5_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.46	0.11	Yes
618-5_Deep	Rad	Uranium-238	U-238	pCi/g	8.9	1.1	Yes
618-5_Deep_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.65E+06	1.18E+07	No
618-5_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	1,800	130	Yes
618-5_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,500	6,470	No
618-5_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	106,000	132,000	No
618-5_Deep_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	672	1,510	No
618-5_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,500	18,500	No
618-5_Deep_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	10,500	15,700	No
618-5_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	21,400	22,000	No
618-5_Deep_Focused	non-Rad	Iron	7439-89-6	µg/kg	3.02E+07	3.26E+07	No
618-5_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,600	10,200	No
618-5_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	579,000	512,000	Yes
618-5_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	33	13	Yes
618-5_Deep_Focused	non-Rad	Nickel	7440-02-0	µg/kg	11,300	19,100	No
618-5_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	2,270	780	Yes
618-5_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	36,540	3,210	Yes
618-5_Deep_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	79,500	85,100	No
618-5_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	65,800	67,800	No
618-5_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	1.1	Yes
618-5_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.48	0.11	Yes
618-5_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	12	1.1	Yes
618-5_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,400	6,470	No
618-5_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	170	563	No
618-5_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	9,700	18,500	No
618-5_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,500	10,200	No
618-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	9,773	3,210	Yes
618-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	4.1	1.1	Yes
618-5_Overburden	Rad	Uranium-238	U-238	pCi/g	4.6	1.1	Yes
618-5_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,300	6,470	No
618-5_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,300	18,500	No

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
618-5_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,100	10,200	No
618-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,849	3,210	No
618-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.94	1.1	No
618-5_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1	1.1	No
618-5_Staging Pile_4	non-Rad	Arsenic	7440-38-2	µg/kg	3,300	6,470	No
618-5_Staging Pile_4	non-Rad	Cadmium	7440-43-9	µg/kg	50	563	No
618-5_Staging Pile_4	non-Rad	Chromium	7440-47-3	µg/kg	11,800	18,500	No
618-5_Staging Pile_4	non-Rad	Lead	7439-92-1	µg/kg	5,300	10,200	No
618-5_Staging Pile_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,364	3,210	Yes
618-5_Staging Pile_4	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	1.1	Yes
618-5_Staging Pile_4	Rad	Uranium-238	U-238	pCi/g	1.1	1.1	Yes
618-5_Staging Pile_5	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	6,470	No
618-5_Staging Pile_5	non-Rad	Chromium	7440-47-3	µg/kg	10,300	18,500	No
618-5_Staging Pile_5	non-Rad	Lead	7439-92-1	µg/kg	3,900	10,200	No
618-5_Staging Pile_5	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,326	3,210	Yes
618-5_Staging Pile_5	Rad	Uranium-233/234	U-233/234	pCi/g	1.5	1.1	Yes
618-5_Staging Pile_5	Rad	Uranium-235	15117-96-1	pCi/g	0.17	0.11	Yes
618-5_Staging Pile_5	Rad	Uranium-238	U-238	pCi/g	1.7	1.1	Yes
618-7_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	5.25E+06	1.18E+07	No
618-7_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	560	130	Yes
618-7_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	1,891	6,470	No
618-7_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	68,874	132,000	No
618-7_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	278	1,510	No
618-7_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	65	563	No
618-7_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	10,227	18,500	No
618-7_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	9,152	15,700	No
618-7_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	16,120	22,000	No
618-7_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	2.60E+07	3.26E+07	No
618-7_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	14,567	10,200	Yes
618-7_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	326,067	512,000	No
618-7_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	44	13	Yes
618-7_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	20,977	19,100	Yes
618-7_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,547	--	--
618-7_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	10,814	3,210	Yes
618-7_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	74,576	85,100	No
618-7_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	49,177	67,800	No
618-7_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.067	1.1	No
618-7_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	3.6	1.1	Yes
618-7_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	0.36	0.11	Yes
618-7_Shallow_1	Rad	Uranium-238	U-238	pCi/g	3.6	1.1	Yes
618-7_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	4.97E+06	1.18E+07	No
618-7_Shallow_2	non-Rad	Antimony	7440-36-0	µg/kg	660	130	Yes
618-7_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,500	6,470	No
618-7_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	73,800	132,000	No
618-7_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	440	1,510	No
618-7_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	6,800	18,500	No
618-7_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	9,300	15,700	No
618-7_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	13,600	22,000	No
618-7_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	2.60E+07	3.26E+07	No
618-7_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	2,800	10,200	No
618-7_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	364,000	512,000	No
618-7_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	20	13	Yes
618-7_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	9,700	19,100	No
618-7_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,500	--	--
618-7_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,574	3,210	No
618-7_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	74,700	85,100	No
618-7_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	46,200	67,800	No
618-7_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.57	1.1	No
618-7_Shallow_2	Rad	Uranium-238	U-238	pCi/g	0.53	1.1	No
618-7_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	6.74E+06	1.18E+07	No
618-7_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	450	130	Yes
618-7_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	2,800	6,470	No
618-7_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	82,500	132,000	No
618-7_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	310	1,510	No
618-7_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	190	563	No
618-7_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	10,100	18,500	No
618-7_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	15,700	No
618-7_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	13,600	22,000	No
618-7_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.43E+07	3.26E+07	No
618-7_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	4,300	10,200	No
618-7_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	357,000	512,000	No
618-7_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	20	13	Yes
618-7_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	10,100	19,100	No
618-7_Shallow_3	non-Rad	Tin	7440-31-5	µg/kg	1,800	--	--
618-7_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,852	3,210	No
618-7_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	68,200	85,100	No
618-7_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	44,500	67,800	No
618-7_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	1.1	No
618-7_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.085	0.11	No
618-7_Shallow_3	Rad	Uranium-238	U-238	pCi/g	0.95	1.1	No
618-7_Shallow_4	non-Rad	Aluminum	7429-90-5	µg/kg	5.65E+06	1.18E+07	No
618-7_Shallow_4	non-Rad	Antimony	7440-36-0	µg/kg	250	130	Yes
618-7_Shallow_4	non-Rad	Arsenic	7440-38-2	µg/kg	5,200	6,470	No
618-7_Shallow_4	non-Rad	Barium	7440-39-3	µg/kg	57,900	132,000	No
618-7_Shallow_4	non-Rad	Beryllium	7440-41-7	µg/kg	220	1,510	No
618-7_Shallow_4	non-Rad	Cadmium	7440-43-9	µg/kg	90	563	No
618-7_Shallow_4	non-Rad	Chromium	7440-47-3	µg/kg	11,400	18,500	No
618-7_Shallow_4	non-Rad	Cobalt	7440-48-4	µg/kg	6,700	15,700	No
618-7_Shallow_4	non-Rad	Copper	7440-50-8	µg/kg	13,200	22,000	No
618-7_Shallow_4	non-Rad	Iron	7439-89-6	µg/kg	2.12E+07	3.26E+07	No
618-7_Shallow_4	non-Rad	Lead	7439-92-1	µg/kg	3,000	10,200	No
618-7_Shallow_4	non-Rad	Manganese	7439-96-5	µg/kg	285,000	512,000	No
618-7_Shallow_4	non-Rad	Nickel	7440-02-0	µg/kg	12,900	19,100	No
618-7_Shallow_4	non-Rad	Tin	7440-31-5	µg/kg	710	--	--
618-7_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,064	3,210	No
618-7_Shallow_4	non-Rad	Vanadium	7440-62-2	µg/kg	54,800	85,100	No
618-7_Shallow_4	non-Rad	Zinc	7440-66-6	µg/kg	37,000	67,800	No
618-7_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.69	1.1	No
618-7_Shallow_4	Rad	Uranium-238	U-238	pCi/g	0.76	1.1	No
618-7_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	150	--	--

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
618-7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.61E+06	1.18E+07	No
618-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	980	130	Yes
618-7_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	6.7	--	--
618-7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,200	6,470	No
618-7_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	92,800	132,000	No
618-7_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	88	--	--
618-7_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	66	--	--
618-7_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	52	--	--
618-7_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	11	--	--
618-7_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	370	1,510	No
618-7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	470	--	--
618-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	6,200	563	Yes
618-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	65,900	18,500	Yes
618-7_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	69	--	--
618-7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,000	15,700	No
618-7_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	25,000	22,000	Yes
618-7_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	45	--	--
618-7_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	33	--	--
618-7_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	48	--	--
618-7_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.87E+07	3.26E+07	No
618-7_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,500	10,200	No
618-7_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	425,000	512,000	No
618-7_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	20	13	Yes
618-7_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	17,200	19,100	No
618-7_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	410	--	--
618-7_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,200	--	--
618-7_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	680,000	--	--
618-7_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	19,563	3,210	Yes
618-7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	80,500	85,100	No
618-7_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	52,400	67,800	No
618-7_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.010	1.1	No
618-7_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	1.1	Yes
618-7_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.97	0.11	Yes
618-7_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	6.4	1.1	Yes
618-8_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,100	6,470	No
618-8_Shallow	non-Rad	Barium	7440-39-3	µg/kg	97,600	132,000	No
618-8_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	12,400	18,500	No
618-8_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,100	10,200	No
618-8_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	846	780	Yes
618-8_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,720	3,210	No
618-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	1.1	Yes
618-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.73	1.1	No
618-9_Shallow_Focused	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	110	--	--
618-9_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	680	--	--
618-9_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	390	--	--
618-9_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.57E+06	1.18E+07	No
618-9_Shallow_Focused	non-Rad	Aroclor-1016	12674-11-2	µg/kg	1,900	--	--
618-9_Shallow_Focused	non-Rad	Aroclor-1221	11104-28-2	µg/kg	1,900	--	--
618-9_Shallow_Focused	non-Rad	Aroclor-1232	11141-16-5	µg/kg	1,900	--	--
618-9_Shallow_Focused	non-Rad	Aroclor-1242	53469-21-9	µg/kg	1,900	--	--
618-9_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,900	--	--
618-9_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,900	--	--
618-9_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,900	--	--
618-9_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	11,600	6,470	Yes
618-9_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	90,200	132,000	No
618-9_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	330	1,510	No
618-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	5,200	--	--
618-9_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	2,700	--	--
618-9_Shallow_Focused	non-Rad	Chlordane	57-74-9	µg/kg	69	--	--
618-9_Shallow_Focused	non-Rad	Chloroform	67-66-3	µg/kg	9.0	--	--
618-9_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,700	18,500	No
618-9_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,400	15,700	No
618-9_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	16,700	22,000	No
618-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	7,200	--	--
618-9_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	44	--	--
618-9_Shallow_Focused	non-Rad	Hexachlorobutadiene	87-68-3	µg/kg	760	--	--
618-9_Shallow_Focused	non-Rad	Hexachloroethane	67-72-1	µg/kg	17,000	--	--
618-9_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.49E+07	3.26E+07	No
618-9_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	7,700	10,200	No
618-9_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	359,000	512,000	No
618-9_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	330	13	Yes
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	--	--
618-9_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,600	19,100	No
618-9_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	1.67E+06	52,000	Yes
618-9_Shallow_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	920	--	--
618-9_Shallow_Focused	non-Rad	Toluene	108-88-3	µg/kg	9.0	--	--
618-9_Shallow_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	--	--
618-9_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	3,100	3,210	No
618-9_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	59,300	85,100	No
618-9_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	52,300	67,800	No
618-9_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.071	0.11	No
618-9_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	3.0	1.1	Yes
628-4_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,374	6,470	No
628-4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	61	--	--
628-4_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,284	10,200	No
628-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,308	3,210	No
628-4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.033	1.1	No
628-4_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.87	1.1	No
628-4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.78	1.1	No
628-4_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	42	--	--
628-4_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,115	--	--
628-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	243	--	--
628-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	38	--	--
628-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,864	6,470	No
628-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	99,167	10,200	Yes
628-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,163	3,210	No
628-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	1.1	Yes
628-4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.11	0.11	Yes
628-4_Shallow	Rad	Uranium-238	U-238	pCi/g	1.0	1.1	No
UPR-300-17_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	117	--	--

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
UPR-300-17_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.34E+06	1.18E+07	No
UPR-300-17_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	7.0	--	--
UPR-300-17_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	359	130	Yes
UPR-300-17_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,970	--	--
UPR-300-17_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	450	--	--
UPR-300-17_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	113	--	--
UPR-300-17_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,573	6,470	No
UPR-300-17_Shallow	non-Rad	Barium	7440-39-3	µg/kg	81,014	132,000	No
UPR-300-17_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	59	--	--
UPR-300-17_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	44	--	--
UPR-300-17_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	33	--	--
UPR-300-17_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	9.9	--	--
UPR-300-17_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	240	1,510	No
UPR-300-17_Shallow	non-Rad	Boron	7440-42-8	µg/kg	3,903	3,890	Yes
UPR-300-17_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	173	563	No
UPR-300-17_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	13,795	18,500	No
UPR-300-17_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	39	--	--
UPR-300-17_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,688	15,700	No
UPR-300-17_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,135	22,000	No
UPR-300-17_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	35	--	--
UPR-300-17_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.9	--	--
UPR-300-17_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	5.9	--	--
UPR-300-17_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07	3.26E+07	No
UPR-300-17_Shallow	non-Rad	Lead	7439-92-1	µg/kg	11,240	10,200	Yes
UPR-300-17_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	285,159	512,000	No
UPR-300-17_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	69	13	Yes
UPR-300-17_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	412	470	No
UPR-300-17_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	48	--	--
UPR-300-17_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	563,654	19,100	Yes
UPR-300-17_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	34	--	--
UPR-300-17_Shallow	non-Rad	Silver	7440-22-4	µg/kg	340	167	Yes
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,950	--	--
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	210,420	--	--
UPR-300-17_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,420	3,210	Yes
UPR-300-17_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	52,150	85,100	No
UPR-300-17_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	157,172	67,800	Yes
UPR-300-17_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	6.1	1.1	Yes
UPR-300-17_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.91	0.11	Yes
UPR-300-17_Shallow	Rad	Uranium-238	U-238	pCi/g	4.0	1.1	Yes
UPR-300-46_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	13	--	--
UPR-300-46_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.80E+06	1.18E+07	No
UPR-300-46_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	381	130	Yes
UPR-300-46_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	879	--	--
UPR-300-46_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	490	--	--
UPR-300-46_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	84	--	--
UPR-300-46_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,846	6,470	No
UPR-300-46_Shallow	non-Rad	Barium	7440-39-3	µg/kg	82,137	132,000	No
UPR-300-46_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	3.9	--	--
UPR-300-46_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.4	--	--
UPR-300-46_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	5.4	--	--
UPR-300-46_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.8	--	--
UPR-300-46_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	222	1,510	No
UPR-300-46_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,714	3,890	No
UPR-300-46_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	95	563	No
UPR-300-46_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,173	18,500	No
UPR-300-46_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	5.6	--	--
UPR-300-46_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,361	15,700	No
UPR-300-46_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,151	22,000	No
UPR-300-46_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	1.3	--	--
UPR-300-46_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	9.6	--	--
UPR-300-46_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.2	--	--
UPR-300-46_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	7.6	--	--
UPR-300-46_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07	3.26E+07	No
UPR-300-46_Shallow	non-Rad	Lead	7439-92-1	µg/kg	7,105	10,200	No
UPR-300-46_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	311,001	512,000	No
UPR-300-46_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	29	13	Yes
UPR-300-46_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	456	470	No
UPR-300-46_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	36	--	--
UPR-300-46_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,230	19,100	No
UPR-300-46_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	4.4	--	--
UPR-300-46_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,897	3,210	Yes
UPR-300-46_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	53,808	85,100	No
UPR-300-46_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	47,945	67,800	No
UPR-300-46_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.070	1.1	No
UPR-300-46_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.8	1.1	Yes
UPR-300-46_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	0.11	Yes
UPR-300-46_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	1.1	Yes

Table A-4. Comparison of EPC from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
300 ASH PITS_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	52	91,112	No
300 ASH PITS_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	96	--[b]	--
300 ASH PITS_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	76	8.41E+06	No
300-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	13,500	37,999	No
300-10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	200	--[b]	--
300-10_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	230	8.41E+06	No
300-10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,078	101,630[c]	No
300-10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
300-109_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	122	--[b]	--
300-109_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	40	--[b]	--
300-109_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.2	--[b]	--
300-109_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	2.3	--[b]	--
300-109_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	1.8	--[b]	--
300-109_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	14	--[b]	--
300-109_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	22	1.41E+06	No
300-109_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	1.6	--[b]	--
300-109_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,108	101,630[c]	No
300-109_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	--[d]	--
300-109_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	37	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	19	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	2.1	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.3	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.3	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	5.1	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	29	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	µg/kg	7.0	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,450	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,877	101,630[c]	No
300-109_Staging Pile Area_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	2.5	--[d]	--
300-109_Staging Pile Area_Focused	Rad	Uranium-238	U-238	pCi/g	2.3	--[d]	--
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	120,000	2.00E+06[e]	No
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	230,000	2.00E+06[e]	No
300-23_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	52,000	2.00E+06[e]	No
300-259_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	322	270,034	No
300-259_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,876	101,630[c]	No
300-259_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	479,584	--[b]	--
300-259_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.6	--[d]	--
300-259_Shallow	Rad	Uranium-238	U-238	pCi/g	1.3	--[d]	--
300-260_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	922	270,034	No
300-260_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	8,360	1.08E+08	No
300-260_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	73,300	2.41E+08	No
300-260_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	18,300	1.06E+07	No
300-260_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	537	2.58E+07	No
300-260_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	206	--[b]	--
300-260_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,800	101,630[c]	No
300-260_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	77,400	--[b]	--
300-260_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.25	--[d]	--
300-260_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	4.3	--[d]	--
300-272_Overburden_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	13,100	2.00E+06[e]	No
300-272_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	43,100	2.00E+06[e]	No
300-275_Shallow_1	non-Rad	Acenaphthene	83-32-9	µg/kg	960	7.38E+07	No
300-275_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	260	270,034	No
300-275_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.3	--[b]	--
300-275_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.9	--[b]	--
300-275_Shallow_1	non-Rad	Chrysene	218-01-9	µg/kg	2.2	--[b]	--
300-275_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	42,923	2.41E+08	No
300-275_Shallow_1	non-Rad	Fluoranthene	206-44-0	µg/kg	2,300	--[b]	--
300-275_Shallow_1	non-Rad	Fluorene	86-73-7	µg/kg	81	6.17E+07	No
300-275_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	17	1.41E+06	No
300-275_Shallow_1	non-Rad	Strontium	7440-24-6	µg/kg	20,196	--[b]	--
300-275_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,483	--[b]	--
300-275_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	7.7	--[d]	--
300-275_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.0	--[d]	--
300-275_Shallow_1	Rad	Uranium-238	U-238	pCi/g	7.4	--[d]	--
300-275_Shallow_2	non-Rad	Acenaphthene	83-32-9	µg/kg	3.6	7.38E+07	No
300-275_Shallow_2	non-Rad	Fluoranthene	206-44-0	µg/kg	56	--[b]	--
300-275_Shallow_2	non-Rad	Fluorene	86-73-7	µg/kg	2.6	6.17E+07	No
300-275_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	28	1.41E+06	No
300-275_Shallow_2	non-Rad	Strontium	7440-24-6	µg/kg	27,081	--[b]	--
300-275_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,149	--[b]	--
300-275_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,725	101,630[c]	No
300-275_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
300-275_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
300-275_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.2	--[d]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1016	12674-11-2	µg/kg	10	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	16	97,738	No
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	190	91,112	No
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	84	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	17	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	228	8.41E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	16	1.41E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	2.9	2,098	No

Table A-4. Comparison of EPC from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
300-33, 300-41, 300-256_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	486	2.58E+07	No
300-33, 300-41, 300-256_Shallow	non-Rad	Silver	7440-22-4	µg/kg	782	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	7,260	101,630[c]	No
300-33, 300-41, 300-256_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.1	--[d]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.34	--[d]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-238	U-238	pCi/g	2.1	--[d]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	330	91,112	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	385	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2.2	2,098	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,460	101,630[c]	No
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	3.0	--[d]	--
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	2.2	--[d]	--
300-37_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	100	--[b]	--
300-37_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,200	--[b]	--
300-44_Overburden_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	9,100	37,999	No
300-44_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	4,100	270,034	No
300-44_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	16,900	37,999	No
300-45_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	86	--[b]	--
300-45_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	290	--[b]	--
300-45_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,600	101,630[c]	No
300-45_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2	--[d]	--
300-49_Overburden	non-Rad	1,2,4-Trichlorobenzene	120-82-1	µg/kg	31	28,655	No
300-49_Overburden	non-Rad	1,4-Dichlorobenzene	106-46-7	µg/kg	29	61,744	No
300-49_Overburden	non-Rad	2,4-Dinitrotoluene	121-14-2	µg/kg	19	402	No
300-49_Overburden	non-Rad	2-Chlorophenol	95-57-8	µg/kg	51	194,372	No
300-49_Overburden	non-Rad	4-Chloro-3-methylphenol	59-50-7	µg/kg	46	9.78E+06	No
300-49_Overburden	non-Rad	Acenaphthene	83-32-9	µg/kg	31	7.38E+07	No
300-49_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	232	270,034	No
300-49_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,008	--[b]	--
300-49_Overburden	non-Rad	Copper	7440-50-8	µg/kg	536,000	2.41E+08	No
300-49_Overburden	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	52	2.85E+07	No
300-49_Overburden	non-Rad	Lead	7439-92-1	µg/kg	36,964	1.06E+07	No
300-49_Overburden	non-Rad	n-Nitrosodi-n-dipropylamine	621-64-7	µg/kg	40	330	No
300-49_Overburden	non-Rad	Pentachlorophenol	87-86-5	µg/kg	50	5,346	No
300-49_Overburden	non-Rad	Phenol	108-95-2	µg/kg	50	1.49E+06	No
300-49_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	40	--[b]	--
300-49_Overburden	non-Rad	Silver	7440-22-4	µg/kg	703	--[b]	--
300-49_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	141,984	--[b]	--
300-49_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	176	270,034	No
300-49_Shallow	non-Rad	Silver	7440-22-4	µg/kg	621	--[b]	--
300-49_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
300-49_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
300-49_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
300-50_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	33	--[b]	--
300-50_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	229	--[b]	--
300-50_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	6,897	37,999	No
300-50_Overburden	non-Rad	Copper	7440-50-8	µg/kg	64,527	2.41E+08	No
300-50_Overburden	non-Rad	Silver	7440-22-4	µg/kg	1,202	--[b]	--
300-50_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	17,919	101,630[c]	No
300-50_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	6.0	--[d]	--
300-50_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.45	--[d]	--
300-50_Overburden	Rad	Uranium-238	U-238	pCi/g	6.0	--[d]	--
300-50_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	3,000	270,034	No
300-50_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	126	--[b]	--
300-50_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	19	--[b]	--
300-50_Shallow	non-Rad	Silver	7440-22-4	µg/kg	2,992	--[b]	--
300-50_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	22,938	101,630[c]	No
300-50_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	7.9	--[d]	--
300-50_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.66	--[d]	--
300-50_Shallow	Rad	Uranium-238	U-238	pCi/g	8.4	--[d]	--
316-1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	40,572	101,630[c]	No
316-1_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.32	--[b]	--
316-1_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	13	--[d]	--
316-1_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
316-1_Overburden	Rad	Uranium-238	U-238	pCi/g	13	--[d]	--
316-1_Shallow_1	non-Rad	Aroclor-1248	12672-29-6	µg/kg	3,000	91,112	No
316-1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	19,014	37,999	No
316-1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	69	--[b]	--
316-1_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	98	8.41E+06	No
316-1_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	83,027	101,630[c]	No
316-1_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.2	--[d]	--
316-1_Shallow_1	Rad	Uranium-238	U-238	pCi/g	28	--[d]	--
316-1_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	490	270,034	No
316-1_Shallow_3	non-Rad	Aroclor-1254	11097-69-1	µg/kg	98	--[b]	--
316-1_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	342	--[b]	--
316-1_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	50,455	--[b]	--
316-1_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	1.37E+06	2.41E+08	No
316-1_Shallow_3	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	3.2	--[b]	--
316-1_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	14,409	1.06E+07	No
316-1_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	1,105	1.41E+06	No
316-1_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	94,656	--[b]	--
316-1_Shallow_3	non-Rad	Phenol	108-95-2	µg/kg	28	1.49E+06	No
316-1_Shallow_3	non-Rad	Selenium	7782-49-2	µg/kg	1,444	3.02E+06	No

Table A-4. Comparison of EPC from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
316-1_Shallow_3	non-Rad	Silver	7440-22-4	µg/kg	13,196	--[b]	--
316-1_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	63,074	101,630[c]	No
316-1_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	82,016	--[b]	--
316-1_Shallow_3	Rad	Cobalt-60	10198-40-0	pCi/g	2.3	--[b]	--
316-1_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	23	--[d]	--
316-1_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	2.6	--[d]	--
316-1_Shallow_3	Rad	Uranium-238	U-238	pCi/g	21	--[d]	--
316-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	µg/kg	62	--[b]	--
316-1_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	42,963	101,630[c]	No
316-1_Shallow_4	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--
316-1_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	16	--[d]	--
316-1_Shallow_4	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
316-1_Shallow_4	Rad	Uranium-238	U-238	pCi/g	14	--[d]	--
316-2_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	210,452	101,630[c]	Yes
316-2_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.092	--[b]	--
316-2_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	86	--[d]	--
316-2_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	12	--[d]	--
316-2_Shallow_1	Rad	Uranium-238	U-238	pCi/g	69	--[d]	--
316-2_Shallow_2	non-Rad	Aroclor-1248	12672-29-6	µg/kg	697	91,112	No
316-2_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	µg/kg	42	--[b]	--
316-2_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	110	--[b]	--
316-2_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	291,369	101,630[c]	Yes
316-2_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.45	--[b]	--
316-2_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	115	--[d]	--
316-2_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	11	--[d]	--
316-2_Shallow_2	Rad	Uranium-238	U-238	pCi/g	96	--[d]	--
316-2_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	8,000	37,999	No
316-2_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	260	--[b]	--
316-2_Shallow_3	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	180	8.41E+06	No
316-2_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	73,174	101,630[c]	No
316-2_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.91	--[d]	--
316-2_Shallow_3	Rad	Uranium-238	U-238	pCi/g	24	--[d]	--
316-5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	38	--[b]	--
316-5_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	146	--[b]	--
316-5_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	100	8.41E+06	No
316-5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	271,835	101,630[c]	Yes
316-5_Shallow_1	Rad	Americium-241	14596-10-2	pCi/g	0.48	--[b]	--
316-5_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	2.3	--[b]	--
316-5_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	19	--[d]	--
316-5_Shallow_1	Rad	Uranium-238	U-238	pCi/g	89	--[d]	--
316-5_Shallow_2	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	140	270	No
316-5_Shallow_2	non-Rad	2-Butoxyethanol	111-76-2	µg/kg	240	251,308	No
316-5_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	180	--[b]	--
316-5_Shallow_2	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	110	8.41E+06	No
316-5_Shallow_2	non-Rad	Chrysene	218-01-9	µg/kg	38	--[b]	--
316-5_Shallow_2	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	146	2.85E+07	No
316-5_Shallow_2	non-Rad	Silver	7440-22-4	µg/kg	3,600	--[b]	--
316-5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	204,701	101,630[c]	Yes
316-5_Shallow_2	Rad	Americium-241	14596-10-2	pCi/g	0.12	--[b]	--
316-5_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	1.7	--[b]	--
316-5_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--
316-5_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	9.0	--[d]	--
316-5_Shallow_2	Rad	Uranium-238	U-238	pCi/g	68	--[d]	--
316-5_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	57	91,112	No
316-5_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	70	--[b]	--
316-5_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--[b]	--
316-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	190	--[b]	--
316-5_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	1,500	2.85E+07	No
316-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	138,095	101,630[c]	Yes
316-5_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.8	--[b]	--
316-5_Shallow_Focused	Rad	Europium-155	14391-16-3	pCi/g	0.072	--[b]	--
316-5_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	7.7	--[d]	--
316-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	45	--[d]	--
331 LSLDF_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	25	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	590	2.23E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	0.56	7,793	No
331 LSLDF_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	µg/kg	0.39	285	No
331 LSLDF_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	360	270,034	No
331 LSLDF_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	850	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	910	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	340	8.41E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Dieldrin	60-57-1	µg/kg	13	2,733	No
331 LSLDF_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	98	2.85E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan I	959-98-8	µg/kg	1.9	2.46E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	µg/kg	3.1	2.46E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	110	1.41E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	µg/kg	3.3	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	11	2,098	No
331 LSLDF_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	590	2.58E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	9,500	3.03E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,100	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	137,000	--[b]	--
600-243_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	µg/kg	279	1.07E+06	No

Table A-4. Comparison of EPC from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
600-243_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	31	--[b]	--
600-243_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	1,300	270,034	No
600-243_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	27	--[b]	--
600-243_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	18	--[b]	--
600-243_Shallow	non-Rad	Barium	7440-39-3	µg/kg	292,072	--[b]	--
600-243_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	43	--[b]	--
600-243_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	43	--[b]	--
600-243_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	46	--[b]	--
600-243_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	32	--[b]	--
600-243_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	2,079	--[b]	--
600-243_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	432	--[b]	--
600-243_Shallow	non-Rad	Boron	7440-42-8	µg/kg	294,463	1.08E+08	No
600-243_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	793	3.52E+06	No
600-243_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	63	--[b]	--
600-243_Shallow	non-Rad	Copper	7440-50-8	µg/kg	53,981	2.41E+08	No
600-243_Shallow	non-Rad	Dibenzofuran	132-64-9	µg/kg	78	2.32E+06	No
600-243_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	37	2.85E+07	No
600-243_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	79	--[b]	--
600-243_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	28	--[b]	--
600-243_Shallow	non-Rad	Lead	7439-92-1	µg/kg	40,139	1.06E+07	No
600-243_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	1,869	2.58E+07	No
600-243_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	204	2.26E+06	No
600-243_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	21,395	--[b]	--
600-243_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	70	--[b]	--
600-243_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	5,709	3.02E+06	No
600-243_Shallow	non-Rad	Silver	7440-22-4	µg/kg	500	--[b]	--
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	95,319	2.00E+06[e]	No
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	334,524	2.00E+06[e]	No
600-243_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	84,099	--[b]	--
600-47_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,303	101,630[c]	No
600-47_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	--[d]	--
600-47_Shallow	Rad	Uranium-238	U-238	pCi/g	1.6	--[d]	--
618-1_Deep	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,760	--[b]	--
618-1_Deep	non-Rad	Aroclor-1260	11096-82-5	µg/kg	294	--[b]	--
618-1_Deep	non-Rad	Barium	7440-39-3	µg/kg	299,000	--[b]	--
618-1_Deep	non-Rad	Copper	7440-50-8	µg/kg	46,300	2.41E+08	No
618-1_Deep	non-Rad	Lead	7439-92-1	µg/kg	58,400	1.06E+07	No
618-1_Deep	non-Rad	Mercury	7439-97-6	µg/kg	1,180	1.41E+06	No
618-1_Deep	non-Rad	Molybdenum	7439-98-7	µg/kg	493	2.58E+07	No
618-1_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	220	3.03E+06	No
618-1_Deep	non-Rad	Uranium	7440-61-1	µg/kg	37,400	101,630[c]	No
618-1_Deep	non-Rad	Zinc	7440-66-6	µg/kg	134,000	--[b]	--
618-1_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	33	--[d]	--
618-1_Deep	Rad	Uranium-235	15117-96-1	pCi/g	2.7	--[d]	--
618-1_Deep	Rad	Uranium-238	U-238	pCi/g	32	--[d]	--
618-1_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	407	270,034	No
618-1_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1.24E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	99	--[b]	--
618-1_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	1.87E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Boron	7440-42-8	µg/kg	6,620	1.08E+08	No
618-1_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,030	3.52E+06	No
618-1_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	18,900	--[b]	--
618-1_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	68,700	2.41E+08	No
618-1_Deep_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	3,300	--[b]	--
618-1_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	333,000	1.06E+07	No
618-1_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	8,940	1.41E+06	No
618-1_Deep_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	2,140	2.58E+07	No
618-1_Deep_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,560	3.03E+06	No
618-1_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,290	--[b]	--
618-1_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	209,000	101,630[c]	Yes
618-1_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	82,000	--[b]	--
618-1_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	6.5	--[b]	--
618-1_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	70	--[d]	--
618-1_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.5	--[d]	--
618-1_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	65	--[d]	--
618-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	264	--[b]	--
618-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	54	--[b]	--
618-1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	31	1.41E+06	No
618-1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	300	3.03E+06	No
618-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,224	101,630[c]	No
618-1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	--[d]	--
618-1_Shallow	Rad	Uranium-238	U-238	pCi/g	1.5	--[d]	--
618-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	1.22E+07	--[b]	--
618-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	455	270,034	No
618-1_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	35	91,112	No
618-1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	981	--[b]	--
618-1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	56	--[b]	--
618-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	19,500	--[b]	--
618-1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	23,800	2.41E+08	No
618-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	198	1.41E+06	No
618-1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	260	3.03E+06	No
618-1_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,120	--[b]	--
618-1_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	7,080	101,630[c]	No
618-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	68,100	--[b]	--

Table A-4. Comparison of EPC from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-1_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-1_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.99	--[d]	--
618-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	8.2	--[d]	--
618-12_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	8,557	37,999	No
618-12_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	63	--[b]	--
618-12_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	60	8.41E+06	No
618-12_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	32,092	101,630[c]	No
618-12_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.47	--[d]	--
618-12_Shallow	Rad	Uranium-238	U-238	pCi/g	11	--[d]	--
618-13_Shallow	non-Rad	Acetone	67-64-1	µg/kg	8.6	2.23E+06	No
618-13_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	312	270,034	No
618-13_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	5.1	2,098	No
618-13_Shallow	non-Rad	Tin	7440-31-5	µg/kg	1,050	--[b]	--
618-13_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	--[d]	--
618-13_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
618-13_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	5.9	2.23E+06	No
618-13_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	233	270,034	No
618-13_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	150	6,000[f]	No
618-13_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	5.0	2,098	No
618-13_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	745	--[b]	--
618-13_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
618-2_Deep	non-Rad	Tin	7440-31-5	µg/kg	2,900	--[b]	--
618-2_Deep	non-Rad	Uranium	7440-61-1	µg/kg	501,000	101,630[c]	Yes
618-2_Deep	Rad	Americium-241	14596-10-2	pCi/g	7.9	--[b]	--
618-2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	1.5	--[b]	--
618-2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	91	--[b]	--
618-2_Deep	Rad	Plutonium-241	14119-32-5	pCi/g	42	--[b]	--
618-2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	12	227,428	No
618-2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	161	--[d]	--
618-2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.78	--[d]	--
618-2_Deep	Rad	Uranium-238	U-238	pCi/g	165	--[d]	--
618-2_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	6.9	--[b]	--
618-2_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	27	--[b]	--
618-2_Deep_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	18	2.85E+07	No
618-2_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	1,200	3.02E+06	No
618-2_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	600	--[b]	--
618-2_Deep_Focused	non-Rad	Tin	7440-31-5	µg/kg	42,500	--[b]	--
618-2_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	148,000	101,630[c]	Yes
618-2_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	9.2	--[b]	--
618-2_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.1	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-238	13981-16-3	pCi/g	1.6	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	92	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-241	14119-32-5	pCi/g	33	--[b]	--
618-2_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	7.2	227,428	No
618-2_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	48	--[d]	--
618-2_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	2.4	--[d]	--
618-2_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	50	--[d]	--
618-2_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	1,000	3.02E+06	No
618-2_Overburden	non-Rad	Tin	7440-31-5	µg/kg	2,700	--[b]	--
618-2_Shallow	non-Rad	Tin	7440-31-5	µg/kg	2,400	--[b]	--
618-2_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	4,530	101,630[c]	No
618-2_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.81	--[b]	--
618-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.2	--[b]	--
618-2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	7.7	--[b]	--
618-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.2	--[d]	--
618-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.21	--[d]	--
618-2_Shallow	Rad	Uranium-238	U-238	pCi/g	2.2	--[d]	--
618-2_Staging Pile	non-Rad	Uranium	7440-61-1	µg/kg	5,022	101,630[c]	No
618-2_Staging Pile	Rad	Americium-241	14596-10-2	pCi/g	0.82	--[b]	--
618-2_Staging Pile	Rad	Plutonium-239/240	PU-239/240	pCi/g	10	--[b]	--
618-2_Staging Pile	Rad	Tritium	10028-17-8	pCi/g	2.3	9,176	No
618-2_Staging Pile	Rad	Uranium-233/234	U-233/234	pCi/g	2.0	--[d]	--
618-2_Staging Pile	Rad	Uranium-235	15117-96-1	pCi/g	0.12	--[d]	--
618-2_Staging Pile	Rad	Uranium-238	U-238	pCi/g	2.0	--[d]	--
618-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	238,577	101,630[c]	Yes
618-3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	80	--[d]	--
618-3_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.8	--[d]	--
618-3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	79	--[d]	--
618-4_Deep	non-Rad	Lead	7439-92-1	µg/kg	20,000	1.06E+07	No
618-4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	64,506	101,630[c]	No
618-4_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	20	--[d]	--
618-4_Deep	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
618-4_Deep	Rad	Uranium-238	U-238	pCi/g	22	--[d]	--
618-4_Deep_Focused	non-Rad	2-Butanone	78-93-3	µg/kg	130	1.67E+06	No
618-4_Deep_Focused	non-Rad	Acetone	67-64-1	µg/kg	16	2.23E+06	No
618-4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,600	--[b]	--
618-4_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	4,700	--[b]	--
618-4_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,500	3.52E+06	No
618-4_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	27,700	--[b]	--
618-4_Deep_Focused	non-Rad	Diethyl ether	60-29-7	µg/kg	1.0	664,052	No
618-4_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	24,900	1.06E+07	No
618-4_Deep_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	40	2,098	No
618-4_Deep_Focused	non-Rad	Phenol	108-95-2	µg/kg	110	1.49E+06	No

Table A-4. Comparison of EPC from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-4_Deep_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	24	275	No
618-4_Deep_Focused	non-Rad	Toluene	108-88-3	µg/kg	4.8	1.15E+06	No
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	34,000	2.00E+06[e]	No
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - kerosene range	TPHKEROSENE	µg/kg	42,000	2.00E+06[e]	No
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	65	2.00E+06[e]	No
618-4_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	20,777	101,630[c]	No
618-4_Deep_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	690	No
618-4_Deep_Focused	non-Rad	Trichloromonofluoromethane	75-69-4	µg/kg	12	1.95E+06	No
618-4_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	7.2	--[d]	--
618-4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.51	--[d]	--
618-4_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	6.9	--[d]	--
618-4_Overburden_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,197	101,630[c]	No
618-4_Overburden_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
618-4_Overburden_2	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
618-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	49,000	1.06E+07	No
618-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	7,456	101,630[c]	No
618-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	3.2	--[d]	--
618-4_Shallow	Rad	Uranium-238	U-238	pCi/g	3.1	--[d]	--
618-5_Deep	non-Rad	Lead	7439-92-1	µg/kg	82,300	1.06E+07	No
618-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	26,618	101,630[c]	No
618-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	8.6	--[d]	--
618-5_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.46	--[d]	--
618-5_Deep	Rad	Uranium-238	U-238	pCi/g	8.9	--[d]	--
618-5_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	1,800	270,034	No
618-5_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	579,000	--[b]	--
618-5_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	33	1.41E+06	No
618-5_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	2,270	3.02E+06	No
618-5_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	36,540	101,630[c]	No
618-5_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-5_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.48	--[d]	--
618-5_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	12	--[d]	--
618-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	9,773	101,630[c]	No
618-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	4.1	--[d]	--
618-5_Overburden	Rad	Uranium-238	U-238	pCi/g	4.6	--[d]	--
618-5_Staging Pile_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,364	101,630[c]	No
618-5_Staging Pile_4	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	--[d]	--
618-5_Staging Pile_4	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
618-5_Staging Pile_5	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,326	101,630[c]	No
618-5_Staging Pile_5	Rad	Uranium-233/234	U-233/234	pCi/g	1.5	--[d]	--
618-5_Staging Pile_5	Rad	Uranium-235	15117-96-1	pCi/g	0.17	--[d]	--
618-5_Staging Pile_5	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
618-7_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	560	270,034	No
618-7_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	14,567	1.06E+07	No
618-7_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	44	1.41E+06	No
618-7_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	20,977	--[b]	--
618-7_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,547	--[b]	--
618-7_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	10,814	101,630[c]	No
618-7_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	3.6	--[d]	--
618-7_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	0.36	--[d]	--
618-7_Shallow_1	Rad	Uranium-238	U-238	pCi/g	3.6	--[d]	--
618-7_Shallow_2	non-Rad	Antimony	7440-36-0	µg/kg	660	270,034	No
618-7_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	20	1.41E+06	No
618-7_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,500	--[b]	--
618-7_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	450	270,034	No
618-7_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	20	1.41E+06	No
618-7_Shallow_3	non-Rad	Tin	7440-31-5	µg/kg	1,800	--[b]	--
618-7_Shallow_4	non-Rad	Antimony	7440-36-0	µg/kg	250	270,034	No
618-7_Shallow_4	non-Rad	Tin	7440-31-5	µg/kg	710	--[b]	--
618-7_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	150	7.38E+07	No
618-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	980	270,034	No
618-7_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	6.7	91,112	No
618-7_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	88	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	66	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	52	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	11	--[b]	--
618-7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	470	--[b]	--
618-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	6,200	3.52E+06	No
618-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	65,900	--[b]	--
618-7_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	69	--[b]	--
618-7_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	25,000	2.41E+08	No
618-7_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	45	--[b]	--
618-7_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	33	2.85E+07	No
618-7_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	48	--[b]	--
618-7_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	20	1.41E+06	No
618-7_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	410	--[b]	--
618-7_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,200	--[b]	--
618-7_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	680,000	2.00E+06[e]	No
618-7_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	19,563	101,630[c]	No
618-7_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-7_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.97	--[d]	--
618-7_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	6.4	--[d]	--
618-8_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	846	3.02E+06	No
618-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	--[d]	--
618-9_Shallow_Focused	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	110	270	No

Table A-4. Comparison of EPC from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-9_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	680	2.23E+06	No
618-9_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	390	7,793	No
618-9_Shallow_Focused	non-Rad	Aroclor-1016	12674-11-2	µg/kg	1,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1221	11104-28-2	µg/kg	1,900	5,773	No
618-9_Shallow_Focused	non-Rad	Aroclor-1232	11141-16-5	µg/kg	1,900	5,773	No
618-9_Shallow_Focused	non-Rad	Aroclor-1242	53469-21-9	µg/kg	1,900	97,738	No
618-9_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,900	91,112	No
618-9_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	11,600	37,999	No
618-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	5,200	--[b]	--
618-9_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	2,700	8.41E+06	No
618-9_Shallow_Focused	non-Rad	Chlordane	57-74-9	µg/kg	69	--[b]	--
618-9_Shallow_Focused	non-Rad	Chloroform	67-66-3	µg/kg	9.0	1,289	No
618-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	7,200	2.85E+07	No
618-9_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	44	--[b]	--
618-9_Shallow_Focused	non-Rad	Hexachlorobutadiene	87-68-3	µg/kg	760	--[b]	--
618-9_Shallow_Focused	non-Rad	Hexachloroethane	67-72-1	µg/kg	17,000	65,103	No
618-9_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	330	1.41E+06	No
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	2,098	Yes
618-9_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	1.67E+06	1.36E+07	No
618-9_Shallow_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	920	275	Yes
618-9_Shallow_Focused	non-Rad	Toluene	108-88-3	µg/kg	9.0	1.15E+06	No
618-9_Shallow_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	690	No
618-9_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	3.0	--[d]	--
628-4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	61	--[b]	--
628-4_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	42	97,738	No
628-4_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,115	91,112	No
628-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	243	--[b]	--
628-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	38	--[b]	--
628-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	99,167	1.06E+07	No
628-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
628-4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.11	--[d]	--
UPR-300-17_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	117	7.38E+07	No
UPR-300-17_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	7.0	--[b]	--
UPR-300-17_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	359	270,034	No
UPR-300-17_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,970	91,112	No
UPR-300-17_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	450	--[b]	--
UPR-300-17_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	113	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	59	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	44	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	33	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	9.9	--[b]	--
UPR-300-17_Shallow	non-Rad	Boron	7440-42-8	µg/kg	3,903	1.08E+08	No
UPR-300-17_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	39	--[b]	--
UPR-300-17_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	35	--[b]	--
UPR-300-17_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.9	6.17E+07	No
UPR-300-17_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	5.9	--[b]	--
UPR-300-17_Shallow	non-Rad	Lead	7439-92-1	µg/kg	11,240	1.06E+07	No
UPR-300-17_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	69	1.41E+06	No
UPR-300-17_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	48	2.26E+06	No
UPR-300-17_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	563,654	--[b]	--
UPR-300-17_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	34	--[b]	--
UPR-300-17_Shallow	non-Rad	Silver	7440-22-4	µg/kg	340	--[b]	--
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,950	2.00E+06[e]	No
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	210,420	2.00E+06[e]	No
UPR-300-17_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,420	101,630[c]	No
UPR-300-17_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	157,172	--[b]	--
UPR-300-17_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	6.1	--[d]	--
UPR-300-17_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.91	--[d]	--
UPR-300-17_Shallow	Rad	Uranium-238	U-238	pCi/g	4.0	--[d]	--
UPR-300-46_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	13	7.38E+07	No
UPR-300-46_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	381	270,034	No
UPR-300-46_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	879	91,112	No
UPR-300-46_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	490	--[b]	--
UPR-300-46_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	84	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	3.9	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	5.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.8	--[b]	--
UPR-300-46_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	5.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	1.3	--[b]	--
UPR-300-46_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	9.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.2	6.17E+07	No
UPR-300-46_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	7.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	29	1.41E+06	No
UPR-300-46_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	36	2.26E+06	No
UPR-300-46_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	4.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,897	101,630[c]	No
UPR-300-46_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.8	--[d]	--
UPR-300-46_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
UPR-300-46_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--

Notes:

a. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

Table A-4. Comparison of EPC from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?

b. The calculated soil screening level for the analyte is considered non-representative because: (1) breakthrough is simulated within 1,000 years for some soil columns while other soil columns (a majority) show no breakthrough (breakthrough defined as concentrations below 1E-04 µg/L or activity below 1E-04 pCi/L), and/or (2) the calculated residual mass of contaminant in the pore volume is high enough to represent a substantial (and physically improbable) reduction in porosity.

c. Due to the complex geochemistry of uranium in 300 Area source operable unit soils, uranium SSLs were derived using a site-speicific two-dimensional model as described in ECF-300FF5-11-0151.

d. Uranium isotopes are accounted for by converting from activity-based (pCi/g) to mass-based (µg/kg) concentrations and then summing to provide a mass-based total uranium exposure point concentration (identified as Total_U_Isotopes), as described in ECF-300NPL-11-0137, Computation of Exposure Point Concentrations for the 300-FF-2 Source Operable Unit.

e. The soil screening level for Total Petroleum Hydrocarbons is a default screening level obtained from WAC 173-340-900, Table 747-5, "Residual Saturation Screening Levels for TPH."

f. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

-- = Not applicable or no value

Table A-5. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300 ASH PITS_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	52	133	No
300 ASH PITS_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	96	--[b]	--
300 ASH PITS_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	76	1.50E+06	No
300-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	13,500	11,726	Yes
300-10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	200	--[b]	--
300-10_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	230	1.50E+06	No
300-10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,078	2.64E+06[c]	No
300-10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
300-109_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	122	--[b]	--
300-109_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	40	--[b]	--
300-109_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.2	--[b]	--
300-109_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	2.3	--[b]	--
300-109_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	1.8	--[b]	--
300-109_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	14	--[b]	--
300-109_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	22	8,451	No
300-109_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	1.6	--[b]	--
300-109_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,108	2.64E+06[c]	No
300-109_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	--[d]	--
300-109_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	37	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	19	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	2.1	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.3	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.3	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	5.1	2.82E+08	No
300-109_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	29	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	µg/kg	7.0	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,450	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,877	2.64E+06[c]	No
300-109_Staging Pile Area_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	2.5	--[d]	--
300-109_Staging Pile Area_Focused	Rad	Uranium-238	U-238	pCi/g	2.3	--[d]	--
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	120,000	--[e]	--
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	230,000	--[e]	--
300-23_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	52,000	--[e]	--
300-259_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	322	252,032	No
300-259_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,876	2.64E+06[c]	No
300-259_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	479,584	6.41E+07	No
300-259_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.6	--[d]	--
300-259_Shallow	Rad	Uranium-238	U-238	pCi/g	1.3	--[d]	--
300-260_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	922	252,032	No
300-260_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	8,360	--[e]	--
300-260_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	73,300	3.40E+06	No
300-260_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	18,300	1.48E+06	No
300-260_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	537	--[b]	--
300-260_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	206	--[b]	--
300-260_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,800	2.64E+06[c]	No
300-260_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	77,400	6.41E+07	No
300-260_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.25	--[d]	--
300-260_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	4.3	--[d]	--
300-272_Overburden_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	13,100	--[e]	--
300-272_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	43,100	--[e]	--
300-275_Shallow_1	non-Rad	Acenaphthene	83-32-9	µg/kg	960	4.94E+07	No
300-275_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	260	252,032	No
300-275_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.3	--[b]	--
300-275_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.9	--[b]	--
300-275_Shallow_1	non-Rad	Chrysene	218-01-9	µg/kg	2.2	--[b]	--
300-275_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	42,923	3.40E+06	No
300-275_Shallow_1	non-Rad	Fluoranthene	206-44-0	µg/kg	2,300	2.82E+08	No
300-275_Shallow_1	non-Rad	Fluorene	86-73-7	µg/kg	81	1.06E+08	No
300-275_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	17	8,451	No
300-275_Shallow_1	non-Rad	Strontium	7440-24-6	µg/kg	20,196	--[b]	--
300-275_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,483	--[b]	--
300-275_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	7.7	--[d]	--
300-275_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.0	--[d]	--
300-275_Shallow_1	Rad	Uranium-238	U-238	pCi/g	7.4	--[d]	--
300-275_Shallow_2	non-Rad	Acenaphthene	83-32-9	µg/kg	3.6	4.94E+07	No
300-275_Shallow_2	non-Rad	Fluoranthene	206-44-0	µg/kg	56	2.82E+08	No
300-275_Shallow_2	non-Rad	Fluorene	86-73-7	µg/kg	2.6	1.06E+08	No
300-275_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	28	8,451	No
300-275_Shallow_2	non-Rad	Strontium	7440-24-6	µg/kg	27,081	--[b]	--
300-275_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,149	--[b]	--
300-275_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,725	2.64E+06[c]	No
300-275_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
300-275_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
300-275_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.2	--[d]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1016	12674-11-2	µg/kg	10	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	16	143	No
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	190	133	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	84	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	17	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	228	1.50E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	16	8,451	No
300-33, 300-41, 300-256_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	2.9	1,931	No

Table A-5. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300-33, 300-41, 300-256_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	486	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Silver	7440-22-4	µg/kg	782	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	7,260	2.64E+06[c]	No
300-33, 300-41, 300-256_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.1	--[d]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.34	--[d]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-238	U-238	pCi/g	2.1	--[d]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	330	133	Yes
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	385	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2.2	1,931	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,460	2.64E+06[c]	No
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	3.0	--[d]	--
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	2.2	--[d]	--
300-37_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	100	--[b]	--
300-37_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,200	--[b]	--
300-44_Overburden_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	9,100	11,726	No
300-44_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	4,100	252,032	No
300-44_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	16,900	11,726	Yes
300-45_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	86	--[b]	--
300-45_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	290	--[b]	--
300-45_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,600	2.64E+06[c]	No
300-45_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2	--[d]	--
300-49_Overburden	non-Rad	1,2,4-Trichlorobenzene	120-82-1	µg/kg	31	37,238	No
300-49_Overburden	non-Rad	1,4-Dichlorobenzene	106-46-7	µg/kg	29	164,520	No
300-49_Overburden	non-Rad	2,4-Dinitrotoluene	121-14-2	µg/kg	19	330	No
300-49_Overburden	non-Rad	2-Chlorophenol	95-57-8	µg/kg	51	393,603	No
300-49_Overburden	non-Rad	4-Chloro-3-methylphenol	59-50-7	µg/kg	46	1.87E+08	No
300-49_Overburden	non-Rad	Acenaphthene	83-32-9	µg/kg	31	4.94E+07	No
300-49_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	232	252,032	No
300-49_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,008	--[b]	--
300-49_Overburden	non-Rad	Copper	7440-50-8	µg/kg	536,000	3.40E+06	No
300-49_Overburden	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	52	3.56E+07	No
300-49_Overburden	non-Rad	Lead	7439-92-1	µg/kg	36,964	1.48E+06	No
300-49_Overburden	non-Rad	n-Nitrosodi-n-dipropylamine	621-64-7	µg/kg	40	330	No
300-49_Overburden	non-Rad	Pentachlorophenol	87-86-5	µg/kg	50	1,980	No
300-49_Overburden	non-Rad	Phenol	108-95-2	µg/kg	50	6.21E+06	No
300-49_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	40	--[b]	--
300-49_Overburden	non-Rad	Silver	7440-22-4	µg/kg	703	--[b]	--
300-49_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	141,984	6.41E+07	No
300-49_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	176	252,032	No
300-49_Shallow	non-Rad	Silver	7440-22-4	µg/kg	621	--[b]	--
300-49_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
300-49_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
300-49_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
300-50_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	33	--[b]	--
300-50_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	229	--[b]	--
300-50_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	6,897	11,726	No
300-50_Overburden	non-Rad	Copper	7440-50-8	µg/kg	64,527	3.40E+06	No
300-50_Overburden	non-Rad	Silver	7440-22-4	µg/kg	1,202	--[b]	--
300-50_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	17,919	2.64E+06[c]	No
300-50_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	6.0	--[d]	--
300-50_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.45	--[d]	--
300-50_Overburden	Rad	Uranium-238	U-238	pCi/g	6.0	--[d]	--
300-50_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	3,000	252,032	No
300-50_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	126	--[b]	--
300-50_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	19	--[b]	--
300-50_Shallow	non-Rad	Silver	7440-22-4	µg/kg	2,992	--[b]	--
300-50_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	22,938	2.64E+06[c]	No
300-50_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	7.9	--[d]	--
300-50_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.66	--[d]	--
300-50_Shallow	Rad	Uranium-238	U-238	pCi/g	8.4	--[d]	--
316-1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	40,572	2.64E+06[c]	No
316-1_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.32	--[b]	--
316-1_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	13	--[d]	--
316-1_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
316-1_Overburden	Rad	Uranium-238	U-238	pCi/g	13	--[d]	--
316-1_Shallow_1	non-Rad	Aroclor-1248	12672-29-6	µg/kg	3,000	133	Yes
316-1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	19,014	11,726	Yes
316-1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	69	--[b]	--
316-1_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	98	1.50E+06	No
316-1_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	83,027	2.64E+06[c]	No
316-1_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.2	--[d]	--
316-1_Shallow_1	Rad	Uranium-238	U-238	pCi/g	28	--[d]	--
316-1_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	490	252,032	No
316-1_Shallow_3	non-Rad	Aroclor-1254	11097-69-1	µg/kg	98	--[b]	--
316-1_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	342	--[b]	--
316-1_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	50,455	--[b]	--
316-1_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	1.37E+06	3.40E+06	No
316-1_Shallow_3	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	3.2	--[b]	--
316-1_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	14,409	1.48E+06	No
316-1_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	1,105	8,451	No
316-1_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	94,656	--[b]	--
316-1_Shallow_3	non-Rad	Phenol	108-95-2	µg/kg	28	6.21E+06	No
316-1_Shallow_3	non-Rad	Selenium	7782-49-2	µg/kg	1,444	302,457	No

Table A-5. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
316-1_Shallow_3	non-Rad	Silver	7440-22-4	µg/kg	13,196	--[b]	--
316-1_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	63,074	2.64E+06[c]	No
316-1_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	82,016	6.41E+07	No
316-1_Shallow_3	Rad	Cobalt-60	10198-40-0	pCi/g	2.3	--[b]	--
316-1_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	23	--[d]	--
316-1_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	2.6	--[d]	--
316-1_Shallow_3	Rad	Uranium-238	U-238	pCi/g	21	--[d]	--
316-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	µg/kg	62	--[b]	--
316-1_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	42,963	2.64E+06[c]	No
316-1_Shallow_4	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--
316-1_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	16	--[d]	--
316-1_Shallow_4	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
316-1_Shallow_4	Rad	Uranium-238	U-238	pCi/g	14	--[d]	--
316-2_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	210,452	2.64E+06[c]	No
316-2_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.092	--[b]	--
316-2_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	86	--[d]	--
316-2_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	12	--[d]	--
316-2_Shallow_1	Rad	Uranium-238	U-238	pCi/g	69	--[d]	--
316-2_Shallow_2	non-Rad	Aroclor-1248	12672-29-6	µg/kg	697	133	Yes
316-2_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	µg/kg	42	--[b]	--
316-2_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	110	--[b]	--
316-2_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	291,369	2.64E+06[c]	No
316-2_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.45	--[b]	--
316-2_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	115	--[d]	--
316-2_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	11	--[d]	--
316-2_Shallow_2	Rad	Uranium-238	U-238	pCi/g	96	--[d]	--
316-2_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	8,000	11,726	No
316-2_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	260	--[b]	--
316-2_Shallow_3	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	180	1.50E+06	No
316-2_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	73,174	2.64E+06[c]	No
316-2_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.91	--[d]	--
316-2_Shallow_3	Rad	Uranium-238	U-238	pCi/g	24	--[d]	--
316-5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	38	--[b]	--
316-5_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	146	--[b]	--
316-5_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	100	1.50E+06	No
316-5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	271,835	2.64E+06[c]	No
316-5_Shallow_1	Rad	Americium-241	14596-10-2	pCi/g	0.48	--[b]	--
316-5_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	2.3	--[b]	--
316-5_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	19	--[d]	--
316-5_Shallow_1	Rad	Uranium-238	U-238	pCi/g	89	--[d]	--
316-5_Shallow_2	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	140	210	No
316-5_Shallow_2	non-Rad	2-Butoxyethanol	111-76-2	µg/kg	240	2.58E+07	No
316-5_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	180	--[b]	--
316-5_Shallow_2	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	110	1.50E+06	No
316-5_Shallow_2	non-Rad	Chrysene	218-01-9	µg/kg	38	--[b]	--
316-5_Shallow_2	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	146	3.56E+07	No
316-5_Shallow_2	non-Rad	Silver	7440-22-4	µg/kg	3,600	--[b]	--
316-5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	204,701	2.64E+06[c]	No
316-5_Shallow_2	Rad	Americium-241	14596-10-2	pCi/g	0.12	--[b]	--
316-5_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	1.7	--[b]	--
316-5_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--
316-5_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	9.0	--[d]	--
316-5_Shallow_2	Rad	Uranium-238	U-238	pCi/g	68	--[d]	--
316-5_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	57	133	No
316-5_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	70	--[b]	--
316-5_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--[b]	--
316-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	190	--[b]	--
316-5_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	1,500	3.56E+07	No
316-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	138,095	2.64E+06[c]	No
316-5_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.8	--[b]	--
316-5_Shallow_Focused	Rad	Europium-155	14391-16-3	pCi/g	0.072	--[b]	--
316-5_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	7.7	--[d]	--
316-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	45	--[d]	--
331 LSLDF_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	25	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	590	2.28E+08	No
331 LSLDF_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	0.56	148	No
331 LSLDF_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	µg/kg	0.39	53	No
331 LSLDF_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	360	252,032	No
331 LSLDF_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	850	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	910	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	340	1.50E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Dieldrin	60-57-1	µg/kg	13	26	No
331 LSLDF_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	98	3.56E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan I	959-98-8	µg/kg	1.9	1,433	No
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	µg/kg	3.1	1,433	No
331 LSLDF_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	110	8,451	No
331 LSLDF_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	µg/kg	3.3	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	11	1,931	No
331 LSLDF_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	590	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	9,500	3.03E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,100	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	137,000	6.41E+07	No
600-243_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	µg/kg	279	4.65E+06	No

Table A-5. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
600-243_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	31	--[b]	--
600-243_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	1,300	252,032	No
600-243_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	27	--[b]	--
600-243_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	18	--[b]	--
600-243_Shallow	non-Rad	Barium	7440-39-3	µg/kg	292,072	--[b]	--
600-243_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	43	--[b]	--
600-243_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	43	--[b]	--
600-243_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	46	--[b]	--
600-243_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	32	--[b]	--
600-243_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	2,079	--[b]	--
600-243_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	432	--[b]	--
600-243_Shallow	non-Rad	Boron	7440-42-8	µg/kg	294,463	--[e]	--
600-243_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	793	176,066	No
600-243_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	63	--[b]	--
600-243_Shallow	non-Rad	Copper	7440-50-8	µg/kg	53,981	3.40E+06	No
600-243_Shallow	non-Rad	Dibenzofuran	132-64-9	µg/kg	78	246,969	No
600-243_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	37	3.56E+07	No
600-243_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	79	2.82E+08	No
600-243_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	28	--[b]	--
600-243_Shallow	non-Rad	Lead	7439-92-1	µg/kg	40,139	1.48E+06	No
600-243_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	1,869	--[b]	--
600-243_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	204	6.97E+07	No
600-243_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	21,395	--[b]	--
600-243_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	70	--[b]	--
600-243_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	5,709	302,457	No
600-243_Shallow	non-Rad	Silver	7440-22-4	µg/kg	500	--[b]	--
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	95,319	--[e]	--
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	334,524	--[e]	--
600-243_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	84,099	6.41E+07	No
600-47_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,303	2.64E+06[c]	No
600-47_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	--[d]	--
600-47_Shallow	Rad	Uranium-238	U-238	pCi/g	1.6	--[d]	--
618-1_Deep	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,760	--[b]	--
618-1_Deep	non-Rad	Aroclor-1260	11096-82-5	µg/kg	294	--[b]	--
618-1_Deep	non-Rad	Barium	7440-39-3	µg/kg	299,000	--[b]	--
618-1_Deep	non-Rad	Copper	7440-50-8	µg/kg	46,300	3.40E+06	No
618-1_Deep	non-Rad	Lead	7439-92-1	µg/kg	58,400	1.48E+06	No
618-1_Deep	non-Rad	Mercury	7439-97-6	µg/kg	1,180	8,451	No
618-1_Deep	non-Rad	Molybdenum	7439-98-7	µg/kg	493	--[b]	--
618-1_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	220	3.03E+06	No
618-1_Deep	non-Rad	Uranium	7440-61-1	µg/kg	37,400	2.64E+06[c]	No
618-1_Deep	non-Rad	Zinc	7440-66-6	µg/kg	134,000	6.41E+07	No
618-1_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	33	--[d]	--
618-1_Deep	Rad	Uranium-235	15117-96-1	pCi/g	2.7	--[d]	--
618-1_Deep	Rad	Uranium-238	U-238	pCi/g	32	--[d]	--
618-1_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	407	252,032	No
618-1_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1.24E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	99	--[b]	--
618-1_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	1.87E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Boron	7440-42-8	µg/kg	6,620	--[e]	--
618-1_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,030	176,066	No
618-1_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	18,900	--[b]	--
618-1_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	68,700	3.40E+06	No
618-1_Deep_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	3,300	--[b]	--
618-1_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	333,000	1.48E+06	No
618-1_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	8,940	8,451	Yes
618-1_Deep_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	2,140	--[b]	--
618-1_Deep_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,560	3.03E+06	No
618-1_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,290	--[b]	--
618-1_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	209,000	2.64E+06[c]	No
618-1_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	82,000	6.41E+07	No
618-1_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	6.5	--[b]	--
618-1_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	70	--[d]	--
618-1_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.5	--[d]	--
618-1_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	65	--[d]	--
618-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	264	--[b]	--
618-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	54	--[b]	--
618-1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	31	8,451	No
618-1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	300	3.03E+06	No
618-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,224	2.64E+06[c]	No
618-1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	--[d]	--
618-1_Shallow	Rad	Uranium-238	U-238	pCi/g	1.5	--[d]	--
618-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	1.22E+07	--[b]	--
618-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	455	252,032	No
618-1_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	35	133	No
618-1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	981	--[b]	--
618-1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	56	--[b]	--
618-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	19,500	--[b]	--
618-1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	23,800	3.40E+06	No
618-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	198	8,451	No
618-1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	260	3.03E+06	No
618-1_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,120	--[b]	--
618-1_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	7,080	2.64E+06[c]	No
618-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	68,100	6.41E+07	No

Table A-5. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-1_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-1_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.99	--[d]	--
618-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	8.2	--[d]	--
618-12_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	8,557	11,726	No
618-12_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	63	--[b]	--
618-12_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	60	1.50E+06	No
618-12_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	32,092	2.64E+06[c]	No
618-12_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.47	--[d]	--
618-12_Shallow	Rad	Uranium-238	U-238	pCi/g	11	--[d]	--
618-13_Shallow	non-Rad	Acetone	67-64-1	µg/kg	8.6	2.28E+08	No
618-13_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	312	252,032	No
618-13_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	5.1	1,931	No
618-13_Shallow	non-Rad	Tin	7440-31-5	µg/kg	1,050	--[b]	--
618-13_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	--[d]	--
618-13_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
618-13_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	5.9	2.28E+08	No
618-13_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	233	252,032	No
618-13_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	150	6,000[f]	No
618-13_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	5.0	1,931	No
618-13_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	745	--[b]	--
618-13_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
618-2_Deep	non-Rad	Tin	7440-31-5	µg/kg	2,900	--[b]	--
618-2_Deep	non-Rad	Uranium	7440-61-1	µg/kg	501,000	2.64E+06[c]	No
618-2_Deep	Rad	Americium-241	14596-10-2	pCi/g	7.9	--[b]	--
618-2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	1.5	--[b]	--
618-2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	91	--[b]	--
618-2_Deep	Rad	Plutonium-241	14119-32-5	pCi/g	42	--[b]	--
618-2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	12	227,428	No
618-2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	161	--[d]	--
618-2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.78	--[d]	--
618-2_Deep	Rad	Uranium-238	U-238	pCi/g	165	--[d]	--
618-2_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	6.9	--[b]	--
618-2_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	27	--[b]	--
618-2_Deep_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	18	3.56E+07	No
618-2_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	1,200	302,457	No
618-2_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	600	--[b]	--
618-2_Deep_Focused	non-Rad	Tin	7440-31-5	µg/kg	42,500	--[b]	--
618-2_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	148,000	2.64E+06[c]	No
618-2_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	9.2	--[b]	--
618-2_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.1	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-238	13981-16-3	pCi/g	1.6	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	92	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-241	14119-32-5	pCi/g	33	--[b]	--
618-2_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	7.2	227,428	No
618-2_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	48	--[d]	--
618-2_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	2.4	--[d]	--
618-2_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	50	--[d]	--
618-2_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	1,000	302,457	No
618-2_Overburden	non-Rad	Tin	7440-31-5	µg/kg	2,700	--[b]	--
618-2_Shallow	non-Rad	Tin	7440-31-5	µg/kg	2,400	--[b]	--
618-2_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	4,530	2.64E+06[c]	No
618-2_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.81	--[b]	--
618-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.2	--[b]	--
618-2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	7.7	--[b]	--
618-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.2	--[d]	--
618-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.21	--[d]	--
618-2_Shallow	Rad	Uranium-238	U-238	pCi/g	2.2	--[d]	--
618-2_Staging Pile	non-Rad	Uranium	7440-61-1	µg/kg	5,022	2.64E+06[c]	No
618-2_Staging Pile	Rad	Americium-241	14596-10-2	pCi/g	0.82	--[b]	--
618-2_Staging Pile	Rad	Plutonium-239/240	PU-239/240	pCi/g	10	--[b]	--
618-2_Staging Pile	Rad	Tritium	10028-17-8	pCi/g	2.3	9,176	No
618-2_Staging Pile	Rad	Uranium-233/234	U-233/234	pCi/g	2.0	--[d]	--
618-2_Staging Pile	Rad	Uranium-235	15117-96-1	pCi/g	0.12	--[d]	--
618-2_Staging Pile	Rad	Uranium-238	U-238	pCi/g	2.0	--[d]	--
618-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	238,577	2.64E+06[c]	No
618-3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	80	--[d]	--
618-3_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.8	--[d]	--
618-3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	79	--[d]	--
618-4_Deep	non-Rad	Lead	7439-92-1	µg/kg	20,000	1.48E+06	No
618-4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	64,506	2.64E+06[c]	No
618-4_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	20	--[d]	--
618-4_Deep	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
618-4_Deep	Rad	Uranium-238	U-238	pCi/g	22	--[d]	--
618-4_Deep_Focused	non-Rad	2-Butanone	78-93-3	µg/kg	130	1.71E+08	No
618-4_Deep_Focused	non-Rad	Acetone	67-64-1	µg/kg	16	2.28E+08	No
618-4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,600	--[b]	--
618-4_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	4,700	--[b]	--
618-4_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,500	176,066	No
618-4_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	27,700	--[b]	--
618-4_Deep_Focused	non-Rad	Diethyl ether	60-29-7	µg/kg	1.0	3.98E+07	No
618-4_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	24,900	1.48E+06	No
618-4_Deep_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	40	1,931	No
618-4_Deep_Focused	non-Rad	Phenol	108-95-2	µg/kg	110	6.21E+06	No

Table A-5. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-4_Deep_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	24	1,316	No
618-4_Deep_Focused	non-Rad	Toluene	108-88-3	µg/kg	4.8	2.35E+06	No
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	34,000	--[e]	--
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - kerosene range	TPHKEROSENE	µg/kg	42,000	--[e]	--
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	65	--[e]	--
618-4_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	20,777	2.64E+06[c]	No
618-4_Deep_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	3,511	No
618-4_Deep_Focused	non-Rad	Trichloromonofluoromethane	75-69-4	µg/kg	12	2.90E+07	No
618-4_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	7.2	--[d]	--
618-4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.51	--[d]	--
618-4_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	6.9	--[d]	--
618-4_Overburden_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,197	2.64E+06[c]	No
618-4_Overburden_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
618-4_Overburden_2	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
618-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	49,000	1.48E+06	No
618-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	7,456	2.64E+06[c]	No
618-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	3.2	--[d]	--
618-4_Shallow	Rad	Uranium-238	U-238	pCi/g	3.1	--[d]	--
618-5_Deep	non-Rad	Lead	7439-92-1	µg/kg	82,300	1.48E+06	No
618-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	26,618	2.64E+06[c]	No
618-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	8.6	--[d]	--
618-5_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.46	--[d]	--
618-5_Deep	Rad	Uranium-238	U-238	pCi/g	8.9	--[d]	--
618-5_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	1,800	252,032	No
618-5_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	579,000	--[b]	--
618-5_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	33	8,451	No
618-5_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	2,270	302,457	No
618-5_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	36,540	2.64E+06[c]	No
618-5_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-5_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.48	--[d]	--
618-5_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	12	--[d]	--
618-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	9,773	2.64E+06[c]	No
618-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	4.1	--[d]	--
618-5_Overburden	Rad	Uranium-238	U-238	pCi/g	4.6	--[d]	--
618-5_Staging Pile_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,364	2.64E+06[c]	No
618-5_Staging Pile_4	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	--[d]	--
618-5_Staging Pile_4	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
618-5_Staging Pile_5	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,326	2.64E+06[c]	No
618-5_Staging Pile_5	Rad	Uranium-233/234	U-233/234	pCi/g	1.5	--[d]	--
618-5_Staging Pile_5	Rad	Uranium-235	15117-96-1	pCi/g	0.17	--[d]	--
618-5_Staging Pile_5	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
618-7_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	560	252,032	No
618-7_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	14,567	1.48E+06	No
618-7_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	44	8,451	No
618-7_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	20,977	--[b]	--
618-7_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,547	--[b]	--
618-7_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	10,814	2.64E+06[c]	No
618-7_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	3.6	--[d]	--
618-7_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	0.36	--[d]	--
618-7_Shallow_1	Rad	Uranium-238	U-238	pCi/g	3.6	--[d]	--
618-7_Shallow_2	non-Rad	Antimony	7440-36-0	µg/kg	660	252,032	No
618-7_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	20	8,451	No
618-7_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,500	--[b]	--
618-7_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	450	252,032	No
618-7_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	20	8,451	No
618-7_Shallow_3	non-Rad	Tin	7440-31-5	µg/kg	1,800	--[b]	--
618-7_Shallow_4	non-Rad	Antimony	7440-36-0	µg/kg	250	252,032	No
618-7_Shallow_4	non-Rad	Tin	7440-31-5	µg/kg	710	--[b]	--
618-7_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	150	4.94E+07	No
618-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	980	252,032	No
618-7_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	6.7	133	No
618-7_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	88	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	66	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	52	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	11	--[b]	--
618-7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	470	--[b]	--
618-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	6,200	176,066	No
618-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	65,900	--[b]	--
618-7_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	69	--[b]	--
618-7_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	25,000	3.40E+06	No
618-7_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	45	--[b]	--
618-7_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	33	3.56E+07	No
618-7_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	48	2.82E+08	No
618-7_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	20	8,451	No
618-7_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	410	--[b]	--
618-7_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,200	--[b]	--
618-7_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	680,000	--[e]	--
618-7_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	19,563	2.64E+06[c]	No
618-7_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-7_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.97	--[d]	--
618-7_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	6.4	--[d]	--
618-8_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	846	302,457	No
618-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	--[d]	--

Table A-5. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-9_Shallow_Focused	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	110	210	No
618-9_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	680	2.28E+08	No
618-9_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	390	148	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1016	12674-11-2	µg/kg	1,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1221	11104-28-2	µg/kg	1,900	17	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1232	11141-16-5	µg/kg	1,900	17	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1242	53469-21-9	µg/kg	1,900	143	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,900	133	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	11,600	11,726	No
618-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	5,200	--[b]	--
618-9_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	2,700	1.50E+06	No
618-9_Shallow_Focused	non-Rad	Chlordane	57-74-9	µg/kg	69	--[b]	--
618-9_Shallow_Focused	non-Rad	Chloroform	67-66-3	µg/kg	9.0	5,207	No
618-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	7,200	3.56E+07	No
618-9_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	44	--[b]	--
618-9_Shallow_Focused	non-Rad	Hexachlorobutadiene	87-68-3	µg/kg	760	--[b]	--
618-9_Shallow_Focused	non-Rad	Hexachloroethane	67-72-1	µg/kg	17,000	29,166	No
618-9_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	330	8,451	No
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	1,931	Yes
618-9_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	1.67E+06	1.36E+07	No
618-9_Shallow_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	920	1,316	No
618-9_Shallow_Focused	non-Rad	Toluene	108-88-3	µg/kg	9.0	2.35E+06	No
618-9_Shallow_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	3,511	No
618-9_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	3.0	--[d]	--
628-4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	61	--[b]	--
628-4_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	42	143	No
628-4_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,115	133	Yes
628-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	243	--[b]	--
628-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	38	--[b]	--
628-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	99,167	1.48E+06	No
628-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
628-4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.11	--[d]	--
UPR-300-17_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	117	4.94E+07	No
UPR-300-17_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	7.0	--[b]	--
UPR-300-17_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	359	252,032	No
UPR-300-17_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,970	133	Yes
UPR-300-17_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	450	--[b]	--
UPR-300-17_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	113	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	59	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	44	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	33	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	9.9	--[b]	--
UPR-300-17_Shallow	non-Rad	Boron	7440-42-8	µg/kg	3,903	--[e]	--
UPR-300-17_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	39	--[b]	--
UPR-300-17_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	35	2.82E+08	No
UPR-300-17_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.9	1.06E+08	No
UPR-300-17_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	5.9	--[b]	--
UPR-300-17_Shallow	non-Rad	Lead	7439-92-1	µg/kg	11,240	1.48E+06	No
UPR-300-17_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	69	8,451	No
UPR-300-17_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	48	6.97E+07	No
UPR-300-17_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	563,654	--[b]	--
UPR-300-17_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	34	--[b]	--
UPR-300-17_Shallow	non-Rad	Silver	7440-22-4	µg/kg	340	--[b]	--
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,950	--[e]	--
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	210,420	--[e]	--
UPR-300-17_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,420	2.64E+06[c]	No
UPR-300-17_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	157,172	6.41E+07	No
UPR-300-17_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	6.1	--[d]	--
UPR-300-17_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.91	--[d]	--
UPR-300-17_Shallow	Rad	Uranium-238	U-238	pCi/g	4.0	--[d]	--
UPR-300-46_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	13	4.94E+07	No
UPR-300-46_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	381	252,032	No
UPR-300-46_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	879	133	Yes
UPR-300-46_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	490	--[b]	--
UPR-300-46_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	84	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	3.9	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	5.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.8	--[b]	--
UPR-300-46_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	5.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	1.3	--[b]	--
UPR-300-46_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	9.6	2.82E+08	No
UPR-300-46_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.2	1.06E+08	No
UPR-300-46_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	7.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	29	8,451	No
UPR-300-46_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	36	6.97E+07	No
UPR-300-46_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	4.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,897	2.64E+06[c]	No
UPR-300-46_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.8	--[d]	--
UPR-300-46_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
UPR-300-46_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--

Notes:

a. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

Table A-5. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?

b. The calculated soil screening level for the analyte is considered non-representative because: (1) breakthrough is simulated within 1,000 years for some soil columns while other soil columns (a majority) show no breakthrough (breakthrough defined as concentrations below 1E-04 µg/L or activity below 1E-04 pCi/L), and/or (2) the calculated residual mass of contaminant in the pore volume is high enough to represent a substantial (and physically improbable) reduction in porosity.

c. Due to the complex geochemistry of uranium in 300 Area source operable unit soils, uranium SSLs were derived using a site-speicific two-dimensional model as described in ECF-300FF5-11-0151.

d. Uranium isotopes are accounted for by converting from activity-based (pCi/g) to mass-based (µg/kg) concentrations and then summing to provide a mass-based total uranium exposure point concentration (identified as Total_U_Isotopes), as described in ECF-300NPL-11-0137, Computation of Exposure Point Concentrations for the 300-FF-2 Source Operable Unit.

e. A soil screening level is not calculated because a surface water cleanup level or surface water standard is not available for the analyte.

f. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

-- = Not applicable or no value

ECF-300NPL-11-0155
Revision 1

Comparison of the 300-FF-2 Source Operable Unit Exposure Point Concentrations to Preliminary Remediation Goals Protective of Groundwater and Preliminary Remediation Goals Protective of Surface Water

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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Richland, Washington 99352

**Approved for Public Release;
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Revision 1

Comparison of the 300-FF-2 Source Operable Unit Exposure Point Concentrations to Preliminary Remediation Goals Protective of Groundwater and Preliminary Remediation Goals Protective of Surface Water

Document Type: ENV Program/Project: EP & SP

J. Hulstrom
INTERA

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Assistant Secretary for Environmental Management

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Environmental Calculation Cover Page

Part 1: Completed by the Responsible Manager

Project: 100 Areas and 300 Area Remedial Investigation/Feasibility Study Reports **Date: October 22, 2012**

Calculation Title & Description: **Comparison of the 300-FF-2 Source Operable Unit Exposure Point Concentrations to Preliminary Remediation Goals Protective of Groundwater and Preliminary Remediation Goals Protective of Surface Water**

Preparer: Jason Hulstrom	**Basis of Qualification: Education and Experience**
Checker: Doug Evans	**Basis of Qualification: Education and Experience**
Senior Reviewer: Doug Evans	**Basis of Qualification: Education and Experience**

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Calculation No.: ECF-300NPL-11-0155 **Revision No.:** Rev. 1

Revision History:

Revision No.	Description	Date	Affected Pages
Draft A	Replaced STOMP 1D 50:50 PRGs with STOMP 1D 100:0 base case PRGs for analytes other than total uranium. Updated PRGs for total uranium. Incorporated changes to COPCs.	11/10/2011	All
Rev. 0	Incorporated revised COPCs from ECF-300NPL-11-0154 (Rev. 0) and revised PRGs calculated with STOMP 1D 70:30/100:0 contaminant source model (ECF-300FF5-11-0153, Rev. 2) and STOMP 2D uranium source model (ECF-300FF5-11-0151, Rev. 2).	5/10/2012	All
Rev. 1	Incorporated revised uranium COPCs from ECF-300NPL-11-0154 (Rev. 1) and revised uranium 2-D PRG values for GWP and SWP.	10/22/2012	All

Part 3: Document Review & Approval:

Preparer:

Jason Hulstrom / Environmental Scientist

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Doug Evans/ Senior Risk Assessor

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SIGNATURE DATE

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Doug Evans 10/22/2012

SIGNATURE DATE

CH2MHILL Plateau Remediation Company

Environmental Calculation Cover Page

Part 1: Completed by the Responsible Manager

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Revision No.: Rev. 1

Responsible Manager: Alaa Aly/Risk and Modeling Integration Manager

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10/22/12

DATE

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Terms

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
COPC	Contaminant of potential concern
DOE	U.S. Department of Energy
ECF	Environmental Calculation File
EPA	Environmental Protection Agency
EPC	Exposure point concentration
FS	Feasibility study
OU	Operable unit
PRG	Preliminary Remediation Goal
RI	Remedial investigation
STOMP	Subsurface Transport Over Multiple Phases

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1 Purpose

This environmental calculation documents the methodology used to identify waste sites in the 300 Area where post-remediation soil sample results exceed soil preliminary remediation goals (PRGs) for the protection of groundwater and the protection of surface water. The 300 Area is associated with two source operable units (OUs): the 300-FF-1 OU and 300-FF-2 OU. These OUs are referred to collectively herein as the 300 Area Source OU. The exposure point concentrations (EPCs) for identified constituents of potential concern (COPCs) for each waste site decision unit in the 300 Area Source OU are compared to both groundwater protective and surface water protective PRGs for a native vegetation recharge scenario and an industrial recharge scenario. The waste sites where EPCs exceed a PRG will be evaluated through the remedial investigation/feasibility study (RI/FS) process being conducted for the 100 Areas and 300 Area under the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA).

This environmental calculation supports DOE/RL-2010-99, *Remedial Investigation/Feasibility Study for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units*. A summary based upon the comparison of EPCs to PRGs described in this environmental calculation will be presented in the RI/FS report.

2 Background

Based on agreements with the Senior Executive Council, modeling with the STOMP simulator (PNNL-15782, *STOMP Subsurface Transport Over Multiple Phases, Version 4.0: User's Guide*) was performed to provide a site-specific basis for estimating PRGs for groundwater protection and surface water protection. PRGs for the protection of groundwater and the protection of surface water were estimated with the STOMP 1D 70:30/100:0 Contaminant Source Model, which is a one-dimensional model that assumes either 70 percent contamination of the vadose zone (upper 70 percent contaminated, lower 30 percent uncontaminated [70:30]) or 100 percent contamination of the vadose zone (zero percent uncontaminated [100:0]) beneath a backfilled waste site. Source distributions are assigned based on analyte distribution coefficients (K_d). A 70:30 source distribution is assumed for analytes with a $K_d \geq 2$ mL/g and a 100:0 source distribution is assumed for analytes with a $K_d < 2$ mL/g. The STOMP 1D 70:30/100:0 Contaminant Source Model is an OU-specific model that assumes all contamination moves downward with no dispersion, volatilization, or credit for mixing with river water.

For determination of PRGs, the STOMP 1D 70:30/100:0 Contaminant Source Model was implemented for two separate recharge scenarios: a native vegetation recharge scenario and an industrial recharge scenario. The native vegetation recharge scenario is an infiltration rate history that trends from current bare soil surface conditions (operational land cover) to shrub steppe native vegetation recharge rates. The industrial recharge scenario is an infiltration rate history that trends from current bare soil surface conditions (operational land cover) to a permanently disturbed soil with cheat grass vegetation cover. Other modeling conditions used for the one-dimensional 70:30/100:0 model are described in ECF-300FF5-11-0153, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for 300 Area Source Areas*.

Due to the geochemical complexity of uranium in 300 Area Source OU soils, as well as uncertainty associated with the OU-specific uranium K_d, the uranium PRGs for the protection of groundwater and the protection of surface water were estimated using the STOMP 2D Uranium Source Model. The STOMP 2D Uranium Source Model is a site-specific, two-dimensional model developed to simulate the fate and transport of uranium in the 300 Area vadose zone and unconfined groundwater aquifer. The 2D uranium model was used to calculate uranium PRGs for the same two recharge scenarios as discussed above for the one-dimensional model: a native vegetation recharge scenario and an industrial recharge scenario.

Other modeling conditions used for the 2D uranium model are described in ECF-300FF5-11-0151, *Groundwater Flow and Uranium Transport Modeling in Support of the 300 Area FF-5 RI/FS Document*.

Comparisons are conducted herein between EPCs and the PRGs for both groundwater protection and surface water protection for the identified COPCs at each waste site decision unit in the 300-Area Source OU.

3 Methodology

This section describes the methodology used to compare EPCs for identified COPCs at each waste site decision unit to PRGs for groundwater protection and surface water protection.

For all of the COPCs identified at the 300 Area waste site decision units, the following steps are performed:

1. Obtain COPCs for each waste site decision unit in the 300 Area Source OU.
2. Obtain PRGs for the protection of groundwater and the protection of surface water for the STOMP 1D 70:30/100:30 Contaminant Source Model native vegetation recharge scenario.
3. Obtain PRGs for the protection of groundwater and the protection of surface water for the STOMP 1D 70:30/100:30 Contaminant Source Model industrial recharge scenario.
4. Obtain the uranium PRGs for the protection of groundwater and the protection of surface water for the STOMP 2D Uranium Source Model native vegetation recharge scenario.
5. Obtain the uranium PRGs for the protection of groundwater and the protection of surface water for the STOMP 2D Uranium Source Model industrial recharge scenario.
6. Obtain EPC values for each waste site decision unit in the 300 Area Source OU.
7. Individually compare EPCs for each waste site decision unit in the 300 Area Source OU to soil PRGs for the protection of groundwater and the protection of surface water.

4 Assumptions and Inputs

Assumptions and inputs associated with COPCs, PRGs, and EPCs are described below.

Table 4-1 documents the sources of information for the PRGs.

Table 4-1. Reference Sources

Preliminary Remediation Goal	Pathway	Reference
STOMP 1D 70:30/100:0 Contaminant Source Model – native vegetation and industrial recharge scenarios	Groundwater	ECF-300FF5-11-0153
	Surface Water	ECF-300FF5-11-0153
STOMP 2D Uranium Source Model—native vegetation and industrial recharge scenarios	Groundwater	ECF-300FF5-11-0151
	Surface Water	ECF-300FF5-11-0151

Notes:

ECF-300FF5-11-0153, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for 300 Area Source Areas.*

ECF-300FF5-11-0151, *Groundwater Flow and Uranium Transport Modeling in Support of the 300*

Table 4-1. Reference Sources

Preliminary Remediation Goal	Pathway	Reference
Area FF-5 RI/FS Document.		

4.1 Identification of COPCs

For the purposes of this environmental calculation, a COPC is defined as an analyte suspected of being associated with site-related activities, which represents a potential threat to human health or the environment, and whose data are of sufficient quality for use in a quantitative baseline risk assessment.

All analytes identified as exceeding background soil concentrations and soil screening levels in a waste site decision unit are identified as COPCs because the soil sample results represent post-remediation conditions. COPCs for the 300 Area Source OU are identified in ECF-300NPL-11-0154, C*omparison of 300-FF-2 Source Operable Unit Exposure Point Concentrations to Soil Screening Levels Protective of Groundwater and Soil Screening Levels Protective of Surface Water*. The COPCs for groundwater protection for each waste site decision unit are presented in Table 4-2. The COPCs for surface water protection for each waste site decision unit are presented in Table 4-3.

4.2 Preliminary Remediation Goals for the Protection of Groundwater

With the exception of uranium, PRGs for the protection of groundwater at and near the 300 Area Source OU have been derived using the following models:

- STOMP 1D 70:30/100:0 Contaminant Source Model, native vegetation recharge scenario
- STOMP 1D 70:30/100:0 Contaminant Source Model, industrial recharge scenario

The STOMP 1D 70:30/100:0 Contaminant Source Model assumes that either the upper 70 percent of the vadose zone (for $K_d \geq 2$ mL/g analytes) or the entire vadose zone (for $K_d < 2$ mL/g analytes) is contaminated below a clean fill layer. The recharge rate for the native vegetation recharge scenario represents a site with native vegetation (shrub steppe) land cover. The recharge rate for the industrial recharge scenario represents a site with permanently disturbed soil with cheat grass vegetation cover. OU-specific PRGs protective of groundwater for the 300 Area Source OU calculated using the STOMP 1D 70:30/100:0 Contaminant Source Model are documented in ECF-300FF5-11-0153. The STOMP 1D 70:30/100:0 groundwater protective PRGs are presented in Table 4-4.

4.3 Uranium Preliminary Remediation Goal for the Protection of Groundwater

Due to the geochemical complexity of uranium in 300 Area Source OU soils, as well as uncertainty associated with the OU-specific uranium K_d, the uranium PRG for the protection of groundwater is estimated using the STOMP 2D Uranium Source Model as documented in ECF-300FF5-11-0151. Groundwater protective uranium PRGs are calculated for the same two recharge scenarios as discussed above for the one-dimensional model: a native vegetation recharge scenario and an industrial recharge scenario. The groundwater protective PRGs for uranium are presented in Table 4-5.

4.4 Preliminary Remediation Goals for the Protection of Surface Water

With the exception of uranium, PRGs for the protection of surface water at and near the 300 Area Source OU have been derived using the following models:

- STOMP 1D 70:30/100:0 Contaminant Source Model, native vegetation recharge scenario
- STOMP 1D 70:30/100:0 Contaminant Source Model, industrial recharge scenario

The STOMP 1D 70:30/100:0 Contaminant Source Model assumes that either the upper 70 percent of the vadose zone (for $K_d \geq 2$ mL/g analytes) or the entire vadose zone (for $K_d < 2$ mL/g analytes) is contaminated below clean fill. The recharge rate for the native vegetation recharge scenario represents a site with native vegetation (shrub steppe) land cover. The recharge rate for the industrial recharge scenario represents a site with permanently disturbed soil with cheat grass vegetation cover. The model takes no credit for dilution of groundwater by mixing with surface water. OU-specific PRGs protective of surface water for the 300 Area Source OU calculated using the STOMP 1D 70:30/100:0 Contaminant Source Model are documented in ECF300FF5-11-0153. The STOMP 1D 70:30/100:0 surface water protective PRGs are presented in Table 4-6.

4.5 Uranium Preliminary Remediation Goal for the Protection of Surface Water

Due to the geochemical complexity of uranium in 300 Area Source OU soils, as well as uncertainty associated with the OU-specific uranium K_d, the uranium PRG for the protection of surface water is estimated using the STOMP 2D Uranium Source Model as documented in ECF-F300FF5-11-0151. Surface water protective uranium PRGs are calculated for the same two recharge scenarios as discussed above for the one-dimensional model: a native vegetation recharge scenario and an industrial recharge scenario. The surface water protective PRGs for uranium are presented in Table 4-7.

4.6 Exposure Point Concentrations

OSWER 9285.6-10, *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites*, states that, "an exposure point concentration (EPC) is a conservative estimate of the average chemical concentration in an exposure medium." OSWER Publication 9285.7-081, *Supplemental Guidance to RAGS: Calculating the Concentration Term,* states that, "because of the uncertainty associated with estimating the true average concentration at a site, the 95 percent upper confidence limit (UCL) of the arithmetic mean should be used for this variable."

The EPCs used for comparison to PRGs are the analyte-specific values computed from the post-remediation soil sample results for each waste site decision unit in the 300 Area Source OU, as described in ECF-300NPL-11-0137, *Computation of Exposure Point Concentrations for the 300-FF-2 Source Operable Unit.* The EPCs corresponding to the identified COPCs for each waste site decision unit in the 300 Area Source OU are presented in Tables 4-2 and 4-3.

5 Software Applications

Microsoft Excel® was used to tabulate the data in electronic spreadsheets. These spreadsheets are provided as tables in this environmental calculation.

® Microsoft Excel is a registered product of the Microsoft Corporation.

6 Calculation

Comparison of EPCs to PRGs is conducted as described in Section 3 to determine which COPCs exceed a PRG. Results of the comparisons are presented in the accompanying tables, as discussed in Section 7. The tables share a similar format, providing both the values being compared as well as a "Yes/No" column indicating the outcome of the comparison.

7 Results/Conclusions

A summary of the 300 Area Source OU waste site decision unit COPCs (other than uranium) with EPCs that exceed PRGs protective of groundwater is presented in Table 7-1. A summary of the 300 Area Source OU waste site decision units with uranium EPCs that exceed PRGs protective of groundwater is presented in Table 7-2. A summary of the 300 Area Source OU waste site decision unit COPCs (other than uranium) with EPCs that exceed PRGs protective of surface water is presented in Table 7-3. No comparison of 300 Area Source OU uranium EPCs to PRGs protective of surface water is necessary because no uranium EPC values exceeded the surface water protective uranium soil screening level (ECF-300NPL-11-0154).

8 References

DOE/RL-2010-99, 2012, *Remedial Investigation/Feasibility Study for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

ECF-300NPL-11-0137, 2012, *Computation of Exposure Point Concentrations for the 300-FF-2 Source Operable Unit*, Rev. 0, CH2M HILL Plateau Remediation Company, Richland, Washington.

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PNNL-15782, 2006, *STOMP Subsurface Transport Over Multiple Phases, Version 4.0: User's Guide*, Pacific Northwest National Laboratory, Richland, Washington. Available at: http://stomp.pnnl.gov/.

Table 4-2. Summary of Groundwater Protective Soil Screening Levels for the 300 Area Source Operable Unit

Analyte	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection (pCi/g, µg/kg)[c]
Radionuclides				
Americium-241	14596-10-2	200	1.0	--[d]
Cesium-137	10045-97-3	50	0.10	--[d]
Cobalt-60	10198-40-0	50	0.050	--[d]
Europium-155	14391-16-3	200	0.10	--[d]
Plutonium-238	13981-16-3	200	1.0	--[d]
Plutonium-239/240	PU-239/240	200	1.0	--[d]
Plutonium-241	14119-32-5	200	1.0	--[d]
Total beta radiostrontium	SR-RAD	25	--	227,428
Tritium	10028-17-8	0	--	9,176
Uranium-233/234	U-233/234	2.0	1.0	--[e]
Uranium-235	15117-96-1	2.0	0.50	--[e]
Uranium-238	U-238	2.0	1.0	--[e]
Nonradionuclides				
1,1,2,2-Tetrachloroethane	79-34-5	0.079	0.0050	270
1,2,4-Trichlorobenzene	120-82-1	1.7	0.33	28,655
1,4-Dichlorobenzene	106-46-7	0.62	0.0050	61,744
2,4-Dinitrotoluene	121-14-2	0.096	0.33	402
2-Butanone	78-93-3	0.0045	0.010	1.67E+06
2-Butoxyethanol	111-76-2	0.0010	--	251,308
2-Chlorophenol	95-57-8	0.39	0.33	194,372
2-Methylnaphthalene	91-57-6	3.0	0.33	1.07E+06
4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	86	0.0033	--[d]
4-Chloro-3-methylphenol	59-50-7	0.49	0.33	9.78E+06
Acenaphthene	83-32-9	6.1	0.10	7.38E+07
Acetone	67-64-1	6.00E-04	0.020	2.23E+06
Aldrin	309-00-2	49	0.0017	7,793
Alpha-BHC	319-84-6	1.8	0.0017	285
Aluminum	7429-90-5	1,500	5.0	--[d]
Anthracene	120-12-7	24	0.050	--[d]
Antimony	7440-36-0	3.8	0.60	270,034
Aroclor-1016	12674-11-2	107	0.017	--[d]
Aroclor-1221	11104-28-2	10	0.017	5,773
Aroclor-1232	11141-16-5	10	0.017	5,773
Aroclor-1242	53469-21-9	45	0.017	97,738
Aroclor-1248	12672-29-6	44	0.017	91,112
Aroclor-1254	11097-69-1	76	0.017	--[d]
Aroclor-1260	11096-82-5	822	0.017	--[d]
Arsenic	7440-38-2	29	1.0	37,999
Barium	7440-39-3	25	0.50	--[d]
Benzo(a)anthracene	56-55-3	360	0.015	--[d]
Benzo(a)pyrene	50-32-8	5,500	0.015	--[d]
Benzo(b)fluoranthene	205-99-2	803	0.015	--[d]
Benzo(k)fluoranthene	207-08-9	1,230	0.015	--[d]
Beryllium	7440-41-7	790	0.20	--[d]
Bis(2-ethylhexyl) phthalate	117-81-7	110	0.33	--[d]
Boron	7440-42-8	3.0	2.0	1.08E+08
Butylbenzylphthalate	85-68-7	14	0.33	8.41E+06
Cadmium	7440-43-9	30	0.20	3.52E+06
Chlordane	57-74-9	51	0.017	--[d]
Chloroform	67-66-3	0.053	0.0050	1,289
Chromium	7440-47-3	200	0.20	--[d]
Chrysene	218-01-9	200	0.10	--[d]
Cobalt	7440-48-4	50	2.0	--[d]
Copper	7440-50-8	22	1.0	2.41E+08
Dibenz[a,h]anthracene	53-70-3	1,790	0.030	--[d]
Dibenzofuran	132-64-9	11	0.33	2.32E+06
Dieldrin	60-57-1	26	0.0033	2,733

Table 4-2. Summary of Groundwater Protective Soil Screening Levels for the 300 Area Source Operable Unit

Analyte	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection (pCi/g, µg/kg)[c]
Diethyl ether	60-29-7	0.0097	--	664,052
Di-n-butylphthalate	84-74-2	1.6	0.33	2.85E+07
Endosulfan I	959-98-8	2.0	0.0017	2.46E+06
Endosulfan II	33213-65-9	2.0	0.0033	2.46E+06
Fluoranthene	206-44-0	49	0.050	--[d]
Fluorene	86-73-7	7.7	0.030	6.17E+07
Fluoride	16984-48-8	150	5.0	--[d]
Heptachlor epoxide	1024-57-3	83	0.0017	--[d]
Hexachlorobutadiene	87-68-3	54	0.33	--[d]
Hexachloroethane	67-72-1	1.8	0.33	65,103
Hexavalent Chromium	18540-29-9	0.80	--	6,000[f]
Indeno(1,2,3-cd)pyrene	193-39-5	3,470	0.030	--[d]
Iron	7439-89-6	25	5.0	1.43E+08
Lead	7439-92-1	30	0.50	1.06E+07
Lithium	7439-93-2	50	2.5	--[d]
Manganese	7439-96-5	50	5.0	--[d]
Mercury	7439-97-6	30	--	1.41E+06
Methoxychlor	72-43-5	80	0.017	--[d]
Methylene chloride	75-09-2	0.010	0.0050	2,098
Molybdenum	7439-98-7	20	2.0	2.58E+07
Naphthalene	91-20-3	1.2	0.10	2.26E+06
Nickel	7440-02-0	65	4.0	--[d]
Nitrate	14797-55-8	0	2.5	1.36E+07
Nitrogen in Nitrite and Nitrate	NO2+NO3-N	0	--	3.03E+06
n-Nitrosodi-n-dipropylamine	621-64-7	0.024	0.33	330
Pentachlorophenol	87-86-5	0.59	0.33	5,346
Phenol	108-95-2	0.029	0.33	1.49E+06
Pyrene	129-00-0	68	0.050	--[d]
Selenium	7782-49-2	5.0	1.0	3.02E+06
Silver	7440-22-4	90	0.20	--[d]
Strontium	7440-24-6	25	1.0	--[d]
Tetrachloroethene	127-18-4	0.27	0.0050	275
Tin	7440-31-5	130	10	--[d]
Toluene	108-88-3	0.14	0.0050	1.15E+06
Total petroleum hydrocarbons - diesel range	TPHDIESEL	--	--	2.00E+06[g]
Total petroleum hydrocarbons - kerosene range	TPHKEROSENE	--	--	2.00E+06[g]
Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	--	--	2.00E+06[g]
Total_U_Isotopes	Total_U_Isotopes	--	--	101,630[h]
Trichloroethene	79-01-6	0.094	0.0050	690
Trichloromonofluoromethane	75-69-4	0.044	--	1.95E+06
Uranium	7440-61-1	2.0	--	101,630[h]
Vanadium	7440-62-2	1,000	2.5	--[d]
Zinc	7440-66-6	30	1.0	--[d]

Notes:

a. Distribution coefficient (Kd) values are taken preferentially from DOE/RL-96-17 (Table E-2) as described in ECF-HANFORD-12-0023. The Kd value for arsenic is taken from the Ecology CLRAC database (Ecology 2012).

b. Estimated quantitation limits (EQLs) are obtained from DOE/RL-2009-45 (Appendix A). The STOMP 1D soil screening level for all analytes defaults to the EQL when the calculated value is less than the EQL.

c. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd ≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

d. The calculated soil screening level for the analyte is considered non-representative because: (1) breakthrough is simulated within 1,000 years for some soil columns while other soil columns (a majority) show no breakthrough (breakthrough defined as concentrations below 1E-04 µg/L or activity below 1E-04 pCi/L), and/or (2) the calculated residual mass of contaminant in the pore volume is high enough to represent a substantial (and physically improbable) reduction in porosity.

Table 4-2. Summary of Groundwater Protective Soil Screening Levels for the 300 Area Source Operable Unit

Analyte	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection (pCi/g, µg/kg)[c]

e. Uranium isotopes are accounted for by converting from activity-based (pCi/g) to mass-based (µg/kg) concentrations and then summing to provide a mass-based total uranium exposure point concentration (identified as Total_U_Isotopes), as described in ECF-300NPL-11-0137.

f. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

g. The soil screening level for Total Petroleum Hydrocarbons is a default screening level obtained from WAC 173-340-900, Table 747-5, "Residual Saturation Screening Levels for TPH."

h. Due to the complex geochemistry of uranium in 300 Area source operable unit soils, uranium SSLs were derived using a site-speicific two-dimensional model as described in ECF-300FF5-11-0151.

-- = Not Applicable

DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area.*

DOE/RL-2009-45, *300 Area Remedial Investigation/Feasibility Study Sampling and Analysis Plan for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units.*

ECF-300FF5-11-0151, *Groundwater Flow and Uranium Transport Modeling in Support of the 300 Area FF-5 RI/FS Document.*

ECF-300FF5-11-0153, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for 300 Area Source Areas.*

ECF-300NPL-11-0137, *Computation of Exposure Point Concentrations for the 300-FF-2 Source Operable Unit.*

ECF-HANFORD-12-0023, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* .

Ecology, 2012, “CLARC Cleanup Levels and Risk Calculations,” Washington State Department of Ecology Web-based application available at https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx.

Table 4-3. Summary of Surface Water Protective Soil Screening Levels for the 300 Area Source Operable Unit

Analyte	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection (pCi/g, µg/kg)[c]
Radionuclides				
Americium-241	14596-10-2	200	1.0	--[d]
Cesium-137	10045-97-3	50	0.10	--[d]
Cobalt-60	10198-40-0	50	0.050	--[d]
Europium-155	14391-16-3	200	0.10	--[d]
Plutonium-238	13981-16-3	200	1.0	--[d]
Plutonium-239/240	PU-239/240	200	1.0	--[d]
Plutonium-241	14119-32-5	200	1.0	--[d]
Total beta radiostrontium	SR-RAD	25	--	227,428
Tritium	10028-17-8	0	--	9,176
Uranium-233/234	U-233/234	2.0	1.0	--[e]
Uranium-235	15117-96-1	2.0	0.50	--[e]
Uranium-238	U-238	2.0	1.0	--[e]
Nonradionuclides				
1,1,2,2-Tetrachloroethane	79-34-5	0.079	0.0050	210
1,2,4-Trichlorobenzene	120-82-1	1.7	0.33	37,238
1,4-Dichlorobenzene	106-46-7	0.62	0.0050	164,520
2,4-Dinitrotoluene	121-14-2	0.096	0.33	330
2-Butanone	78-93-3	0.0045	0.010	1.71E+08
2-Butoxyethanol	111-76-2	0.0010	--	2.58E+07
2-Chlorophenol	95-57-8	0.39	0.33	393,603
2-Methylnaphthalene	91-57-6	3.0	0.33	4.65E+06
4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	86	0.0033	--[d]
4-Chloro-3-methylphenol	59-50-7	0.49	0.33	1.87E+08
Acenaphthene	83-32-9	6.1	0.10	4.94E+07
Acetone	67-64-1	6.00E-04	0.020	2.28E+08
Aldrin	309-00-2	49	0.0017	148
Alpha-BHC	319-84-6	1.8	0.0017	53
Aluminum	7429-90-5	1,500	5.0	--[d]
Anthracene	120-12-7	24	0.050	--[d]
Antimony	7440-36-0	3.8	0.60	252,032
Aroclor-1016	12674-11-2	107	0.017	--[d]
Aroclor-1221	11104-28-2	10	0.017	17
Aroclor-1232	11141-16-5	10	0.017	17
Aroclor-1242	53469-21-9	45	0.017	143
Aroclor-1248	12672-29-6	44	0.017	133
Aroclor-1254	11097-69-1	76	0.017	--[d]
Aroclor-1260	11096-82-5	822	0.017	--[d]
Arsenic	7440-38-2	29	1.0	11,726
Barium	7440-39-3	25	0.50	--[d]
Benzo(a)anthracene	56-55-3	360	0.015	--[d]
Benzo(a)pyrene	50-32-8	5,500	0.015	--[d]
Benzo(b)fluoranthene	205-99-2	803	0.015	--[d]
Benzo(k)fluoranthene	207-08-9	1,230	0.015	--[d]
Beryllium	7440-41-7	790	0.20	--[d]
Bis(2-ethylhexyl) phthalate	117-81-7	110	0.33	--[d]
Boron	7440-42-8	3.0	2.0	--[f]
Butylbenzylphthalate	85-68-7	14	0.33	1.50E+06
Cadmium	7440-43-9	30	0.20	176,066
Chlordane	57-74-9	51	0.017	--[d]
Chloroform	67-66-3	0.053	0.0050	5,207
Chromium	7440-47-3	200	0.20	--[d]
Chrysene	218-01-9	200	0.10	--[d]
Cobalt	7440-48-4	50	2.0	--[d]
Copper	7440-50-8	22	1.0	3.40E+06
Dibenz[a,h]anthracene	53-70-3	1,790	0.030	--[d]
Dibenzofuran	132-64-9	11	0.33	246,969
Dieldrin	60-57-1	26	0.0033	26

Table 4-3. Summary of Surface Water Protective Soil Screening Levels for the 300 Area Source Operable Unit

Analyte	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection (pCi/g, µg/kg)[c]
Diethyl ether	60-29-7	0.0097	--	3.98E+07
Di-n-butylphthalate	84-74-2	1.6	0.33	3.56E+07
Endosulfan I	959-98-8	2.0	0.0017	1,433
Endosulfan II	33213-65-9	2.0	0.0033	1,433
Fluoranthene	206-44-0	49	0.050	2.82E+08
Fluorene	86-73-7	7.7	0.030	1.06E+08
Fluoride	16984-48-8	150	5.0	--[d]
Heptachlor epoxide	1024-57-3	83	0.0017	--[d]
Hexachlorobutadiene	87-68-3	54	0.33	--[d]
Hexachloroethane	67-72-1	1.8	0.33	29,166
Hexavalent Chromium	18540-29-9	0.80	--	6,000[g]
Indeno(1,2,3-cd)pyrene	193-39-5	3,470	0.030	--[d]
Iron	7439-89-6	25	5.0	1.43E+08
Lead	7439-92-1	30	0.50	1.48E+06
Lithium	7439-93-2	50	2.5	--[f]
Manganese	7439-96-5	50	5.0	--[d]
Mercury	7439-97-6	30	--	8,451
Methoxychlor	72-43-5	80	0.017	--[d]
Methylene chloride	75-09-2	0.010	0.0050	1,931
Molybdenum	7439-98-7	20	2.0	--[d]
Naphthalene	91-20-3	1.2	0.10	6.97E+07
Nickel	7440-02-0	65	4.0	--[d]
Nitrate	14797-55-8	0	2.5	1.36E+07
Nitrogen in Nitrite and Nitrate	NO2+NO3-N	0	--	3.03E+06
n-Nitrosodi-n-dipropylamine	621-64-7	0.024	0.33	330
Pentachlorophenol	87-86-5	0.59	0.33	1,980
Phenol	108-95-2	0.029	0.33	6.21E+06
Pyrene	129-00-0	68	0.050	--[d]
Selenium	7782-49-2	5.0	1.0	302,457
Silver	7440-22-4	90	0.20	--[d]
Strontium	7440-24-6	25	1.0	--[d]
Tetrachloroethene	127-18-4	0.27	0.0050	1,316
Tin	7440-31-5	130	10	--[d]
Toluene	108-88-3	0.14	0.0050	2.35E+06
Total petroleum hydrocarbons - diesel range	TPHDIESEL	--	--	--[f]
Total petroleum hydrocarbons - kerosene range	TPHKEROSENE	--	--	--[f]
Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	--	--	--[f]
Total_U_Isotopes	Total_U_Isotopes	--	--	2.64E+06[h]
Trichloroethene	79-01-6	0.094	0.0050	3,511
Trichloromonofluoromethane	75-69-4	0.044	--	2.90E+07
Uranium	7440-61-1	2.0	--	2.64E+06[h]
Vanadium	7440-62-2	1,000	2.5	--[f]
Zinc	7440-66-6	30	1.0	6.41E+07

Notes:

a. Distribution coefficient (Kd) values are taken preferentially from DOE/RL-96-17 (Table E-2) as described in ECF-HANFORD-12-0023. The Kd value for arsenic is taken from the Ecology CLRAC database (Ecology 2012).

b. Estimated quantitation limits (EQLs) are obtained from DOE/RL-2009-45 (Appendix A). The STOMP 1D soil screening level for all analytes defaults to the EQL when the calculated value is less than the EQL.

c. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd ≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

d. The calculated soil screening level for the analyte is considered non-representative because: (1) breakthrough is simulated within 1,000 years for some soil columns while other soil columns (a majority) show no breakthrough (breakthrough defined as concentrations below 1E-04 µg/L or activity below 1E-04 pCi/L), and/or (2) the calculated residual mass of contaminant in the pore volume is high enough to represent a substantial (and physically improbable) reduction in porosity.

Table 4-3. Summary of Surface Water Protective Soil Screening Levels for the 300 Area Source Operable Unit

Analyte	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection (pCi/g, µg/kg)[c]

e. Uranium isotopes are accounted for by converting from activity-based (pCi/g) to mass-based (µg/kg) concentrations and then summing to provide a mass-based total uranium exposure point concentration (identified as Total_U_Isotopes), as described in ECF-300NPL-11-0137.

f. A soil screening level is not calculated because a surface water cleanup level or surface water standard is not available for the analyte.

g. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

h. Due to the complex geochemistry of uranium in 300 Area source operable unit soils, uranium SSLs were derived using a site-speicific two-dimensional model as described in ECF-300FF5-11-0151.

-- = Not Applicable

DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area.*

DOE/RL-2009-45, *300 Area Remedial Investigation/Feasibility Study Sampling and Analysis Plan for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units.*

ECF-300FF5-11-0151, *Groundwater Flow and Uranium Transport Modeling in Support of the 300 Area FF-5 RI/FS Document.*

ECF-300FF5-11-0153, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for 300 Area Source Areas.*

ECF-300NPL-11-0137, *Computation of Exposure Point Concentrations for the 300-FF-2 Source Operable Unit.*

ECF-HANFORD-12-0023, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* .

Ecology, 2012, "CLARC Cleanup Levels and Risk Calculations," Washington State Department of Ecology Web-based application available at https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx.

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
300 ASH PITS_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	52
300 ASH PITS_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,078
300 ASH PITS_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	96
300 ASH PITS_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	76
300 ASH PITS_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,450
300 ASH PITS_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.039
300 ASH PITS_Shallow	Rad	Uranium-238	U-238	pCi/g	0.82
300 VTS_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.029
300-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	13,500
300-10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	200
300-10_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	230
300-10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,078
300-10_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.16
300-10_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.041
300-10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4
300-109_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.62E+06
300-109_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	122
300-109_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	40
300-109_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,420
300-109_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	63,300
300-109_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.2
300-109_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	2.3
300-109_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	180
300-109_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	632
300-109_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	59
300-109_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,950
300-109_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	1.8
300-109_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	6,420
300-109_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,800
300-109_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	14
300-109_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.75E+07
300-109_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,890
300-109_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	278,000
300-109_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	22
300-109_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	341
300-109_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,490
300-109_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	1.6
300-109_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,108
300-109_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	47,600
300-109_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	34,700
300-109_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.4
300-109_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4
300-109_Staging Pile Area_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.78E+06
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	37
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	19
300-109_Staging Pile Area_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,580
300-109_Staging Pile Area_Focused	non-Rad	Barium	7440-39-3	µg/kg	72,700
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	2.1
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.3
300-109_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.3
300-109_Staging Pile Area_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	203
300-109_Staging Pile Area_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,060
300-109_Staging Pile Area_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	66
300-109_Staging Pile Area_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,170
300-109_Staging Pile Area_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,950
300-109_Staging Pile Area_Focused	non-Rad	Copper	7440-50-8	µg/kg	11,600
300-109_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	5.1
300-109_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	29
300-109_Staging Pile Area_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.84E+07
300-109_Staging Pile Area_Focused	non-Rad	Lead	7439-92-1	µg/kg	5,030
300-109_Staging Pile Area_Focused	non-Rad	Manganese	7439-96-5	µg/kg	286,000
300-109_Staging Pile Area_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	408
300-109_Staging Pile Area_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,570
300-109_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	µg/kg	7.0
300-109_Staging Pile Area_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,450
300-109_Staging Pile Area_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,877
300-109_Staging Pile Area_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	45,100
300-109_Staging Pile Area_Focused	non-Rad	Zinc	7440-66-6	µg/kg	48,800
300-109_Staging Pile Area_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	2.5
300-109_Staging Pile Area_Focused	Rad	Uranium-238	U-238	pCi/g	2.3
300-18_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,200
300-18_Shallow	non-Rad	Barium	7440-39-3	µg/kg	63,400
300-18_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	650
300-18_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	40
300-18_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	6,900
300-18_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,600
300-18_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,136
300-18_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.65
300-18_Shallow	Rad	Uranium-238	U-238	pCi/g	0.41
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	120,000
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	230,000

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
300-23_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	52,000
300-259_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	5.99E+06
300-259_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	322
300-259_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,096
300-259_Shallow	non-Rad	Barium	7440-39-3	µg/kg	75,232
300-259_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	226
300-259_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,303
300-259_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	252
300-259_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,901
300-259_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	5,831
300-259_Shallow	non-Rad	Copper	7440-50-8	µg/kg	10,692
300-259_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07
300-259_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,625
300-259_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	318,874
300-259_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	10
300-259_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	303
300-259_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,751
300-259_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,876
300-259_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	42,626
300-259_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	479,584
300-259_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.6
300-259_Shallow	Rad	Uranium-238	U-238	pCi/g	1.3
300-260_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.17E+06
300-260_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	922
300-260_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,160
300-260_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	122,000
300-260_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	239
300-260_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	8,360
300-260_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	110
300-260_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,890
300-260_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,430
300-260_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	73,300
300-260_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.04E+07
300-260_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	18,300
300-260_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	328,000
300-260_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	12
300-260_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	537
300-260_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,200
300-260_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	206
300-260_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,800
300-260_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	59,000
300-260_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	77,400
300-260_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.25
300-260_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	4.3
300-272_Overburden_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	13,100
300-272_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	43,100
300-275_Shallow_1	non-Rad	Acenaphthene	83-32-9	µg/kg	960
300-275_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	5.61E+06
300-275_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	260
300-275_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	2,211
300-275_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	75,261
300-275_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.3
300-275_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.9
300-275_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	452
300-275_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	1,466
300-275_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	83
300-275_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	8,022
300-275_Shallow_1	non-Rad	Chrysene	218-01-9	µg/kg	2.2
300-275_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	5,847
300-275_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	42,923
300-275_Shallow_1	non-Rad	Fluoranthene	206-44-0	µg/kg	2,300
300-275_Shallow_1	non-Rad	Fluorene	86-73-7	µg/kg	81
300-275_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	1.79E+07
300-275_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	7,189
300-275_Shallow_1	non-Rad	Lithium	7439-93-2	µg/kg	6,686
300-275_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	276,815
300-275_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	17
300-275_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	378
300-275_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	9,461
300-275_Shallow_1	non-Rad	Silver	7440-22-4	µg/kg	121
300-275_Shallow_1	non-Rad	Strontium	7440-24-6	µg/kg	20,196
300-275_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,483
300-275_Shallow_1	non-Rad	Uranium	7440-61-1	µg/kg	2,500
300-275_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	45,128
300-275_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	41,014
300-275_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.046
300-275_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	7.7
300-275_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.0
300-275_Shallow_1	Rad	Uranium-238	U-238	pCi/g	7.4
300-275_Shallow_2	non-Rad	Acenaphthene	83-32-9	µg/kg	3.6
300-275_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	6.24E+06

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
300-275_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,761
300-275_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	68,607
300-275_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	254
300-275_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	1,147
300-275_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	144
300-275_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	8,994
300-275_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	5,977
300-275_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	11,596
300-275_Shallow_2	non-Rad	Fluoranthene	206-44-0	µg/kg	56
300-275_Shallow_2	non-Rad	Fluorene	86-73-7	µg/kg	2.6
300-275_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07
300-275_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	4,099
300-275_Shallow_2	non-Rad	Lithium	7439-93-2	µg/kg	7,067
300-275_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	292,731
300-275_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	28
300-275_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	404
300-275_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	9,593
300-275_Shallow_2	non-Rad	Strontium	7440-24-6	µg/kg	27,081
300-275_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,149
300-275_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,725
300-275_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	51,632
300-275_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	41,245
300-275_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3
300-275_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	0.24
300-275_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.2
300-33, 300-41, 300-256_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.32E+06
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1016	12674-11-2	µg/kg	10
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	16
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	190
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	84
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	17
300-33, 300-41, 300-256_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,638
300-33, 300-41, 300-256_Shallow	non-Rad	Barium	7440-39-3	µg/kg	72,411
300-33, 300-41, 300-256_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	256
300-33, 300-41, 300-256_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,484
300-33, 300-41, 300-256_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	228
300-33, 300-41, 300-256_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	94
300-33, 300-41, 300-256_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	8,781
300-33, 300-41, 300-256_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,273
300-33, 300-41, 300-256_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,662
300-33, 300-41, 300-256_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	1,651
300-33, 300-41, 300-256_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.00E+07
300-33, 300-41, 300-256_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,268
300-33, 300-41, 300-256_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	5,495
300-33, 300-41, 300-256_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	314,762
300-33, 300-41, 300-256_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	16
300-33, 300-41, 300-256_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	2.9
300-33, 300-41, 300-256_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	486
300-33, 300-41, 300-256_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,880
300-33, 300-41, 300-256_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	8,617
300-33, 300-41, 300-256_Shallow	non-Rad	Silver	7440-22-4	µg/kg	782
300-33, 300-41, 300-256_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	7,260
300-33, 300-41, 300-256_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	52,694
300-33, 300-41, 300-256_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,462
300-33, 300-41, 300-256_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.1
300-33, 300-41, 300-256_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.34
300-33, 300-41, 300-256_Shallow	Rad	Uranium-238	U-238	pCi/g	2.1
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.51E+06
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	330
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	385
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,240
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	64,600
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	169
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,030
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	100
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,080
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,640
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,400
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	1,300
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.86E+07
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	3,160
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Lithium	7439-93-2	µg/kg	6,580
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	259,000
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2.2
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	275
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,040
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	17,900
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,460
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	51,400
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	38,900

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	3.0
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	2.2
300-37_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	100
300-37_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,200
300-44_Overburden_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	9,100
300-44_Overburden_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,027
300-44_Overburden_Focused	Rad	Uranium-238	U-238	pCi/g	0.35
300-44_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.71E+06
300-44_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	4,100
300-44_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	16,900
300-44_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	75,200
300-44_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	480
300-44_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,300
300-44_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,200
300-44_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	7,800
300-44_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.94E+07
300-44_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	303,000
300-44_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,600
300-44_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	872
300-44_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	43,200
300-44_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	37,800
300-44_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.29
300-45_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	86
300-45_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	290
300-45_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,600
300-45_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.023
300-45_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.061
300-45_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2
300-49_Overburden	non-Rad	1,2,4-Trichlorobenzene	120-82-1	µg/kg	31
300-49_Overburden	non-Rad	1,4-Dichlorobenzene	106-46-7	µg/kg	29
300-49_Overburden	non-Rad	2,4-Dinitrotoluene	121-14-2	µg/kg	19
300-49_Overburden	non-Rad	2-Chlorophenol	95-57-8	µg/kg	51
300-49_Overburden	non-Rad	4-Chloro-3-methylphenol	59-50-7	µg/kg	46
300-49_Overburden	non-Rad	Acenaphthene	83-32-9	µg/kg	31
300-49_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.30E+06
300-49_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	232
300-49_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,008
300-49_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,291
300-49_Overburden	non-Rad	Barium	7440-39-3	µg/kg	76,068
300-49_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	201
300-49_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	174
300-49_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	18,106
300-49_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,127
300-49_Overburden	non-Rad	Copper	7440-50-8	µg/kg	536,000
300-49_Overburden	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	52
300-49_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.08E+07
300-49_Overburden	non-Rad	Lead	7439-92-1	µg/kg	36,964
300-49_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	316,669
300-49_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	13,035
300-49_Overburden	non-Rad	n-Nitrosodi-n-dipropylamine	621-64-7	µg/kg	40
300-49_Overburden	non-Rad	Pentachlorophenol	87-86-5	µg/kg	50
300-49_Overburden	non-Rad	Phenol	108-95-2	µg/kg	50
300-49_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	40
300-49_Overburden	non-Rad	Silver	7440-22-4	µg/kg	703
300-49_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,066
300-49_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	50,380
300-49_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	141,984
300-49_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	1.0
300-49_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.057
300-49_Overburden	Rad	Uranium-238	U-238	pCi/g	1.0
300-49_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.92E+06
300-49_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	176
300-49_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,431
300-49_Shallow	non-Rad	Barium	7440-39-3	µg/kg	89,874
300-49_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	303
300-49_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,170
300-49_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,323
300-49_Shallow	non-Rad	Copper	7440-50-8	µg/kg	14,870
300-49_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.59E+07
300-49_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,629
300-49_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	361,805
300-49_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	10,664
300-49_Shallow	non-Rad	Silver	7440-22-4	µg/kg	621
300-49_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,983
300-49_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	58,672
300-49_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	54,651
300-49_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.15
300-49_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.3
300-49_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24
300-49_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1
300-50_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.68E+06

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
300-50_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	33
300-50_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	229
300-50_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	6,897
300-50_Overburden	non-Rad	Barium	7440-39-3	µg/kg	117,742
300-50_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	325
300-50_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	563
300-50_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	12,197
300-50_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	9,389
300-50_Overburden	non-Rad	Copper	7440-50-8	µg/kg	64,527
300-50_Overburden	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07
300-50_Overburden	non-Rad	Lead	7439-92-1	µg/kg	5,905
300-50_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	314,271
300-50_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	15,229
300-50_Overburden	non-Rad	Silver	7440-22-4	µg/kg	1,202
300-50_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	17,919
300-50_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	45,243
300-50_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	45,889
300-50_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.056
300-50_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	6.0
300-50_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.45
300-50_Overburden	Rad	Uranium-238	U-238	pCi/g	6.0
300-50_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.88E+06
300-50_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	3,000
300-50_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	126
300-50_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,403
300-50_Shallow	non-Rad	Barium	7440-39-3	µg/kg	103,029
300-50_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	282
300-50_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	19
300-50_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	463
300-50_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	16,841
300-50_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,109
300-50_Shallow	non-Rad	Copper	7440-50-8	µg/kg	16,820
300-50_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07
300-50_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,381
300-50_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	318,120
300-50_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,413
300-50_Shallow	non-Rad	Silver	7440-22-4	µg/kg	2,992
300-50_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	22,938
300-50_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	46,964
300-50_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,344
300-50_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.056
300-50_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	7.9
300-50_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.66
300-50_Shallow	Rad	Uranium-238	U-238	pCi/g	8.4
300-8_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	574
300-8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,374
300-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.79
300-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.82
316-1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	40,572
316-1_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.10
316-1_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.32
316-1_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	13
316-1_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	1.1
316-1_Overburden	Rad	Uranium-238	U-238	pCi/g	13
316-1_Shallow_1	non-Rad	Aroclor-1248	12672-29-6	µg/kg	3,000
316-1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	19,014
316-1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	69
316-1_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	98
316-1_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	83,027
316-1_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.032
316-1_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.2
316-1_Shallow_1	Rad	Uranium-238	U-238	pCi/g	28
316-1_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	1.11E+07
316-1_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	490
316-1_Shallow_3	non-Rad	Aroclor-1254	11097-69-1	µg/kg	98
316-1_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	5,138
316-1_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	129,106
316-1_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	416
316-1_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	342
316-1_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	474
316-1_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	50,455
316-1_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	9,703
316-1_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	1.37E+06
316-1_Shallow_3	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	3.2
316-1_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.44E+07
316-1_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	14,409
316-1_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	392,825
316-1_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	1,105
316-1_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	94,656
316-1_Shallow_3	non-Rad	Phenol	108-95-2	µg/kg	28
316-1_Shallow_3	non-Rad	Selenium	7782-49-2	µg/kg	1,444

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
316-1_Shallow_3	non-Rad	Silver	7440-22-4	µg/kg	13,196
316-1_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	63,074
316-1_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	56,707
316-1_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	82,016
316-1_Shallow_3	Rad	Cesium-137	10045-97-3	pCi/g	0.37
316-1_Shallow_3	Rad	Cobalt-60	10198-40-0	pCi/g	2.3
316-1_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	23
316-1_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	2.6
316-1_Shallow_3	Rad	Uranium-238	U-238	pCi/g	21
316-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	µg/kg	62
316-1_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	42,963
316-1_Shallow_4	Rad	Cobalt-60	10198-40-0	pCi/g	0.12
316-1_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	16
316-1_Shallow_4	Rad	Uranium-235	15117-96-1	pCi/g	1.1
316-1_Shallow_4	Rad	Uranium-238	U-238	pCi/g	14
316-2_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	210,452
316-2_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.031
316-2_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.092
316-2_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	86
316-2_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	12
316-2_Shallow_1	Rad	Uranium-238	U-238	pCi/g	69
316-2_Shallow_2	non-Rad	Aroclor-1248	12672-29-6	µg/kg	697
316-2_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	µg/kg	42
316-2_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	110
316-2_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	291,369
316-2_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	0.45
316-2_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.45
316-2_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	115
316-2_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	11
316-2_Shallow_2	Rad	Uranium-238	U-238	pCi/g	96
316-2_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	8,000
316-2_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	260
316-2_Shallow_3	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	180
316-2_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	73,174
316-2_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.91
316-2_Shallow_3	Rad	Uranium-238	U-238	pCi/g	24
316-5_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	3,070
316-5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	38
316-5_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	146
316-5_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	100
316-5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	271,835
316-5_Shallow_1	Rad	Americium-241	14596-10-2	pCi/g	0.48
316-5_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	2.3
316-5_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	19
316-5_Shallow_1	Rad	Uranium-238	U-238	pCi/g	89
316-5_Shallow_2	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	140
316-5_Shallow_2	non-Rad	2-Butoxyethanol	111-76-2	µg/kg	240
316-5_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	3,180
316-5_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	76,700
316-5_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	180
316-5_Shallow_2	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	110
316-5_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	6,900
316-5_Shallow_2	non-Rad	Chrysene	218-01-9	µg/kg	38
316-5_Shallow_2	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	146
316-5_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	3,200
316-5_Shallow_2	non-Rad	Selenium	7782-49-2	µg/kg	490
316-5_Shallow_2	non-Rad	Silver	7440-22-4	µg/kg	3,600
316-5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	204,701
316-5_Shallow_2	Rad	Americium-241	14596-10-2	pCi/g	0.12
316-5_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	1.7
316-5_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.12
316-5_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	9.0
316-5_Shallow_2	Rad	Uranium-238	U-238	pCi/g	68
316-5_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	57
316-5_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	70
316-5_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52
316-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,300
316-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	190
316-5_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	1,500
316-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	138,095
316-5_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.8
316-5_Shallow_Focused	Rad	Europium-155	14391-16-3	pCi/g	0.072
316-5_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	7.7
316-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	45
331 LSLDF_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	25
331 LSLDF_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	590
331 LSLDF_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	0.56
331 LSLDF_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	µg/kg	0.39
331 LSLDF_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.90E+06
331 LSLDF_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	360
331 LSLDF_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	850

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
331 LSLDF_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,400
331 LSLDF_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	78,600
331 LSLDF_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	570
331 LSLDF_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	910
331 LSLDF_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,700
331 LSLDF_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	340
331 LSLDF_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	140
331 LSLDF_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,300
331 LSLDF_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,600
331 LSLDF_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,400
331 LSLDF_Shallow_Focused	non-Rad	Dieldrin	60-57-1	µg/kg	13
331 LSLDF_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	98
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan I	959-98-8	µg/kg	1.9
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	µg/kg	3.1
331 LSLDF_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.20E+07
331 LSLDF_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	9,000
331 LSLDF_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	349,000
331 LSLDF_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	110
331 LSLDF_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	µg/kg	3.3
331 LSLDF_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	11
331 LSLDF_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	590
331 LSLDF_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000
331 LSLDF_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	41,700
331 LSLDF_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	9,500
331 LSLDF_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,100
331 LSLDF_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	2,300
331 LSLDF_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	53,100
331 LSLDF_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	137,000
331 LSLDF_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.54
331 LSLDF_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.47
600-243_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	µg/kg	279
600-243_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	31
600-243_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	1,300
600-243_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	27
600-243_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	18
600-243_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,159
600-243_Shallow	non-Rad	Barium	7440-39-3	µg/kg	292,072
600-243_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	43
600-243_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	43
600-243_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	46
600-243_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	32
600-243_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	2,079
600-243_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	432
600-243_Shallow	non-Rad	Boron	7440-42-8	µg/kg	294,463
600-243_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	793
600-243_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	18,006
600-243_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	63
600-243_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,207
600-243_Shallow	non-Rad	Copper	7440-50-8	µg/kg	53,981
600-243_Shallow	non-Rad	Dibenzofuran	132-64-9	µg/kg	78
600-243_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	37
600-243_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	79
600-243_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	28
600-243_Shallow	non-Rad	Lead	7439-92-1	µg/kg	40,139
600-243_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	208,289
600-243_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	1,869
600-243_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	204
600-243_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	21,395
600-243_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	70
600-243_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	5,709
600-243_Shallow	non-Rad	Silver	7440-22-4	µg/kg	500
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	95,319
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	334,524
600-243_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	46,986
600-243_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	84,099
600-259_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.034
600-259_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.068
600-259_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.038
600-47_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,300
600-47_Shallow	non-Rad	Barium	7440-39-3	µg/kg	67,000
600-47_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	500
600-47_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	90
600-47_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	5,500
600-47_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,500
600-47_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,303
600-47_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.4
600-47_Shallow	Rad	Uranium-238	U-238	pCi/g	1.6
618-1_Deep	non-Rad	Aluminum	7429-90-5	µg/kg	6.37E+06
618-1_Deep	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,760
618-1_Deep	non-Rad	Aroclor-1260	11096-82-5	µg/kg	294
618-1_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,550

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
618-1_Deep	non-Rad	Barium	7440-39-3	µg/kg	299,000
618-1_Deep	non-Rad	Beryllium	7440-41-7	µg/kg	218
618-1_Deep	non-Rad	Boron	7440-42-8	µg/kg	1,360
618-1_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	263
618-1_Deep	non-Rad	Chromium	7440-47-3	µg/kg	7,740
618-1_Deep	non-Rad	Cobalt	7440-48-4	µg/kg	8,600
618-1_Deep	non-Rad	Copper	7440-50-8	µg/kg	46,300
618-1_Deep	non-Rad	Fluoride	16984-48-8	µg/kg	2,800
618-1_Deep	non-Rad	Iron	7439-89-6	µg/kg	2.47E+07
618-1_Deep	non-Rad	Lead	7439-92-1	µg/kg	58,400
618-1_Deep	non-Rad	Lithium	7439-93-2	µg/kg	5,980
618-1_Deep	non-Rad	Manganese	7439-96-5	µg/kg	352,000
618-1_Deep	non-Rad	Mercury	7439-97-6	µg/kg	1,180
618-1_Deep	non-Rad	Molybdenum	7439-98-7	µg/kg	493
618-1_Deep	non-Rad	Nickel	7440-02-0	µg/kg	17,600
618-1_Deep	non-Rad	Nitrate	14797-55-8	µg/kg	1,700
618-1_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	220
618-1_Deep	non-Rad	Uranium	7440-61-1	µg/kg	37,400
618-1_Deep	non-Rad	Vanadium	7440-62-2	µg/kg	73,000
618-1_Deep	non-Rad	Zinc	7440-66-6	µg/kg	134,000
618-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.46
618-1_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	33
618-1_Deep	Rad	Uranium-235	15117-96-1	pCi/g	2.7
618-1_Deep	Rad	Uranium-238	U-238	pCi/g	32
618-1_Deep_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.57E+06
618-1_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	407
618-1_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1.24E+06
618-1_Deep_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	99
618-1_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,580
618-1_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	1.87E+06
618-1_Deep_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	323
618-1_Deep_Focused	non-Rad	Boron	7440-42-8	µg/kg	6,620
618-1_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,030
618-1_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	18,900
618-1_Deep_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,920
618-1_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	68,700
618-1_Deep_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	3,300
618-1_Deep_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.41E+07
618-1_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	333,000
618-1_Deep_Focused	non-Rad	Lithium	7439-93-2	µg/kg	8,450
618-1_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	351,000
618-1_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	8,940
618-1_Deep_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	2,140
618-1_Deep_Focused	non-Rad	Nickel	7440-02-0	µg/kg	13,700
618-1_Deep_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	11,900
618-1_Deep_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,560
618-1_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,290
618-1_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	209,000
618-1_Deep_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	70,900
618-1_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	82,000
618-1_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	6.5
618-1_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	70
618-1_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.5
618-1_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	65
618-1_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.21E+06
618-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	264
618-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	54
618-1_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,280
618-1_Shallow	non-Rad	Barium	7440-39-3	µg/kg	97,200
618-1_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	188
618-1_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,190
618-1_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	68
618-1_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,930
618-1_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,360
618-1_Shallow	non-Rad	Copper	7440-50-8	µg/kg	11,400
618-1_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	400
618-1_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07
618-1_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,100
618-1_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	6,380
618-1_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	300,000
618-1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	31
618-1_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	336
618-1_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,150
618-1_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	1,600
618-1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	300
618-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,224
618-1_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	56,300
618-1_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	42,100
618-1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9
618-1_Shallow	Rad	Uranium-238	U-238	pCi/g	1.5
618-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	1.22E+07

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
618-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	455
618-1_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	35
618-1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	981
618-1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	56
618-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	6,090
618-1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	102,000
618-1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	371
618-1_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	3,740
618-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	266
618-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	19,500
618-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,600
618-1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	23,800
618-1_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	900
618-1_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.28E+07
618-1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,210
618-1_Shallow_Focused	non-Rad	Lithium	7439-93-2	µg/kg	13,300
618-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	403,000
618-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	198
618-1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	356
618-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	16,800
618-1_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	3,800
618-1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	260
618-1_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,120
618-1_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	7,080
618-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	64,700
618-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	68,100
618-1_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11
618-1_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.99
618-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	8.2
618-12_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	8,557
618-12_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	63
618-12_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	60
618-12_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	32,092
618-12_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.47
618-12_Shallow	Rad	Uranium-238	U-238	pCi/g	11
618-13_Shallow	non-Rad	Acetone	67-64-1	µg/kg	8.6
618-13_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.34E+06
618-13_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	312
618-13_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,500
618-13_Shallow	non-Rad	Barium	7440-39-3	µg/kg	74,000
618-13_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	212
618-13_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,050
618-13_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	63
618-13_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,700
618-13_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,290
618-13_Shallow	non-Rad	Copper	7440-50-8	µg/kg	11,500
618-13_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.01E+07
618-13_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,620
618-13_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	344,000
618-13_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	5.1
618-13_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	420
618-13_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,400
618-13_Shallow	non-Rad	Tin	7440-31-5	µg/kg	1,050
618-13_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,750
618-13_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	55,800
618-13_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,400
618-13_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.038
618-13_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9
618-13_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7
618-13_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	5.9
618-13_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.22E+06
618-13_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	233
618-13_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,390
618-13_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	57,700
618-13_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	184
618-13_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	960
618-13_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	47
618-13_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,740
618-13_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,710
618-13_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,100
618-13_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	150
618-13_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.79E+07
618-13_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	4,940
618-13_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	268,000
618-13_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	5.0
618-13_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	297
618-13_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000
618-13_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	745
618-13_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	1,500
618-13_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	48,600
618-13_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	37,100

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
618-13_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1
618-13_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.96
618-2_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	1,500
618-2_Deep	non-Rad	Barium	7440-39-3	µg/kg	83,300
618-2_Deep	non-Rad	Chromium	7440-47-3	µg/kg	6,700
618-2_Deep	non-Rad	Lead	7439-92-1	µg/kg	6,600
618-2_Deep	non-Rad	Selenium	7782-49-2	µg/kg	780
618-2_Deep	non-Rad	Tin	7440-31-5	µg/kg	2,900
618-2_Deep	non-Rad	Uranium	7440-61-1	µg/kg	501,000
618-2_Deep	Rad	Americium-241	14596-10-2	pCi/g	7.9
618-2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	1.0
618-2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	1.5
618-2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	91
618-2_Deep	Rad	Plutonium-241	14119-32-5	pCi/g	42
618-2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	12
618-2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	161
618-2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.78
618-2_Deep	Rad	Uranium-238	U-238	pCi/g	165
618-2_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	6.9
618-2_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,300
618-2_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	109,000
618-2_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	27
618-2_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	200
618-2_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,400
618-2_Deep_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	18
618-2_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,800
618-2_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	1,200
618-2_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	600
618-2_Deep_Focused	non-Rad	Tin	7440-31-5	µg/kg	42,500
618-2_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	148,000
618-2_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	9.2
618-2_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.1
618-2_Deep_Focused	Rad	Plutonium-238	13981-16-3	pCi/g	1.6
618-2_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	92
618-2_Deep_Focused	Rad	Plutonium-241	14119-32-5	pCi/g	33
618-2_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	7.2
618-2_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	48
618-2_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	2.4
618-2_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	50
618-2_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,700
618-2_Overburden	non-Rad	Barium	7440-39-3	µg/kg	74,700
618-2_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	6,600
618-2_Overburden	non-Rad	Lead	7439-92-1	µg/kg	4,300
618-2_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	1,000
618-2_Overburden	non-Rad	Tin	7440-31-5	µg/kg	2,700
618-2_Overburden	non-Rad	Uranium	7440-61-1	µg/kg	1,140
618-2_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.058
618-2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.64
618-2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.59
618-2_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	1,900
618-2_Shallow	non-Rad	Barium	7440-39-3	µg/kg	79,100
618-2_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,100
618-2_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,600
618-2_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	760
618-2_Shallow	non-Rad	Tin	7440-31-5	µg/kg	2,400
618-2_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	4,530
618-2_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.81
618-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.2
618-2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	7.7
618-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.2
618-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.21
618-2_Shallow	Rad	Uranium-238	U-238	pCi/g	2.2
618-2_Staging Pile	non-Rad	Arsenic	7440-38-2	µg/kg	3,063
618-2_Staging Pile	non-Rad	Barium	7440-39-3	µg/kg	67,690
618-2_Staging Pile	non-Rad	Chromium	7440-47-3	µg/kg	6,424
618-2_Staging Pile	non-Rad	Lead	7439-92-1	µg/kg	4,011
618-2_Staging Pile	non-Rad	Uranium	7440-61-1	µg/kg	5,022
618-2_Staging Pile	Rad	Americium-241	14596-10-2	pCi/g	0.82
618-2_Staging Pile	Rad	Cesium-137	10045-97-3	pCi/g	0.095
618-2_Staging Pile	Rad	Plutonium-239/240	PU-239/240	pCi/g	10
618-2_Staging Pile	Rad	Tritium	10028-17-8	pCi/g	2.3
618-2_Staging Pile	Rad	Uranium-233/234	U-233/234	pCi/g	2.0
618-2_Staging Pile	Rad	Uranium-235	15117-96-1	pCi/g	0.12
618-2_Staging Pile	Rad	Uranium-238	U-238	pCi/g	2.0
618-3_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,800
618-3_Shallow	non-Rad	Barium	7440-39-3	µg/kg	76,500
618-3_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,700
618-3_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,900
618-3_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	659
618-3_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,610
618-3_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.68

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
618-3_Shallow	Rad	Uranium-238	U-238	pCi/g	0.75
618-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	238,577
618-3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	80
618-3_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.8
618-3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	79
618-4_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,200
618-4_Deep	non-Rad	Lead	7439-92-1	µg/kg	20,000
618-4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	64,506
618-4_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	20
618-4_Deep	Rad	Uranium-235	15117-96-1	pCi/g	1.1
618-4_Deep	Rad	Uranium-238	U-238	pCi/g	22
618-4_Deep_Focused	non-Rad	2-Butanone	78-93-3	µg/kg	130
618-4_Deep_Focused	non-Rad	Acetone	67-64-1	µg/kg	16
618-4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,600
618-4_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,700
618-4_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	104,000
618-4_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	4,700
618-4_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,500
618-4_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	27,700
618-4_Deep_Focused	non-Rad	Diethyl ether	60-29-7	µg/kg	1.0
618-4_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	24,900
618-4_Deep_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	40
618-4_Deep_Focused	non-Rad	Phenol	108-95-2	µg/kg	110
618-4_Deep_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	24
618-4_Deep_Focused	non-Rad	Toluene	108-88-3	µg/kg	4.8
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	34,000
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - kerosene range	TPHKEROSENE	µg/kg	42,000
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	65
618-4_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	20,777
618-4_Deep_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0
618-4_Deep_Focused	non-Rad	Trichloromonofluoromethane	75-69-4	µg/kg	12
618-4_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	7.2
618-4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.51
618-4_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	6.9
618-4_Overburden_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,500
618-4_Overburden_2	non-Rad	Lead	7439-92-1	µg/kg	4,700
618-4_Overburden_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,197
618-4_Overburden_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3
618-4_Overburden_2	Rad	Uranium-238	U-238	pCi/g	1.4
618-4_Overburden_3	non-Rad	Lead	7439-92-1	µg/kg	5,000
618-4_Overburden_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,171
618-4_Overburden_3	Rad	Uranium-233/234	U-233/234	pCi/g	0.42
618-4_Overburden_3	Rad	Uranium-235	15117-96-1	pCi/g	0.032
618-4_Overburden_3	Rad	Uranium-238	U-238	pCi/g	0.44
618-4_Overburden_4	non-Rad	Lead	7439-92-1	µg/kg	4,800
618-4_Overburden_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,323
618-4_Overburden_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.94
618-4_Overburden_4	Rad	Uranium-238	U-238	pCi/g	0.94
618-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,200
618-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	49,000
618-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	7,456
618-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	3.2
618-4_Shallow	Rad	Uranium-238	U-238	pCi/g	3.1
618-5_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	5,200
618-5_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	470
618-5_Deep	non-Rad	Chromium	7440-47-3	µg/kg	14,700
618-5_Deep	non-Rad	Lead	7439-92-1	µg/kg	82,300
618-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	26,618
618-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	8.6
618-5_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.46
618-5_Deep	Rad	Uranium-238	U-238	pCi/g	8.9
618-5_Deep_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.65E+06
618-5_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	1,800
618-5_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,500
618-5_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	106,000
618-5_Deep_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	672
618-5_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,500
618-5_Deep_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	10,500
618-5_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	21,400
618-5_Deep_Focused	non-Rad	Iron	7439-89-6	µg/kg	3.02E+07
618-5_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,600
618-5_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	579,000
618-5_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	33
618-5_Deep_Focused	non-Rad	Nickel	7440-02-0	µg/kg	11,300
618-5_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	2,270
618-5_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	36,540
618-5_Deep_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	79,500
618-5_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	65,800
618-5_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11
618-5_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.48
618-5_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	12

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
618-5_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,400
618-5_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	170
618-5_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	9,700
618-5_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,500
618-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	9,773
618-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	4.1
618-5_Overburden	Rad	Uranium-238	U-238	pCi/g	4.6
618-5_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,300
618-5_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,300
618-5_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,100
618-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,849
618-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.94
618-5_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1
618-5_Staging Pile_4	non-Rad	Arsenic	7440-38-2	µg/kg	3,300
618-5_Staging Pile_4	non-Rad	Cadmium	7440-43-9	µg/kg	50
618-5_Staging Pile_4	non-Rad	Chromium	7440-47-3	µg/kg	11,800
618-5_Staging Pile_4	non-Rad	Lead	7439-92-1	µg/kg	5,300
618-5_Staging Pile_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,364
618-5_Staging Pile_4	Rad	Uranium-233/234	U-233/234	pCi/g	1.2
618-5_Staging Pile_4	Rad	Uranium-238	U-238	pCi/g	1.1
618-5_Staging Pile_5	non-Rad	Arsenic	7440-38-2	µg/kg	2,700
618-5_Staging Pile_5	non-Rad	Chromium	7440-47-3	µg/kg	10,300
618-5_Staging Pile_5	non-Rad	Lead	7439-92-1	µg/kg	3,900
618-5_Staging Pile_5	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,326
618-5_Staging Pile_5	Rad	Uranium-233/234	U-233/234	pCi/g	1.5
618-5_Staging Pile_5	Rad	Uranium-235	15117-96-1	pCi/g	0.17
618-5_Staging Pile_5	Rad	Uranium-238	U-238	pCi/g	1.7
618-7_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	5.25E+06
618-7_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	560
618-7_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	1,891
618-7_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	68,874
618-7_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	278
618-7_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	65
618-7_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	10,227
618-7_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	9,152
618-7_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	16,120
618-7_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	2.60E+07
618-7_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	14,567
618-7_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	326,067
618-7_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	44
618-7_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	20,977
618-7_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,547
618-7_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	10,814
618-7_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	74,576
618-7_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	49,177
618-7_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.067
618-7_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	3.6
618-7_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	0.36
618-7_Shallow_1	Rad	Uranium-238	U-238	pCi/g	3.6
618-7_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	4.97E+06
618-7_Shallow_2	non-Rad	Antimony	7440-36-0	µg/kg	660
618-7_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,500
618-7_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	73,800
618-7_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	440
618-7_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	6,800
618-7_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	9,300
618-7_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	13,600
618-7_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	2.60E+07
618-7_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	2,800
618-7_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	364,000
618-7_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	20
618-7_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	9,700
618-7_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,500
618-7_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,574
618-7_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	74,700
618-7_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	46,200
618-7_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.57
618-7_Shallow_2	Rad	Uranium-238	U-238	pCi/g	0.53
618-7_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	6.74E+06
618-7_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	450
618-7_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	2,800
618-7_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	82,500
618-7_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	310
618-7_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	190
618-7_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	10,100
618-7_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	8,600
618-7_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	13,600
618-7_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.43E+07
618-7_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	4,300
618-7_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	357,000
618-7_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	20

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
618-7_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	10,100
618-7_Shallow_3	non-Rad	Tin	7440-31-5	µg/kg	1,800
618-7_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,852
618-7_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	68,200
618-7_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	44,500
618-7_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	1.1
618-7_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.085
618-7_Shallow_3	Rad	Uranium-238	U-238	pCi/g	0.95
618-7_Shallow_4	non-Rad	Aluminum	7429-90-5	µg/kg	5.65E+06
618-7_Shallow_4	non-Rad	Antimony	7440-36-0	µg/kg	250
618-7_Shallow_4	non-Rad	Arsenic	7440-38-2	µg/kg	5,200
618-7_Shallow_4	non-Rad	Barium	7440-39-3	µg/kg	57,900
618-7_Shallow_4	non-Rad	Beryllium	7440-41-7	µg/kg	220
618-7_Shallow_4	non-Rad	Cadmium	7440-43-9	µg/kg	90
618-7_Shallow_4	non-Rad	Chromium	7440-47-3	µg/kg	11,400
618-7_Shallow_4	non-Rad	Cobalt	7440-48-4	µg/kg	6,700
618-7_Shallow_4	non-Rad	Copper	7440-50-8	µg/kg	13,200
618-7_Shallow_4	non-Rad	Iron	7439-89-6	µg/kg	2.12E+07
618-7_Shallow_4	non-Rad	Lead	7439-92-1	µg/kg	3,000
618-7_Shallow_4	non-Rad	Manganese	7439-96-5	µg/kg	285,000
618-7_Shallow_4	non-Rad	Nickel	7440-02-0	µg/kg	12,900
618-7_Shallow_4	non-Rad	Tin	7440-31-5	µg/kg	710
618-7_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,064
618-7_Shallow_4	non-Rad	Vanadium	7440-62-2	µg/kg	54,800
618-7_Shallow_4	non-Rad	Zinc	7440-66-6	µg/kg	37,000
618-7_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.69
618-7_Shallow_4	Rad	Uranium-238	U-238	pCi/g	0.76
618-7_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	150
618-7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.61E+06
618-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	980
618-7_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	6.7
618-7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,200
618-7_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	92,800
618-7_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	88
618-7_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	66
618-7_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	52
618-7_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	11
618-7_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	370
618-7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	470
618-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	6,200
618-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	65,900
618-7_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	69
618-7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,000
618-7_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	25,000
618-7_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	45
618-7_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	33
618-7_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	48
618-7_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.87E+07
618-7_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,500
618-7_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	425,000
618-7_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	20
618-7_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	17,200
618-7_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	410
618-7_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,200
618-7_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	680,000
618-7_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	19,563
618-7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	80,500
618-7_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	52,400
618-7_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.010
618-7_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11
618-7_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.97
618-7_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	6.4
618-8_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,100
618-8_Shallow	non-Rad	Barium	7440-39-3	µg/kg	97,600
618-8_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	12,400
618-8_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,100
618-8_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	846
618-8_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,720
618-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.2
618-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.73
618-9_Shallow_Focused	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	110
618-9_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	680
618-9_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	390
618-9_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.57E+06
618-9_Shallow_Focused	non-Rad	Aroclor-1016	12674-11-2	µg/kg	1,900
618-9_Shallow_Focused	non-Rad	Aroclor-1221	11104-28-2	µg/kg	1,900
618-9_Shallow_Focused	non-Rad	Aroclor-1232	11141-16-5	µg/kg	1,900
618-9_Shallow_Focused	non-Rad	Aroclor-1242	53469-21-9	µg/kg	1,900
618-9_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,900
618-9_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,900
618-9_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,900

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
618-9_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	11,600
618-9_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	90,200
618-9_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	330
618-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	5,200
618-9_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	2,700
618-9_Shallow_Focused	non-Rad	Chlordane	57-74-9	µg/kg	69
618-9_Shallow_Focused	non-Rad	Chloroform	67-66-3	µg/kg	9.0
618-9_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,700
618-9_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,400
618-9_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	16,700
618-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	7,200
618-9_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	44
618-9_Shallow_Focused	non-Rad	Hexachlorobutadiene	87-68-3	µg/kg	760
618-9_Shallow_Focused	non-Rad	Hexachloroethane	67-72-1	µg/kg	17,000
618-9_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.49E+07
618-9_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	7,700
618-9_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	359,000
618-9_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	330
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300
618-9_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,600
618-9_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	1.67E+06
618-9_Shallow_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	920
618-9_Shallow_Focused	non-Rad	Toluene	108-88-3	µg/kg	9.0
618-9_Shallow_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0
618-9_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	3,100
618-9_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	59,300
618-9_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	52,300
618-9_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.071
618-9_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	3.0
628-4_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,374
628-4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	61
628-4_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,284
628-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,308
628-4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.033
628-4_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.87
628-4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.78
628-4_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	42
628-4_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,115
628-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	243
628-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	38
628-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,864
628-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	99,167
628-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,163
628-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1
628-4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.11
628-4_Shallow	Rad	Uranium-238	U-238	pCi/g	1.0
UPR-300-17_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	117
UPR-300-17_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.34E+06
UPR-300-17_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	7.0
UPR-300-17_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	359
UPR-300-17_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,970
UPR-300-17_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	450
UPR-300-17_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	113
UPR-300-17_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,573
UPR-300-17_Shallow	non-Rad	Barium	7440-39-3	µg/kg	81,014
UPR-300-17_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	59
UPR-300-17_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	44
UPR-300-17_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	33
UPR-300-17_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	9.9
UPR-300-17_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	240
UPR-300-17_Shallow	non-Rad	Boron	7440-42-8	µg/kg	3,903
UPR-300-17_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	173
UPR-300-17_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	13,795
UPR-300-17_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	39
UPR-300-17_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,688
UPR-300-17_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,135
UPR-300-17_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	35
UPR-300-17_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.9
UPR-300-17_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	5.9
UPR-300-17_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07
UPR-300-17_Shallow	non-Rad	Lead	7439-92-1	µg/kg	11,240
UPR-300-17_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	285,159
UPR-300-17_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	69
UPR-300-17_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	412
UPR-300-17_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	48
UPR-300-17_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	563,654
UPR-300-17_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	34
UPR-300-17_Shallow	non-Rad	Silver	7440-22-4	µg/kg	340
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,950
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	210,420
UPR-300-17_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,420

Table 4-4. Exposure Point Concentrations for Each Waste Site Decision Unit in the 300 Area Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
UPR-300-17_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	52,150
UPR-300-17_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	157,172
UPR-300-17_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	6.1
UPR-300-17_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.91
UPR-300-17_Shallow	Rad	Uranium-238	U-238	pCi/g	4.0
UPR-300-46_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	13
UPR-300-46_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.80E+06
UPR-300-46_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	381
UPR-300-46_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	879
UPR-300-46_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	490
UPR-300-46_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	84
UPR-300-46_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,846
UPR-300-46_Shallow	non-Rad	Barium	7440-39-3	µg/kg	82,137
UPR-300-46_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	3.9
UPR-300-46_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.4
UPR-300-46_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	5.4
UPR-300-46_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.8
UPR-300-46_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	222
UPR-300-46_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,714
UPR-300-46_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	95
UPR-300-46_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,173
UPR-300-46_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	5.6
UPR-300-46_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,361
UPR-300-46_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,151
UPR-300-46_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	1.3
UPR-300-46_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	9.6
UPR-300-46_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.2
UPR-300-46_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	7.6
UPR-300-46_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07
UPR-300-46_Shallow	non-Rad	Lead	7439-92-1	µg/kg	7,105
UPR-300-46_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	311,001
UPR-300-46_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	29
UPR-300-46_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	456
UPR-300-46_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	36
UPR-300-46_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,230
UPR-300-46_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	4.4
UPR-300-46_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,897
UPR-300-46_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	53,808
UPR-300-46_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	47,945
UPR-300-46_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.070
UPR-300-46_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.8
UPR-300-46_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24
UPR-300-46_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7

Notes:

a. ECF-300NPL-11-0137, *Computation of Exposure Point Concentrations for the 300-FF-2 Source Operable Unit.*

Table 4-5 Hanford Site Soil Background Values

Analyte Name	Analyte Class	Units	Lognormal 90th Percentile Background Value	Source of Background Values
Cesium-137	RAD	pCi/g	1.1	DOE/RL-96-12, Rev.0
Cobalt-60	RAD	pCi/g	0.0084	DOE/RL-96-12, Rev.0
Europium-154	RAD	pCi/g	0.033	DOE/RL-96-12, Rev.0
Europium-155	RAD	pCi/g	0.054	DOE/RL-96-12, Rev.0
Gross beta	RAD	pCi/g	23	DOE/RL-96-12, Rev.0
Plutonium-238	RAD	pCi/g	0.0038	DOE/RL-96-12, Rev.0
Plutonium-239/240	RAD	pCi/g	0.025	DOE/RL-96-12, Rev.0
Potassium-40	RAD	pCi/g	17	DOE/RL-96-12, Rev.0
Radium-226	RAD	pCi/g	0.82	DOE/RL-96-12, Rev.0
Radium-228	RAD	pCi/g	1.82	DOE/RL-96-12, Rev.0
Strontium-90	RAD	pCi/g	0.18	DOE/RL-96-12, Rev.0
Thorium-228	RAD	pCi/g	1.40	DOE/RL-96-12, Rev.0
Thorium-232	RAD	pCi/g	1.3	DOE/RL-96-12, Rev.0
Total beta radiostrontium	RAD	pCi/g	0.18	DOE/RL-96-12, Rev.0
Uranium-233/234	RAD	pCi/g	1.1	DOE/RL-96-12, Rev.0
Uranium-234	RAD	pCi/g	1.1	DOE/RL-96-12, Rev.0
Uranium-235	RAD	pCi/g	0.11	DOE/RL-96-12, Rev.0
Uranium-238	RAD	pCi/g	1.1	DOE/RL-96-12, Rev.0
Aluminum	METAL	µg/kg	1.18E+07	DOE/RL-92-24, V.1, Rev.4
Antimony	METAL	µg/kg	130	ECF-HANFORD-11-0038
Arsenic	METAL	µg/kg	6,470	DOE/RL-92-24, V.1, Rev.4
Barium	METAL	µg/kg	132,000	DOE/RL-92-24, V.1, Rev.4
Beryllium	METAL	µg/kg	1,510	DOE/RL-92-24, V.1, Rev.4
Cadmium	METAL	µg/kg	563	ECF-HANFORD-11-0038
Calcium	METAL	µg/kg	1.72E+07	DOE/RL-92-24, V.1, Rev.4
Chromium	METAL	µg/kg	18,500	DOE/RL-92-24, V.1, Rev.4
Cobalt	METAL	µg/kg	15,700	DOE/RL-92-24, V.1, Rev.4
Copper	METAL	µg/kg	22,000	DOE/RL-92-24, V.1, Rev.4
Iron	METAL	µg/kg	3.26E+07	DOE/RL-92-24, V.1, Rev.4
Lead	METAL	µg/kg	10,200	DOE/RL-92-24, V.1, Rev.4
Lithium	METAL	µg/kg	13300	ECF-HANFORD-11-0038
Magnesium	METAL	µg/kg	7.06E+06	DOE/RL-92-24, V.1, Rev.4
Manganese	METAL	µg/kg	512,000	DOE/RL-92-24, V.1, Rev.4
Mercury	METAL	µg/kg	13	ECF-HANFORD-11-0038
Molybdenum	METAL	µg/kg	470	ECF-HANFORD-11-0038
Nickel	METAL	µg/kg	19,100	DOE/RL-92-24, V.1, Rev.4
Potassium	METAL	µg/kg	2.15E+06	DOE/RL-92-24, V.1, Rev.4
Silver	METAL	µg/kg	167	ECF-HANFORD-11-0038
Sodium	METAL	µg/kg	690,000	DOE/RL-92-24, V.1, Rev.4
Total_U_Isotopes	METAL	µg/kg	3,210	Isotopic Activity Conversion based on DOE/RL-96-12 values
Uranium	METAL	µg/kg	3,210	Isotopic Activity Conversion based on DOE/RL-96-12 values
Vanadium	METAL	µg/kg	85,100	DOE/RL-92-24, V.1, Rev.4
Zinc	METAL	µg/kg	67,800	DOE/RL-92-24, V.1, Rev.4
Ammonia	ANIONS	µg/kg	9,230	DOE/RL-92-24, V.1, Rev.4

Table 4-5 Hanford Site Soil Background Values

Analyte Name	Analyte Class	Units	Lognormal 90th Percentile Background Value	Source of Background Values
Chloride	ANIONS	µg/kg	100,000	DOE/RL-92-24, V.1, Rev.4
Fluoride	ANIONS	µg/kg	2,810	DOE/RL-92-24, V.1, Rev.4
Nitrate	ANIONS	µg/kg	52,000	DOE/RL-92-24, V.1, Rev.4
Phosphate	ANIONS	µg/kg	785	DOE/RL-92-24, V.1, Rev.4
Sulfate	ANIONS	µg/kg	237,000	DOE/RL-92-24, V.1, Rev.4
Boron	METAL	µg/kg	3,890	ECF-HANFORD-11-0038
Selenium	METAL	µg/kg	780	ECF-HANFORD-11-0038
Thallium	METAL	µg/kg	185	ECF-HANFORD-11-0038

Notes:

DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes.*

DOE/RL-96-12, *Hanford Site Background: Part 2, Soil Background for Radionuclides.*

ECF-HANFORD-11-0038, *Soil Background Data for Interim Use at the Hanford Site.*

Table 7-1. Summary of Analytes that Exceed STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
316-2_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	210,452	101,630[b]	Yes
316-2_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	291,369	101,630[b]	Yes
316-5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	271,835	101,630[b]	Yes
316-5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	204,701	101,630[b]	Yes
316-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	138,095	101,630[b]	Yes
618-1_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	209,000	101,630[b]	Yes
618-2_Deep	non-Rad	Uranium	7440-61-1	µg/kg	501,000	101,630[b]	Yes
618-2_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	148,000	101,630[b]	Yes
618-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	238,577	101,630[b]	Yes
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	2,098	Yes
618-9_Shallow_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	920	275	Yes

Notes:

a. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd ≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

b. Due to the complex geochemistry of uranium in 300 Area source operable unit soils, uranium SSLs were derived using a site-speicific two-dimensional model as described in ECF-300FF5-11-0151.

-- = Not applicable or no value

Table 7-2. Summary of Analytes that Exceed STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	13,500	11,726	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	190	133	Yes
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	330	133	Yes
300-44_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	16,900	11,726	Yes
316-1_Shallow_1	non-Rad	Aroclor-1248	12672-29-6	µg/kg	3,000	133	Yes
316-1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	19,014	11,726	Yes
316-2_Shallow_2	non-Rad	Aroclor-1248	12672-29-6	µg/kg	697	133	Yes
618-1_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	8,940	8,451	Yes
618-9_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	390	148	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1221	11104-28-2	µg/kg	1,900	17	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1232	11141-16-5	µg/kg	1,900	17	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1242	53469-21-9	µg/kg	1,900	143	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,900	133	Yes
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	1,931	Yes
628-4_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,115	133	Yes
UPR-300-17_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,970	133	Yes
UPR-300-46_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	879	133	Yes

Notes:

a. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd ≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

-- = Not applicable or no value

Table 7-3. Summary of Analytes that Exceed STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
316-2_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	210,452	101,630[b]	Yes
316-2_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	291,369	101,630[b]	Yes
316-5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	271,835	101,630[b]	Yes
316-5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	204,701	101,630[b]	Yes
316-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	138,095	101,630[b]	Yes
618-1_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	209,000	101,630[b]	Yes
618-2_Deep	non-Rad	Uranium	7440-61-1	µg/kg	501,000	101,630[b]	Yes
618-2_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	148,000	101,630[b]	Yes
618-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	238,577	101,630[b]	Yes
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	2,098	Yes
618-9_Shallow_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	920	275	Yes

Notes:

a. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd ≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

b. Due to the complex geochemistry of uranium in 300 Area source operable unit soils, uranium SSLs were derived using a site-speicific two-dimensional model as described in ECF-300FF5-11-0151.

-- = Not applicable or no value

Table 7-4. Summary of Analytes that Exceed STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	13,500	11,726	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	190	133	Yes
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	330	133	Yes
300-44_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	16,900	11,726	Yes
316-1_Shallow_1	non-Rad	Aroclor-1248	12672-29-6	µg/kg	3,000	133	Yes
316-1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	19,014	11,726	Yes
316-2_Shallow_2	non-Rad	Aroclor-1248	12672-29-6	µg/kg	697	133	Yes
618-1_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	8,940	8,451	Yes
618-9_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	390	148	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1221	11104-28-2	µg/kg	1,900	17	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1232	11141-16-5	µg/kg	1,900	17	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1242	53469-21-9	µg/kg	1,900	143	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,900	133	Yes
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	1,931	Yes
628-4_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,115	133	Yes
UPR-300-17_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,970	133	Yes
UPR-300-46_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	879	133	Yes

Notes:

a. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd ≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

-- = Not applicable or no value

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
300 ASH PITS_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	52	91,112	No
300 ASH PITS_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,078	37,999	No
300 ASH PITS_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	96	--[b]	--
300 ASH PITS_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	76	8.41E+06	No
300 ASH PITS_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,450	101,630[c]	No
300 ASH PITS_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.039	--[d]	--
300 ASH PITS_Shallow	Rad	Uranium-238	U-238	pCi/g	0.82	--[d]	--
300 VTS_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.029	--[b]	--
300-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	13,500	37,999	No
300-10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	200	--[b]	--
300-10_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	230	8.41E+06	No
300-10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,078	101,630[c]	No
300-10_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.16	--[b]	--
300-10_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.041	--[d]	--
300-10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
300-109_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.62E+06	--[b]	--
300-109_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	122	--[b]	--
300-109_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	40	--[b]	--
300-109_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,420	37,999	No
300-109_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	63,300	--[b]	--
300-109_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.2	--[b]	--
300-109_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	2.3	--[b]	--
300-109_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	180	--[b]	--
300-109_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	632	1.08E+08	No
300-109_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	59	3.52E+06	No
300-109_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,950	--[b]	--
300-109_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	1.8	--[b]	--
300-109_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	6,420	--[b]	--
300-109_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,800	2.41E+08	No
300-109_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	14	--[b]	--
300-109_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.75E+07	1.43E+08	No
300-109_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,890	1.06E+07	No
300-109_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	278,000	--[b]	--
300-109_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	22	1.41E+06	No
300-109_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	341	2.58E+07	No
300-109_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,490	--[b]	--
300-109_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	1.6	--[b]	--
300-109_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,108	101,630[c]	No
300-109_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	47,600	--[b]	--
300-109_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	34,700	--[b]	--
300-109_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	--[d]	--
300-109_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
300-109_Staging Pile Area_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.78E+06	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	37	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	19	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,580	37,999	No
300-109_Staging Pile Area_Focused	non-Rad	Barium	7440-39-3	µg/kg	72,700	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	2.1	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.3	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.3	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	203	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,060	1.08E+08	No
300-109_Staging Pile Area_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	66	3.52E+06	No
300-109_Staging Pile Area_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,170	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,950	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Copper	7440-50-8	µg/kg	11,600	2.41E+08	No
300-109_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	5.1	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	29	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.84E+07	1.43E+08	No
300-109_Staging Pile Area_Focused	non-Rad	Lead	7439-92-1	µg/kg	5,030	1.06E+07	No
300-109_Staging Pile Area_Focused	non-Rad	Manganese	7439-96-5	µg/kg	286,000	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	408	2.58E+07	No
300-109_Staging Pile Area_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,570	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	µg/kg	7.0	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,450	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,877	101,630[c]	No
300-109_Staging Pile Area_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	45,100	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Zinc	7440-66-6	µg/kg	48,800	--[b]	--
300-109_Staging Pile Area_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	2.5	--[d]	--
300-109_Staging Pile Area_Focused	Rad	Uranium-238	U-238	pCi/g	2.3	--[d]	--
300-18_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,200	37,999	No
300-18_Shallow	non-Rad	Barium	7440-39-3	µg/kg	63,400	--[b]	--
300-18_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	650	--[b]	--
300-18_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	40	3.52E+06	No
300-18_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	6,900	--[b]	--
300-18_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,600	1.06E+07	No
300-18_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,136	101,630[c]	No
300-18_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.65	--[d]	--
300-18_Shallow	Rad	Uranium-238	U-238	pCi/g	0.41	--[d]	--
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	120,000	2.00E+06[e]	No
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	230,000	2.00E+06[e]	No
300-23_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	52,000	2.00E+06[e]	No
300-259_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	5.99E+06	--[b]	--

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
300-259_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	322	270,034	No
300-259_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,096	37,999	No
300-259_Shallow	non-Rad	Barium	7440-39-3	µg/kg	75,232	--[b]	--
300-259_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	226	--[b]	--
300-259_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,303	1.08E+08	No
300-259_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	252	3.52E+06	No
300-259_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,901	--[b]	--
300-259_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	5,831	--[b]	--
300-259_Shallow	non-Rad	Copper	7440-50-8	µg/kg	10,692	2.41E+08	No
300-259_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	1.43E+08	No
300-259_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,625	1.06E+07	No
300-259_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	318,874	--[b]	--
300-259_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	10	1.41E+06	No
300-259_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	303	2.58E+07	No
300-259_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,751	--[b]	--
300-259_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,876	101,630[c]	No
300-259_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	42,626	--[b]	--
300-259_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	479,584	--[b]	--
300-259_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.6	--[d]	--
300-259_Shallow	Rad	Uranium-238	U-238	pCi/g	1.3	--[d]	--
300-260_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.17E+06	--[b]	--
300-260_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	922	270,034	No
300-260_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,160	37,999	No
300-260_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	122,000	--[b]	--
300-260_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	239	--[b]	--
300-260_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	8,360	1.08E+08	No
300-260_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	110	3.52E+06	No
300-260_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,890	--[b]	--
300-260_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,430	--[b]	--
300-260_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	73,300	2.41E+08	No
300-260_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.04E+07	1.43E+08	No
300-260_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	18,300	1.06E+07	No
300-260_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	328,000	--[b]	--
300-260_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	12	1.41E+06	No
300-260_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	537	2.58E+07	No
300-260_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,200	--[b]	--
300-260_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	206	--[b]	--
300-260_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,800	101,630[c]	No
300-260_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	59,000	--[b]	--
300-260_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	77,400	--[b]	--
300-260_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.25	--[d]	--
300-260_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	4.3	--[d]	--
300-272_Overburden_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	13,100	2.00E+06[e]	No
300-272_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	43,100	2.00E+06[e]	No
300-275_Shallow_1	non-Rad	Acenaphthene	83-32-9	µg/kg	960	7.38E+07	No
300-275_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	5.61E+06	--[b]	--
300-275_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	260	270,034	No
300-275_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	2,211	37,999	No
300-275_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	75,261	--[b]	--
300-275_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.3	--[b]	--
300-275_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.9	--[b]	--
300-275_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	452	--[b]	--
300-275_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	1,466	1.08E+08	No
300-275_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	83	3.52E+06	No
300-275_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	8,022	--[b]	--
300-275_Shallow_1	non-Rad	Chrysene	218-01-9	µg/kg	2.2	--[b]	--
300-275_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	5,847	--[b]	--
300-275_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	42,923	2.41E+08	No
300-275_Shallow_1	non-Rad	Fluoranthene	206-44-0	µg/kg	2,300	--[b]	--
300-275_Shallow_1	non-Rad	Fluorene	86-73-7	µg/kg	81	6.17E+07	No
300-275_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	1.79E+07	1.43E+08	No
300-275_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	7,189	1.06E+07	No
300-275_Shallow_1	non-Rad	Lithium	7439-93-2	µg/kg	6,686	--[b]	--
300-275_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	276,815	--[b]	--
300-275_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	17	1.41E+06	No
300-275_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	378	2.58E+07	No
300-275_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	9,461	--[b]	--
300-275_Shallow_1	non-Rad	Silver	7440-22-4	µg/kg	121	--[b]	--
300-275_Shallow_1	non-Rad	Strontium	7440-24-6	µg/kg	20,196	--[b]	--
300-275_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,483	--[b]	--
300-275_Shallow_1	non-Rad	Uranium	7440-61-1	µg/kg	2,500	101,630[c]	No
300-275_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	45,128	--[b]	--
300-275_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	41,014	--[b]	--
300-275_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.046	--[b]	--
300-275_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	7.7	--[d]	--
300-275_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.0	--[d]	--
300-275_Shallow_1	Rad	Uranium-238	U-238	pCi/g	7.4	--[d]	--
300-275_Shallow_2	non-Rad	Acenaphthene	83-32-9	µg/kg	3.6	7.38E+07	No
300-275_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	6.24E+06	--[b]	--
300-275_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,761	37,999	No
300-275_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	68,607	--[b]	--
300-275_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	254	--[b]	--
300-275_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	1,147	1.08E+08	No
300-275_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	144	3.52E+06	No

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
300-275_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	8,994	--[b]	--
300-275_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	5,977	--[b]	--
300-275_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	11,596	2.41E+08	No
300-275_Shallow_2	non-Rad	Fluoranthene	206-44-0	µg/kg	56	--[b]	--
300-275_Shallow_2	non-Rad	Fluorene	86-73-7	µg/kg	2.6	6.17E+07	No
300-275_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	1.43E+08	No
300-275_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	4,099	1.06E+07	No
300-275_Shallow_2	non-Rad	Lithium	7439-93-2	µg/kg	7,067	--[b]	--
300-275_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	292,731	--[b]	--
300-275_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	28	1.41E+06	No
300-275_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	404	2.58E+07	No
300-275_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	9,593	--[b]	--
300-275_Shallow_2	non-Rad	Strontium	7440-24-6	µg/kg	27,081	--[b]	--
300-275_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,149	--[b]	--
300-275_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,725	101,630[c]	No
300-275_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	51,632	--[b]	--
300-275_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	41,245	--[b]	--
300-275_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
300-275_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
300-275_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.2	--[d]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.32E+06	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1016	12674-11-2	µg/kg	10	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	16	97,738	No
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	190	91,112	No
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	84	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	17	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,638	37,999	No
300-33, 300-41, 300-256_Shallow	non-Rad	Barium	7440-39-3	µg/kg	72,411	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	256	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,484	1.08E+08	No
300-33, 300-41, 300-256_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	228	8.41E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	94	3.52E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	8,781	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,273	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,662	2.41E+08	No
300-33, 300-41, 300-256_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	1,651	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.00E+07	1.43E+08	No
300-33, 300-41, 300-256_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,268	1.06E+07	No
300-33, 300-41, 300-256_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	5,495	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	314,762	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	16	1.41E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	2.9	2,098	No
300-33, 300-41, 300-256_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	486	2.58E+07	No
300-33, 300-41, 300-256_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,880	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	8,617	1.36E+07	No
300-33, 300-41, 300-256_Shallow	non-Rad	Silver	7440-22-4	µg/kg	782	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	7,260	101,630[c]	No
300-33, 300-41, 300-256_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	52,694	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,462	--[b]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.1	--[d]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.34	--[d]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-238	U-238	pCi/g	2.1	--[d]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.51E+06	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	330	91,112	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	385	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,240	37,999	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	64,600	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	169	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,030	1.08E+08	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	100	3.52E+06	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,080	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,640	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,400	2.41E+08	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	1,300	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.86E+07	1.43E+08	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	3,160	1.06E+07	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Lithium	7439-93-2	µg/kg	6,580	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	259,000	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2.2	2,098	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	275	2.58E+07	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,040	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	17,900	1.36E+07	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,460	101,630[c]	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	51,400	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	38,900	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	3.0	--[d]	--
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	2.2	--[d]	--
300-37_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	100	--[b]	--
300-37_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,200	--[b]	--
300-44_Overburden_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	9,100	37,999	No
300-44_Overburden_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,027	101,630[c]	No
300-44_Overburden_Focused	Rad	Uranium-238	U-238	pCi/g	0.35	--[d]	--
300-44_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.71E+06	--[b]	--

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
300-44_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	4,100	270,034	No
300-44_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	16,900	37,999	No
300-44_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	75,200	--[b]	--
300-44_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	480	--[b]	--
300-44_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,300	--[b]	--
300-44_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,200	--[b]	--
300-44_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	7,800	2.41E+08	No
300-44_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.94E+07	1.43E+08	No
300-44_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	303,000	--[b]	--
300-44_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,600	--[b]	--
300-44_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	872	101,630[c]	No
300-44_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	43,200	--[b]	--
300-44_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	37,800	--[b]	--
300-44_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.29	--[d]	--
300-45_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	86	--[b]	--
300-45_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	290	--[b]	--
300-45_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,600	101,630[c]	No
300-45_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.023	--[b]	--
300-45_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.061	--[d]	--
300-45_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2	--[d]	--
300-49_Overburden	non-Rad	1,2,4-Trichlorobenzene	120-82-1	µg/kg	31	28,655	No
300-49_Overburden	non-Rad	1,4-Dichlorobenzene	106-46-7	µg/kg	29	61,744	No
300-49_Overburden	non-Rad	2,4-Dinitrotoluene	121-14-2	µg/kg	19	402	No
300-49_Overburden	non-Rad	2-Chlorophenol	95-57-8	µg/kg	51	194,372	No
300-49_Overburden	non-Rad	4-Chloro-3-methylphenol	59-50-7	µg/kg	46	9.78E+06	No
300-49_Overburden	non-Rad	Acenaphthene	83-32-9	µg/kg	31	7.38E+07	No
300-49_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.30E+06	--[b]	--
300-49_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	232	270,034	No
300-49_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,008	--[b]	--
300-49_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,291	37,999	No
300-49_Overburden	non-Rad	Barium	7440-39-3	µg/kg	76,068	--[b]	--
300-49_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	201	--[b]	--
300-49_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	174	3.52E+06	No
300-49_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	18,106	--[b]	--
300-49_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,127	--[b]	--
300-49_Overburden	non-Rad	Copper	7440-50-8	µg/kg	536,000	2.41E+08	No
300-49_Overburden	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	52	2.85E+07	No
300-49_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.08E+07	1.43E+08	No
300-49_Overburden	non-Rad	Lead	7439-92-1	µg/kg	36,964	1.06E+07	No
300-49_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	316,669	--[b]	--
300-49_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	13,035	--[b]	--
300-49_Overburden	non-Rad	n-Nitrosodi-n-dipropylamine	621-64-7	µg/kg	40	330	No
300-49_Overburden	non-Rad	Pentachlorophenol	87-86-5	µg/kg	50	5,346	No
300-49_Overburden	non-Rad	Phenol	108-95-2	µg/kg	50	1.49E+06	No
300-49_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	40	--[b]	--
300-49_Overburden	non-Rad	Silver	7440-22-4	µg/kg	703	--[b]	--
300-49_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,066	101,630[c]	No
300-49_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	50,380	--[b]	--
300-49_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	141,984	--[b]	--
300-49_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	1.0	--[d]	--
300-49_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.057	--[d]	--
300-49_Overburden	Rad	Uranium-238	U-238	pCi/g	1.0	--[d]	--
300-49_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.92E+06	--[b]	--
300-49_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	176	270,034	No
300-49_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,431	37,999	No
300-49_Shallow	non-Rad	Barium	7440-39-3	µg/kg	89,874	--[b]	--
300-49_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	303	--[b]	--
300-49_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,170	--[b]	--
300-49_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,323	--[b]	--
300-49_Shallow	non-Rad	Copper	7440-50-8	µg/kg	14,870	2.41E+08	No
300-49_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.59E+07	1.43E+08	No
300-49_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,629	1.06E+07	No
300-49_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	361,805	--[b]	--
300-49_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	10,664	--[b]	--
300-49_Shallow	non-Rad	Silver	7440-22-4	µg/kg	621	--[b]	--
300-49_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,983	101,630[c]	No
300-49_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	58,672	--[b]	--
300-49_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	54,651	--[b]	--
300-49_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.15	--[b]	--
300-49_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
300-49_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
300-49_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
300-50_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.68E+06	--[b]	--
300-50_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	33	--[b]	--
300-50_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	229	--[b]	--
300-50_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	6,897	37,999	No
300-50_Overburden	non-Rad	Barium	7440-39-3	µg/kg	117,742	--[b]	--
300-50_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	325	--[b]	--
300-50_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	563	3.52E+06	No
300-50_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	12,197	--[b]	--
300-50_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	9,389	--[b]	--
300-50_Overburden	non-Rad	Copper	7440-50-8	µg/kg	64,527	2.41E+08	No
300-50_Overburden	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07	1.43E+08	No
300-50_Overburden	non-Rad	Lead	7439-92-1	µg/kg	5,905	1.06E+07	No

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
300-50_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	314,271	--[b]	--
300-50_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	15,229	--[b]	--
300-50_Overburden	non-Rad	Silver	7440-22-4	µg/kg	1,202	--[b]	--
300-50_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	17,919	101,630[c]	No
300-50_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	45,243	--[b]	--
300-50_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	45,889	--[b]	--
300-50_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.056	--[b]	--
300-50_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	6.0	--[d]	--
300-50_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.45	--[d]	--
300-50_Overburden	Rad	Uranium-238	U-238	pCi/g	6.0	--[d]	--
300-50_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.88E+06	--[b]	--
300-50_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	3,000	270,034	No
300-50_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	126	--[b]	--
300-50_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,403	37,999	No
300-50_Shallow	non-Rad	Barium	7440-39-3	µg/kg	103,029	--[b]	--
300-50_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	282	--[b]	--
300-50_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	19	--[b]	--
300-50_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	463	3.52E+06	No
300-50_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	16,841	--[b]	--
300-50_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,109	--[b]	--
300-50_Shallow	non-Rad	Copper	7440-50-8	µg/kg	16,820	2.41E+08	No
300-50_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	1.43E+08	No
300-50_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,381	1.06E+07	No
300-50_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	318,120	--[b]	--
300-50_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,413	--[b]	--
300-50_Shallow	non-Rad	Silver	7440-22-4	µg/kg	2,992	--[b]	--
300-50_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	22,938	101,630[c]	No
300-50_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	46,964	--[b]	--
300-50_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,344	--[b]	--
300-50_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.056	--[b]	--
300-50_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	7.9	--[d]	--
300-50_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.66	--[d]	--
300-50_Shallow	Rad	Uranium-238	U-238	pCi/g	8.4	--[d]	--
300-8_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	574	--[b]	--
300-8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,374	101,630[c]	No
300-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.79	--[d]	--
300-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.82	--[d]	--
316-1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	40,572	101,630[c]	No
316-1_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.10	--[b]	--
316-1_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.32	--[b]	--
316-1_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	13	--[d]	--
316-1_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
316-1_Overburden	Rad	Uranium-238	U-238	pCi/g	13	--[d]	--
316-1_Shallow_1	non-Rad	Aroclor-1248	12672-29-6	µg/kg	3,000	91,112	No
316-1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	19,014	37,999	No
316-1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	69	--[b]	--
316-1_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	98	8.41E+06	No
316-1_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	83,027	101,630[c]	No
316-1_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.032	--[b]	--
316-1_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.2	--[d]	--
316-1_Shallow_1	Rad	Uranium-238	U-238	pCi/g	28	--[d]	--
316-1_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	1.11E+07	--[b]	--
316-1_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	490	270,034	No
316-1_Shallow_3	non-Rad	Aroclor-1254	11097-69-1	µg/kg	98	--[b]	--
316-1_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	5,138	37,999	No
316-1_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	129,106	--[b]	--
316-1_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	416	--[b]	--
316-1_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	342	--[b]	--
316-1_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	474	3.52E+06	No
316-1_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	50,455	--[b]	--
316-1_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	9,703	--[b]	--
316-1_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	1.37E+06	2.41E+08	No
316-1_Shallow_3	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	3.2	--[b]	--
316-1_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.44E+07	1.43E+08	No
316-1_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	14,409	1.06E+07	No
316-1_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	392,825	--[b]	--
316-1_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	1,105	1.41E+06	No
316-1_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	94,656	--[b]	--
316-1_Shallow_3	non-Rad	Phenol	108-95-2	µg/kg	28	1.49E+06	No
316-1_Shallow_3	non-Rad	Selenium	7782-49-2	µg/kg	1,444	3.02E+06	No
316-1_Shallow_3	non-Rad	Silver	7440-22-4	µg/kg	13,196	--[b]	--
316-1_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	63,074	101,630[c]	No
316-1_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	56,707	--[b]	--
316-1_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	82,016	--[b]	--
316-1_Shallow_3	Rad	Cesium-137	10045-97-3	pCi/g	0.37	--[b]	--
316-1_Shallow_3	Rad	Cobalt-60	10198-40-0	pCi/g	2.3	--[b]	--
316-1_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	23	--[d]	--
316-1_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	2.6	--[d]	--
316-1_Shallow_3	Rad	Uranium-238	U-238	pCi/g	21	--[d]	--
316-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	µg/kg	62	--[b]	--
316-1_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	42,963	101,630[c]	No
316-1_Shallow_4	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
316-1_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	16	--[d]	--
316-1_Shallow_4	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
316-1_Shallow_4	Rad	Uranium-238	U-238	pCi/g	14	--[d]	--
316-2_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	210,452	101,630[c]	Yes
316-2_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.031	--[b]	--
316-2_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.092	--[b]	--
316-2_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	86	--[d]	--
316-2_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	12	--[d]	--
316-2_Shallow_1	Rad	Uranium-238	U-238	pCi/g	69	--[d]	--
316-2_Shallow_2	non-Rad	Aroclor-1248	12672-29-6	µg/kg	697	91,112	No
316-2_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	µg/kg	42	--[b]	--
316-2_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	110	--[b]	--
316-2_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	291,369	101,630[c]	Yes
316-2_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	0.45	--[b]	--
316-2_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.45	--[b]	--
316-2_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	115	--[d]	--
316-2_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	11	--[d]	--
316-2_Shallow_2	Rad	Uranium-238	U-238	pCi/g	96	--[d]	--
316-2_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	8,000	37,999	No
316-2_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	260	--[b]	--
316-2_Shallow_3	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	180	8.41E+06	No
316-2_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	73,174	101,630[c]	No
316-2_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.91	--[d]	--
316-2_Shallow_3	Rad	Uranium-238	U-238	pCi/g	24	--[d]	--
316-5_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	3,070	37,999	No
316-5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	38	--[b]	--
316-5_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	146	--[b]	--
316-5_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	100	8.41E+06	No
316-5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	271,835	101,630[c]	Yes
316-5_Shallow_1	Rad	Americium-241	14596-10-2	pCi/g	0.48	--[b]	--
316-5_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	2.3	--[b]	--
316-5_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	19	--[d]	--
316-5_Shallow_1	Rad	Uranium-238	U-238	pCi/g	89	--[d]	--
316-5_Shallow_2	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	140	270	No
316-5_Shallow_2	non-Rad	2-Butoxyethanol	111-76-2	µg/kg	240	251,308	No
316-5_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	3,180	37,999	No
316-5_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	76,700	--[b]	--
316-5_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	180	--[b]	--
316-5_Shallow_2	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	110	8.41E+06	No
316-5_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	6,900	--[b]	--
316-5_Shallow_2	non-Rad	Chrysene	218-01-9	µg/kg	38	--[b]	--
316-5_Shallow_2	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	146	2.85E+07	No
316-5_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	3,200	1.06E+07	No
316-5_Shallow_2	non-Rad	Selenium	7782-49-2	µg/kg	490	3.02E+06	No
316-5_Shallow_2	non-Rad	Silver	7440-22-4	µg/kg	3,600	--[b]	--
316-5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	204,701	101,630[c]	Yes
316-5_Shallow_2	Rad	Americium-241	14596-10-2	pCi/g	0.12	--[b]	--
316-5_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	1.7	--[b]	--
316-5_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--
316-5_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	9.0	--[d]	--
316-5_Shallow_2	Rad	Uranium-238	U-238	pCi/g	68	--[d]	--
316-5_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	57	91,112	No
316-5_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	70	--[b]	--
316-5_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--[b]	--
316-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,300	37,999	No
316-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	190	--[b]	--
316-5_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	1,500	2.85E+07	No
316-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	138,095	101,630[c]	Yes
316-5_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.8	--[b]	--
316-5_Shallow_Focused	Rad	Europium-155	14391-16-3	pCi/g	0.072	--[b]	--
316-5_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	7.7	--[d]	--
316-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	45	--[d]	--
331 LSLDF_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	25	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	590	2.23E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	0.56	7,793	No
331 LSLDF_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	µg/kg	0.39	285	No
331 LSLDF_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.90E+06	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	360	270,034	No
331 LSLDF_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	850	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,400	37,999	No
331 LSLDF_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	78,600	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	570	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	910	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,700	1.08E+08	No
331 LSLDF_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	340	8.41E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	140	3.52E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,300	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,400	2.41E+08	No
331 LSLDF_Shallow_Focused	non-Rad	Dieldrin	60-57-1	µg/kg	13	2,733	No
331 LSLDF_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	98	2.85E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan I	959-98-8	µg/kg	1.9	2.46E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	µg/kg	3.1	2.46E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.20E+07	1.43E+08	No

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
331 LSLDF_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	9,000	1.06E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	349,000	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	110	1.41E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	µg/kg	3.3	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	11	2,098	No
331 LSLDF_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	590	2.58E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	41,700	1.36E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	9,500	3.03E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,100	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	2,300	101,630[c]	No
331 LSLDF_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	53,100	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	137,000	--[b]	--
331 LSLDF_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	--[d]	--
331 LSLDF_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.47	--[d]	--
600-243_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	µg/kg	279	1.07E+06	No
600-243_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	31	--[b]	--
600-243_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	1,300	270,034	No
600-243_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	27	--[b]	--
600-243_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	18	--[b]	--
600-243_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,159	37,999	No
600-243_Shallow	non-Rad	Barium	7440-39-3	µg/kg	292,072	--[b]	--
600-243_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	43	--[b]	--
600-243_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	43	--[b]	--
600-243_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	46	--[b]	--
600-243_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	32	--[b]	--
600-243_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	2,079	--[b]	--
600-243_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	432	--[b]	--
600-243_Shallow	non-Rad	Boron	7440-42-8	µg/kg	294,463	1.08E+08	No
600-243_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	793	3.52E+06	No
600-243_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	18,006	--[b]	--
600-243_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	63	--[b]	--
600-243_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,207	--[b]	--
600-243_Shallow	non-Rad	Copper	7440-50-8	µg/kg	53,981	2.41E+08	No
600-243_Shallow	non-Rad	Dibenzofuran	132-64-9	µg/kg	78	2.32E+06	No
600-243_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	37	2.85E+07	No
600-243_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	79	--[b]	--
600-243_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	28	--[b]	--
600-243_Shallow	non-Rad	Lead	7439-92-1	µg/kg	40,139	1.06E+07	No
600-243_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	208,289	--[b]	--
600-243_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	1,869	2.58E+07	No
600-243_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	204	2.26E+06	No
600-243_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	21,395	--[b]	--
600-243_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	70	--[b]	--
600-243_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	5,709	3.02E+06	No
600-243_Shallow	non-Rad	Silver	7440-22-4	µg/kg	500	--[b]	--
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	95,319	2.00E+06[e]	No
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	334,524	2.00E+06[e]	No
600-243_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	46,986	--[b]	--
600-243_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	84,099	--[b]	--
600-259_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.034	--[b]	--
600-259_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.068	--[b]	--
600-259_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.038	--[b]	--
600-47_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,300	37,999	No
600-47_Shallow	non-Rad	Barium	7440-39-3	µg/kg	67,000	--[b]	--
600-47_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	500	--[b]	--
600-47_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	90	3.52E+06	No
600-47_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	5,500	--[b]	--
600-47_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,500	1.06E+07	No
600-47_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,303	101,630[c]	No
600-47_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	--[d]	--
600-47_Shallow	Rad	Uranium-238	U-238	pCi/g	1.6	--[d]	--
618-1_Deep	non-Rad	Aluminum	7429-90-5	µg/kg	6.37E+06	--[b]	--
618-1_Deep	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,760	--[b]	--
618-1_Deep	non-Rad	Aroclor-1260	11096-82-5	µg/kg	294	--[b]	--
618-1_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,550	37,999	No
618-1_Deep	non-Rad	Barium	7440-39-3	µg/kg	299,000	--[b]	--
618-1_Deep	non-Rad	Beryllium	7440-41-7	µg/kg	218	--[b]	--
618-1_Deep	non-Rad	Boron	7440-42-8	µg/kg	1,360	1.08E+08	No
618-1_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	263	3.52E+06	No
618-1_Deep	non-Rad	Chromium	7440-47-3	µg/kg	7,740	--[b]	--
618-1_Deep	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	--[b]	--
618-1_Deep	non-Rad	Copper	7440-50-8	µg/kg	46,300	2.41E+08	No
618-1_Deep	non-Rad	Fluoride	16984-48-8	µg/kg	2,800	--[b]	--
618-1_Deep	non-Rad	Iron	7439-89-6	µg/kg	2.47E+07	1.43E+08	No
618-1_Deep	non-Rad	Lead	7439-92-1	µg/kg	58,400	1.06E+07	No
618-1_Deep	non-Rad	Lithium	7439-93-2	µg/kg	5,980	--[b]	--
618-1_Deep	non-Rad	Manganese	7439-96-5	µg/kg	352,000	--[b]	--
618-1_Deep	non-Rad	Mercury	7439-97-6	µg/kg	1,180	1.41E+06	No
618-1_Deep	non-Rad	Molybdenum	7439-98-7	µg/kg	493	2.58E+07	No
618-1_Deep	non-Rad	Nickel	7440-02-0	µg/kg	17,600	--[b]	--
618-1_Deep	non-Rad	Nitrate	14797-55-8	µg/kg	1,700	1.36E+07	No
618-1_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	220	3.03E+06	No
618-1_Deep	non-Rad	Uranium	7440-61-1	µg/kg	37,400	101,630[c]	No

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-1_Deep	non-Rad	Vanadium	7440-62-2	µg/kg	73,000	--[b]	--
618-1_Deep	non-Rad	Zinc	7440-66-6	µg/kg	134,000	--[b]	--
618-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.46	--[b]	--
618-1_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	33	--[d]	--
618-1_Deep	Rad	Uranium-235	15117-96-1	pCi/g	2.7	--[d]	--
618-1_Deep	Rad	Uranium-238	U-238	pCi/g	32	--[d]	--
618-1_Deep_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.57E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	407	270,034	No
618-1_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1.24E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	99	--[b]	--
618-1_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,580	37,999	No
618-1_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	1.87E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	323	--[b]	--
618-1_Deep_Focused	non-Rad	Boron	7440-42-8	µg/kg	6,620	1.08E+08	No
618-1_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,030	3.52E+06	No
618-1_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	18,900	--[b]	--
618-1_Deep_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,920	--[b]	--
618-1_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	68,700	2.41E+08	No
618-1_Deep_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	3,300	--[b]	--
618-1_Deep_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.41E+07	1.43E+08	No
618-1_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	333,000	1.06E+07	No
618-1_Deep_Focused	non-Rad	Lithium	7439-93-2	µg/kg	8,450	--[b]	--
618-1_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	351,000	--[b]	--
618-1_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	8,940	1.41E+06	No
618-1_Deep_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	2,140	2.58E+07	No
618-1_Deep_Focused	non-Rad	Nickel	7440-02-0	µg/kg	13,700	--[b]	--
618-1_Deep_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	11,900	1.36E+07	No
618-1_Deep_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,560	3.03E+06	No
618-1_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,290	--[b]	--
618-1_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	209,000	101,630[c]	Yes
618-1_Deep_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	70,900	--[b]	--
618-1_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	82,000	--[b]	--
618-1_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	6.5	--[b]	--
618-1_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	70	--[d]	--
618-1_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.5	--[d]	--
618-1_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	65	--[d]	--
618-1_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.21E+06	--[b]	--
618-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	264	--[b]	--
618-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	54	--[b]	--
618-1_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,280	37,999	No
618-1_Shallow	non-Rad	Barium	7440-39-3	µg/kg	97,200	--[b]	--
618-1_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	188	--[b]	--
618-1_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,190	1.08E+08	No
618-1_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	68	3.52E+06	No
618-1_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,930	--[b]	--
618-1_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,360	--[b]	--
618-1_Shallow	non-Rad	Copper	7440-50-8	µg/kg	11,400	2.41E+08	No
618-1_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	400	--[b]	--
618-1_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07	1.43E+08	No
618-1_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,100	1.06E+07	No
618-1_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	6,380	--[b]	--
618-1_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	300,000	--[b]	--
618-1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	31	1.41E+06	No
618-1_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	336	2.58E+07	No
618-1_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,150	--[b]	--
618-1_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	1,600	1.36E+07	No
618-1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	300	3.03E+06	No
618-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,224	101,630[c]	No
618-1_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	56,300	--[b]	--
618-1_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	42,100	--[b]	--
618-1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	--[d]	--
618-1_Shallow	Rad	Uranium-238	U-238	pCi/g	1.5	--[d]	--
618-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	1.22E+07	--[b]	--
618-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	455	270,034	No
618-1_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	35	91,112	No
618-1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	981	--[b]	--
618-1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	56	--[b]	--
618-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	6,090	37,999	No
618-1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	102,000	--[b]	--
618-1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	371	--[b]	--
618-1_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	3,740	1.08E+08	No
618-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	266	3.52E+06	No
618-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	19,500	--[b]	--
618-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	--[b]	--
618-1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	23,800	2.41E+08	No
618-1_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	900	--[b]	--
618-1_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.28E+07	1.43E+08	No
618-1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,210	1.06E+07	No
618-1_Shallow_Focused	non-Rad	Lithium	7439-93-2	µg/kg	13,300	--[b]	--
618-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	403,000	--[b]	--
618-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	198	1.41E+06	No
618-1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	356	2.58E+07	No
618-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	16,800	--[b]	--
618-1_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	3,800	1.36E+07	No

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	260	3.03E+06	No
618-1_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,120	--[b]	--
618-1_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	7,080	101,630[c]	No
618-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	64,700	--[b]	--
618-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	68,100	--[b]	--
618-1_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-1_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.99	--[d]	--
618-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	8.2	--[d]	--
618-12_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	8,557	37,999	No
618-12_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	63	--[b]	--
618-12_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	60	8.41E+06	No
618-12_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	32,092	101,630[c]	No
618-12_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.47	--[d]	--
618-12_Shallow	Rad	Uranium-238	U-238	pCi/g	11	--[d]	--
618-13_Shallow	non-Rad	Acetone	67-64-1	µg/kg	8.6	2.23E+06	No
618-13_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.34E+06	--[b]	--
618-13_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	312	270,034	No
618-13_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,500	37,999	No
618-13_Shallow	non-Rad	Barium	7440-39-3	µg/kg	74,000	--[b]	--
618-13_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	212	--[b]	--
618-13_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,050	1.08E+08	No
618-13_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	63	3.52E+06	No
618-13_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,700	--[b]	--
618-13_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,290	--[b]	--
618-13_Shallow	non-Rad	Copper	7440-50-8	µg/kg	11,500	2.41E+08	No
618-13_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.01E+07	1.43E+08	No
618-13_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,620	1.06E+07	No
618-13_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	344,000	--[b]	--
618-13_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	5.1	2,098	No
618-13_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	420	2.58E+07	No
618-13_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,400	--[b]	--
618-13_Shallow	non-Rad	Tin	7440-31-5	µg/kg	1,050	--[b]	--
618-13_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,750	101,630[c]	No
618-13_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	55,800	--[b]	--
618-13_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,400	--[b]	--
618-13_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.038	--[b]	--
618-13_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	--[d]	--
618-13_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
618-13_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	5.9	2.23E+06	No
618-13_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.22E+06	--[b]	--
618-13_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	233	270,034	No
618-13_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,390	37,999	No
618-13_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	57,700	--[b]	--
618-13_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	184	--[b]	--
618-13_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	960	1.08E+08	No
618-13_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	47	3.52E+06	No
618-13_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,740	--[b]	--
618-13_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,710	--[b]	--
618-13_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,100	2.41E+08	No
618-13_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	150	6,000[f]	No
618-13_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.79E+07	1.43E+08	No
618-13_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	4,940	1.06E+07	No
618-13_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	268,000	--[b]	--
618-13_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	5.0	2,098	No
618-13_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	297	2.58E+07	No
618-13_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000	--[b]	--
618-13_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	745	--[b]	--
618-13_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	1,500	101,630[c]	No
618-13_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	48,600	--[b]	--
618-13_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	37,100	--[b]	--
618-13_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
618-13_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.96	--[d]	--
618-2_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	1,500	37,999	No
618-2_Deep	non-Rad	Barium	7440-39-3	µg/kg	83,300	--[b]	--
618-2_Deep	non-Rad	Chromium	7440-47-3	µg/kg	6,700	--[b]	--
618-2_Deep	non-Rad	Lead	7439-92-1	µg/kg	6,600	1.06E+07	No
618-2_Deep	non-Rad	Selenium	7782-49-2	µg/kg	780	3.02E+06	No
618-2_Deep	non-Rad	Tin	7440-31-5	µg/kg	2,900	--[b]	--
618-2_Deep	non-Rad	Uranium	7440-61-1	µg/kg	501,000	101,630[c]	Yes
618-2_Deep	Rad	Americium-241	14596-10-2	pCi/g	7.9	--[b]	--
618-2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	1.0	--[b]	--
618-2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	1.5	--[b]	--
618-2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	91	--[b]	--
618-2_Deep	Rad	Plutonium-241	14119-32-5	pCi/g	42	--[b]	--
618-2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	12	227,428	No
618-2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	161	--[d]	--
618-2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.78	--[d]	--
618-2_Deep	Rad	Uranium-238	U-238	pCi/g	165	--[d]	--
618-2_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	6.9	--[b]	--
618-2_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,300	37,999	No
618-2_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	109,000	--[b]	--
618-2_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	27	--[b]	--
618-2_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	200	3.52E+06	No
618-2_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,400	--[b]	--

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-2_Deep_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	18	2.85E+07	No
618-2_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,800	1.06E+07	No
618-2_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	1,200	3.02E+06	No
618-2_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	600	--[b]	--
618-2_Deep_Focused	non-Rad	Tin	7440-31-5	µg/kg	42,500	--[b]	--
618-2_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	148,000	101,630[c]	Yes
618-2_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	9.2	--[b]	--
618-2_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.1	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-238	13981-16-3	pCi/g	1.6	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	92	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-241	14119-32-5	pCi/g	33	--[b]	--
618-2_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	7.2	227,428	No
618-2_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	48	--[d]	--
618-2_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	2.4	--[d]	--
618-2_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	50	--[d]	--
618-2_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	37,999	No
618-2_Overburden	non-Rad	Barium	7440-39-3	µg/kg	74,700	--[b]	--
618-2_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	6,600	--[b]	--
618-2_Overburden	non-Rad	Lead	7439-92-1	µg/kg	4,300	1.06E+07	No
618-2_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	1,000	3.02E+06	No
618-2_Overburden	non-Rad	Tin	7440-31-5	µg/kg	2,700	--[b]	--
618-2_Overburden	non-Rad	Uranium	7440-61-1	µg/kg	1,140	101,630[c]	No
618-2_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.058	--[b]	--
618-2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.64	--[d]	--
618-2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.59	--[d]	--
618-2_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	1,900	37,999	No
618-2_Shallow	non-Rad	Barium	7440-39-3	µg/kg	79,100	--[b]	--
618-2_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,100	--[b]	--
618-2_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,600	1.06E+07	No
618-2_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	760	3.02E+06	No
618-2_Shallow	non-Rad	Tin	7440-31-5	µg/kg	2,400	--[b]	--
618-2_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	4,530	101,630[c]	No
618-2_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.81	--[b]	--
618-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.2	--[b]	--
618-2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	7.7	--[b]	--
618-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.2	--[d]	--
618-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.21	--[d]	--
618-2_Shallow	Rad	Uranium-238	U-238	pCi/g	2.2	--[d]	--
618-2_Staging Pile	non-Rad	Arsenic	7440-38-2	µg/kg	3,063	37,999	No
618-2_Staging Pile	non-Rad	Barium	7440-39-3	µg/kg	67,690	--[b]	--
618-2_Staging Pile	non-Rad	Chromium	7440-47-3	µg/kg	6,424	--[b]	--
618-2_Staging Pile	non-Rad	Lead	7439-92-1	µg/kg	4,011	1.06E+07	No
618-2_Staging Pile	non-Rad	Uranium	7440-61-1	µg/kg	5,022	101,630[c]	No
618-2_Staging Pile	Rad	Americium-241	14596-10-2	pCi/g	0.82	--[b]	--
618-2_Staging Pile	Rad	Cesium-137	10045-97-3	pCi/g	0.095	--[b]	--
618-2_Staging Pile	Rad	Plutonium-239/240	PU-239/240	pCi/g	10	--[b]	--
618-2_Staging Pile	Rad	Tritium	10028-17-8	pCi/g	2.3	9,176	No
618-2_Staging Pile	Rad	Uranium-233/234	U-233/234	pCi/g	2.0	--[d]	--
618-2_Staging Pile	Rad	Uranium-235	15117-96-1	pCi/g	0.12	--[d]	--
618-2_Staging Pile	Rad	Uranium-238	U-238	pCi/g	2.0	--[d]	--
618-3_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,800	37,999	No
618-3_Shallow	non-Rad	Barium	7440-39-3	µg/kg	76,500	--[b]	--
618-3_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,700	--[b]	--
618-3_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,900	1.06E+07	No
618-3_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	659	3.02E+06	No
618-3_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,610	101,630[c]	No
618-3_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.68	--[d]	--
618-3_Shallow	Rad	Uranium-238	U-238	pCi/g	0.75	--[d]	--
618-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	238,577	101,630[c]	Yes
618-3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	80	--[d]	--
618-3_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.8	--[d]	--
618-3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	79	--[d]	--
618-4_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,200	37,999	No
618-4_Deep	non-Rad	Lead	7439-92-1	µg/kg	20,000	1.06E+07	No
618-4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	64,506	101,630[c]	No
618-4_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	20	--[d]	--
618-4_Deep	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
618-4_Deep	Rad	Uranium-238	U-238	pCi/g	22	--[d]	--
618-4_Deep_Focused	non-Rad	2-Butanone	78-93-3	µg/kg	130	1.67E+06	No
618-4_Deep_Focused	non-Rad	Acetone	67-64-1	µg/kg	16	2.23E+06	No
618-4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,600	--[b]	--
618-4_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	37,999	No
618-4_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	104,000	--[b]	--
618-4_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	4,700	--[b]	--
618-4_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,500	3.52E+06	No
618-4_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	27,700	--[b]	--
618-4_Deep_Focused	non-Rad	Diethyl ether	60-29-7	µg/kg	1.0	664,052	No
618-4_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	24,900	1.06E+07	No
618-4_Deep_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	40	2,098	No
618-4_Deep_Focused	non-Rad	Phenol	108-95-2	µg/kg	110	1.49E+06	No
618-4_Deep_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	24	275	No
618-4_Deep_Focused	non-Rad	Toluene	108-88-3	µg/kg	4.8	1.15E+06	No
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	34,000	2.00E+06[e]	No

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - kerosene range	TPHKEROSENE	µg/kg	42,000	2.00E+06[e]	No
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	65	2.00E+06[e]	No
618-4_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	20,777	101,630[c]	No
618-4_Deep_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	690	No
618-4_Deep_Focused	non-Rad	Trichloromonofluoromethane	75-69-4	µg/kg	12	1.95E+06	No
618-4_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	7.2	--[d]	--
618-4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.51	--[d]	--
618-4_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	6.9	--[d]	--
618-4_Overburden_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,500	37,999	No
618-4_Overburden_2	non-Rad	Lead	7439-92-1	µg/kg	4,700	1.06E+07	No
618-4_Overburden_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,197	101,630[c]	No
618-4_Overburden_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
618-4_Overburden_2	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
618-4_Overburden_3	non-Rad	Lead	7439-92-1	µg/kg	5,000	1.06E+07	No
618-4_Overburden_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,171	101,630[c]	No
618-4_Overburden_3	Rad	Uranium-233/234	U-233/234	pCi/g	0.42	--[d]	--
618-4_Overburden_3	Rad	Uranium-235	15117-96-1	pCi/g	0.032	--[d]	--
618-4_Overburden_3	Rad	Uranium-238	U-238	pCi/g	0.44	--[d]	--
618-4_Overburden_4	non-Rad	Lead	7439-92-1	µg/kg	4,800	1.06E+07	No
618-4_Overburden_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,323	101,630[c]	No
618-4_Overburden_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.94	--[d]	--
618-4_Overburden_4	Rad	Uranium-238	U-238	pCi/g	0.94	--[d]	--
618-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,200	37,999	No
618-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	49,000	1.06E+07	No
618-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	7,456	101,630[c]	No
618-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	3.2	--[d]	--
618-4_Shallow	Rad	Uranium-238	U-238	pCi/g	3.1	--[d]	--
618-5_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	5,200	37,999	No
618-5_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	470	3.52E+06	No
618-5_Deep	non-Rad	Chromium	7440-47-3	µg/kg	14,700	--[b]	--
618-5_Deep	non-Rad	Lead	7439-92-1	µg/kg	82,300	1.06E+07	No
618-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	26,618	101,630[c]	No
618-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	8.6	--[d]	--
618-5_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.46	--[d]	--
618-5_Deep	Rad	Uranium-238	U-238	pCi/g	8.9	--[d]	--
618-5_Deep_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.65E+06	--[b]	--
618-5_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	1,800	270,034	No
618-5_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,500	37,999	No
618-5_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	106,000	--[b]	--
618-5_Deep_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	672	--[b]	--
618-5_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,500	--[b]	--
618-5_Deep_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	10,500	--[b]	--
618-5_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	21,400	2.41E+08	No
618-5_Deep_Focused	non-Rad	Iron	7439-89-6	µg/kg	3.02E+07	1.43E+08	No
618-5_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,600	1.06E+07	No
618-5_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	579,000	--[b]	--
618-5_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	33	1.41E+06	No
618-5_Deep_Focused	non-Rad	Nickel	7440-02-0	µg/kg	11,300	--[b]	--
618-5_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	2,270	3.02E+06	No
618-5_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	36,540	101,630[c]	No
618-5_Deep_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	79,500	--[b]	--
618-5_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	65,800	--[b]	--
618-5_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-5_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.48	--[d]	--
618-5_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	12	--[d]	--
618-5_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,400	37,999	No
618-5_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	170	3.52E+06	No
618-5_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	9,700	--[b]	--
618-5_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,500	1.06E+07	No
618-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	9,773	101,630[c]	No
618-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	4.1	--[d]	--
618-5_Overburden	Rad	Uranium-238	U-238	pCi/g	4.6	--[d]	--
618-5_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,300	37,999	No
618-5_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,300	--[b]	--
618-5_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,100	1.06E+07	No
618-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,849	101,630[c]	No
618-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.94	--[d]	--
618-5_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
618-5_Staging Pile_4	non-Rad	Arsenic	7440-38-2	µg/kg	3,300	37,999	No
618-5_Staging Pile_4	non-Rad	Cadmium	7440-43-9	µg/kg	50	3.52E+06	No
618-5_Staging Pile_4	non-Rad	Chromium	7440-47-3	µg/kg	11,800	--[b]	--
618-5_Staging Pile_4	non-Rad	Lead	7439-92-1	µg/kg	5,300	1.06E+07	No
618-5_Staging Pile_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,364	101,630[c]	No
618-5_Staging Pile_4	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	--[d]	--
618-5_Staging Pile_4	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
618-5_Staging Pile_5	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	37,999	No
618-5_Staging Pile_5	non-Rad	Chromium	7440-47-3	µg/kg	10,300	--[b]	--
618-5_Staging Pile_5	non-Rad	Lead	7439-92-1	µg/kg	3,900	1.06E+07	No
618-5_Staging Pile_5	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,326	101,630[c]	No
618-5_Staging Pile_5	Rad	Uranium-233/234	U-233/234	pCi/g	1.5	--[d]	--
618-5_Staging Pile_5	Rad	Uranium-235	15117-96-1	pCi/g	0.17	--[d]	--
618-5_Staging Pile_5	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
618-7_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	5.25E+06	--[b]	--
618-7_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	560	270,034	No

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-7_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	1,891	37,999	No
618-7_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	68,874	--[b]	--
618-7_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	278	--[b]	--
618-7_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	65	3.52E+06	No
618-7_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	10,227	--[b]	--
618-7_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	9,152	--[b]	--
618-7_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	16,120	2.41E+08	No
618-7_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	2.60E+07	1.43E+08	No
618-7_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	14,567	1.06E+07	No
618-7_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	326,067	--[b]	--
618-7_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	44	1.41E+06	No
618-7_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	20,977	--[b]	--
618-7_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,547	--[b]	--
618-7_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	10,814	101,630[c]	No
618-7_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	74,576	--[b]	--
618-7_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	49,177	--[b]	--
618-7_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.067	--[b]	--
618-7_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	3.6	--[d]	--
618-7_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	0.36	--[d]	--
618-7_Shallow_1	Rad	Uranium-238	U-238	pCi/g	3.6	--[d]	--
618-7_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	4.97E+06	--[b]	--
618-7_Shallow_2	non-Rad	Antimony	7440-36-0	µg/kg	660	270,034	No
618-7_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,500	37,999	No
618-7_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	73,800	--[b]	--
618-7_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	440	--[b]	--
618-7_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	6,800	--[b]	--
618-7_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	9,300	--[b]	--
618-7_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	13,600	2.41E+08	No
618-7_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	2.60E+07	1.43E+08	No
618-7_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	2,800	1.06E+07	No
618-7_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	364,000	--[b]	--
618-7_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	20	1.41E+06	No
618-7_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	9,700	--[b]	--
618-7_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,500	--[b]	--
618-7_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,574	101,630[c]	No
618-7_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	74,700	--[b]	--
618-7_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	46,200	--[b]	--
618-7_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.57	--[d]	--
618-7_Shallow_2	Rad	Uranium-238	U-238	pCi/g	0.53	--[d]	--
618-7_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	6.74E+06	--[b]	--
618-7_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	450	270,034	No
618-7_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	2,800	37,999	No
618-7_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	82,500	--[b]	--
618-7_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	310	--[b]	--
618-7_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	190	3.52E+06	No
618-7_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	10,100	--[b]	--
618-7_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	--[b]	--
618-7_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	13,600	2.41E+08	No
618-7_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.43E+07	1.43E+08	No
618-7_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	4,300	1.06E+07	No
618-7_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	357,000	--[b]	--
618-7_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	20	1.41E+06	No
618-7_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	10,100	--[b]	--
618-7_Shallow_3	non-Rad	Tin	7440-31-5	µg/kg	1,800	--[b]	--
618-7_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,852	101,630[c]	No
618-7_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	68,200	--[b]	--
618-7_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	44,500	--[b]	--
618-7_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
618-7_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.085	--[d]	--
618-7_Shallow_3	Rad	Uranium-238	U-238	pCi/g	0.95	--[d]	--
618-7_Shallow_4	non-Rad	Aluminum	7429-90-5	µg/kg	5.65E+06	--[b]	--
618-7_Shallow_4	non-Rad	Antimony	7440-36-0	µg/kg	250	270,034	No
618-7_Shallow_4	non-Rad	Arsenic	7440-38-2	µg/kg	5,200	37,999	No
618-7_Shallow_4	non-Rad	Barium	7440-39-3	µg/kg	57,900	--[b]	--
618-7_Shallow_4	non-Rad	Beryllium	7440-41-7	µg/kg	220	--[b]	--
618-7_Shallow_4	non-Rad	Cadmium	7440-43-9	µg/kg	90	3.52E+06	No
618-7_Shallow_4	non-Rad	Chromium	7440-47-3	µg/kg	11,400	--[b]	--
618-7_Shallow_4	non-Rad	Cobalt	7440-48-4	µg/kg	6,700	--[b]	--
618-7_Shallow_4	non-Rad	Copper	7440-50-8	µg/kg	13,200	2.41E+08	No
618-7_Shallow_4	non-Rad	Iron	7439-89-6	µg/kg	2.12E+07	1.43E+08	No
618-7_Shallow_4	non-Rad	Lead	7439-92-1	µg/kg	3,000	1.06E+07	No
618-7_Shallow_4	non-Rad	Manganese	7439-96-5	µg/kg	285,000	--[b]	--
618-7_Shallow_4	non-Rad	Nickel	7440-02-0	µg/kg	12,900	--[b]	--
618-7_Shallow_4	non-Rad	Tin	7440-31-5	µg/kg	710	--[b]	--
618-7_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,064	101,630[c]	No
618-7_Shallow_4	non-Rad	Vanadium	7440-62-2	µg/kg	54,800	--[b]	--
618-7_Shallow_4	non-Rad	Zinc	7440-66-6	µg/kg	37,000	--[b]	--
618-7_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.69	--[d]	--
618-7_Shallow_4	Rad	Uranium-238	U-238	pCi/g	0.76	--[d]	--
618-7_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	150	7.38E+07	No
618-7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.61E+06	--[b]	--
618-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	980	270,034	No
618-7_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	6.7	91,112	No
618-7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,200	37,999	No

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-7_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	92,800	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	88	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	66	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	52	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	11	--[b]	--
618-7_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	370	--[b]	--
618-7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	470	--[b]	--
618-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	6,200	3.52E+06	No
618-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	65,900	--[b]	--
618-7_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	69	--[b]	--
618-7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,000	--[b]	--
618-7_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	25,000	2.41E+08	No
618-7_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	45	--[b]	--
618-7_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	33	2.85E+07	No
618-7_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	48	--[b]	--
618-7_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.87E+07	1.43E+08	No
618-7_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,500	1.06E+07	No
618-7_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	425,000	--[b]	--
618-7_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	20	1.41E+06	No
618-7_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	17,200	--[b]	--
618-7_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	410	--[b]	--
618-7_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,200	--[b]	--
618-7_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	680,000	2.00E+06[e]	No
618-7_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	19,563	101,630[c]	No
618-7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	80,500	--[b]	--
618-7_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	52,400	--[b]	--
618-7_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.010	--[b]	--
618-7_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-7_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.97	--[d]	--
618-7_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	6.4	--[d]	--
618-8_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,100	37,999	No
618-8_Shallow	non-Rad	Barium	7440-39-3	µg/kg	97,600	--[b]	--
618-8_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	12,400	--[b]	--
618-8_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,100	1.06E+07	No
618-8_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	846	3.02E+06	No
618-8_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,720	101,630[c]	No
618-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	--[d]	--
618-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.73	--[d]	--
618-9_Shallow_Focused	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	110	270	No
618-9_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	680	2.23E+06	No
618-9_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	390	7,793	No
618-9_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.57E+06	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1016	12674-11-2	µg/kg	1,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1221	11104-28-2	µg/kg	1,900	5,773	No
618-9_Shallow_Focused	non-Rad	Aroclor-1232	11141-16-5	µg/kg	1,900	5,773	No
618-9_Shallow_Focused	non-Rad	Aroclor-1242	53469-21-9	µg/kg	1,900	97,738	No
618-9_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,900	91,112	No
618-9_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	11,600	37,999	No
618-9_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	90,200	--[b]	--
618-9_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	330	--[b]	--
618-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	5,200	--[b]	--
618-9_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	2,700	8.41E+06	No
618-9_Shallow_Focused	non-Rad	Chlordane	57-74-9	µg/kg	69	--[b]	--
618-9_Shallow_Focused	non-Rad	Chloroform	67-66-3	µg/kg	9.0	1,289	No
618-9_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,700	--[b]	--
618-9_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,400	--[b]	--
618-9_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	16,700	2.41E+08	No
618-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	7,200	2.85E+07	No
618-9_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	44	--[b]	--
618-9_Shallow_Focused	non-Rad	Hexachlorobutadiene	87-68-3	µg/kg	760	--[b]	--
618-9_Shallow_Focused	non-Rad	Hexachloroethane	67-72-1	µg/kg	17,000	65,103	No
618-9_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.49E+07	1.43E+08	No
618-9_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	7,700	1.06E+07	No
618-9_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	359,000	--[b]	--
618-9_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	330	1.41E+06	No
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	2,098	Yes
618-9_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,600	--[b]	--
618-9_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	1.67E+06	1.36E+07	No
618-9_Shallow_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	920	275	Yes
618-9_Shallow_Focused	non-Rad	Toluene	108-88-3	µg/kg	9.0	1.15E+06	No
618-9_Shallow_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	690	No
618-9_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	3,100	101,630[c]	No
618-9_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	59,300	--[b]	--
618-9_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	52,300	--[b]	--
618-9_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.071	--[d]	--
618-9_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	3.0	--[d]	--
628-4_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,374	37,999	No
628-4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	61	--[b]	--
628-4_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,284	1.06E+07	No
628-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,308	101,630[c]	No
628-4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.033	--[b]	--
628-4_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.87	--[d]	--

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
628-4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.78	--[d]	--
628-4_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	42	97,738	No
628-4_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,115	91,112	No
628-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	243	--[b]	--
628-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	38	--[b]	--
628-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,864	37,999	No
628-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	99,167	1.06E+07	No
628-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,163	101,630[c]	No
628-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
628-4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.11	--[d]	--
628-4_Shallow	Rad	Uranium-238	U-238	pCi/g	1.0	--[d]	--
UPR-300-17_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	117	7.38E+07	No
UPR-300-17_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.34E+06	--[b]	--
UPR-300-17_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	7.0	--[b]	--
UPR-300-17_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	359	270,034	No
UPR-300-17_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,970	91,112	No
UPR-300-17_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	450	--[b]	--
UPR-300-17_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	113	--[b]	--
UPR-300-17_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,573	37,999	No
UPR-300-17_Shallow	non-Rad	Barium	7440-39-3	µg/kg	81,014	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	59	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	44	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	33	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	9.9	--[b]	--
UPR-300-17_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	240	--[b]	--
UPR-300-17_Shallow	non-Rad	Boron	7440-42-8	µg/kg	3,903	1.08E+08	No
UPR-300-17_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	173	3.52E+06	No
UPR-300-17_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	13,795	--[b]	--
UPR-300-17_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	39	--[b]	--
UPR-300-17_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,688	--[b]	--
UPR-300-17_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,135	2.41E+08	No
UPR-300-17_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	35	--[b]	--
UPR-300-17_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.9	6.17E+07	No
UPR-300-17_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	5.9	--[b]	--
UPR-300-17_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07	1.43E+08	No
UPR-300-17_Shallow	non-Rad	Lead	7439-92-1	µg/kg	11,240	1.06E+07	No
UPR-300-17_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	285,159	--[b]	--
UPR-300-17_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	69	1.41E+06	No
UPR-300-17_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	412	2.58E+07	No
UPR-300-17_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	48	2.26E+06	No
UPR-300-17_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	563,654	--[b]	--
UPR-300-17_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	34	--[b]	--
UPR-300-17_Shallow	non-Rad	Silver	7440-22-4	µg/kg	340	--[b]	--
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,950	2.00E+06[e]	No
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	210,420	2.00E+06[e]	No
UPR-300-17_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,420	101,630[c]	No
UPR-300-17_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	52,150	--[b]	--
UPR-300-17_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	157,172	--[b]	--
UPR-300-17_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	6.1	--[d]	--
UPR-300-17_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.91	--[d]	--
UPR-300-17_Shallow	Rad	Uranium-238	U-238	pCi/g	4.0	--[d]	--
UPR-300-46_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	13	7.38E+07	No
UPR-300-46_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.80E+06	--[b]	--
UPR-300-46_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	381	270,034	No
UPR-300-46_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	879	91,112	No
UPR-300-46_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	490	--[b]	--
UPR-300-46_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	84	--[b]	--
UPR-300-46_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,846	37,999	No
UPR-300-46_Shallow	non-Rad	Barium	7440-39-3	µg/kg	82,137	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	3.9	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	5.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.8	--[b]	--
UPR-300-46_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	222	--[b]	--
UPR-300-46_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,714	1.08E+08	No
UPR-300-46_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	95	3.52E+06	No
UPR-300-46_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,173	--[b]	--
UPR-300-46_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	5.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,361	--[b]	--
UPR-300-46_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,151	2.41E+08	No
UPR-300-46_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	1.3	--[b]	--
UPR-300-46_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	9.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.2	6.17E+07	No
UPR-300-46_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	7.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07	1.43E+08	No
UPR-300-46_Shallow	non-Rad	Lead	7439-92-1	µg/kg	7,105	1.06E+07	No
UPR-300-46_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	311,001	--[b]	--
UPR-300-46_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	29	1.41E+06	No
UPR-300-46_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	456	2.58E+07	No
UPR-300-46_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	36	2.26E+06	No
UPR-300-46_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,230	--[b]	--
UPR-300-46_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	4.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,897	101,630[c]	No
UPR-300-46_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	53,808	--[b]	--

Table A-1. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
UPR-300-46_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	47,945	--[b]	--
UPR-300-46_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.070	--[b]	--
UPR-300-46_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.8	--[d]	--
UPR-300-46_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
UPR-300-46_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--

Notes:

a. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

b. The calculated soil screening level for the analyte is considered non-representative because: (1) breakthrough is simulated within 1,000 years for some soil columns while other soil columns (a majority) show no breakthrough (breakthrough defined as concentrations below 1E-04 µg/L or activity below 1E-04 pCi/L), and/or (2) the calculated residual mass of contaminant in the pore volume is high enough to represent a substantial (and physically improbable) reduction in porosity.

c. Due to the complex geochemistry of uranium in 300 Area source operable unit soils, uranium SSLs were derived using a site-speicific two-dimensional model as described in ECF-300FF5-11-0151.

d. Uranium isotopes are accounted for by converting from activity-based (pCi/g) to mass-based (µg/kg) concentrations and then summing to provide a mass-based total uranium exposure point concentration (identified as Total_U_Isotopes), as described in ECF-300NPL-11-0137, Computation of Exposure Point Concentrations for the 300-FF-2 Source Operable Unit.

e. The soil screening level for Total Petroleum Hydrocarbons is a default screening level obtained from WAC 173-340-900, Table 747-5, "Residual Saturation Screening Levels for TPH."

f. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

-- = Not applicable or no value

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300 ASH PITS_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	52	133	No
300 ASH PITS_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,078	11,726	No
300 ASH PITS_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	96	--[b]	--
300 ASH PITS_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	76	1.50E+06	No
300 ASH PITS_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,450	2.64E+06[c]	No
300 ASH PITS_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.039	--[d]	--
300 ASH PITS_Shallow	Rad	Uranium-238	U-238	pCi/g	0.82	--[d]	--
300 VTS_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.029	--[b]	--
300-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	13,500	11,726	Yes
300-10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	200	--[b]	--
300-10_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	230	1.50E+06	No
300-10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,078	2.64E+06[c]	No
300-10_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.16	--[b]	--
300-10_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.041	--[d]	--
300-10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
300-109_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.62E+06	--[b]	--
300-109_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	122	--[b]	--
300-109_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	40	--[b]	--
300-109_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,420	11,726	No
300-109_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	63,300	--[b]	--
300-109_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.2	--[b]	--
300-109_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	2.3	--[b]	--
300-109_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	180	--[b]	--
300-109_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	632	--[e]	--
300-109_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	59	176,066	No
300-109_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,950	--[b]	--
300-109_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	1.8	--[b]	--
300-109_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	6,420	--[b]	--
300-109_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,800	3.40E+06	No
300-109_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	14	--[b]	--
300-109_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.75E+07	1.43E+08	No
300-109_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,890	1.48E+06	No
300-109_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	278,000	--[b]	--
300-109_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	22	8,451	No
300-109_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	341	--[b]	--
300-109_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,490	--[b]	--
300-109_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	1.6	--[b]	--
300-109_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,108	2.64E+06[c]	No
300-109_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	47,600	--[e]	--
300-109_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	34,700	6.41E+07	No
300-109_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	--[d]	--
300-109_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
300-109_Staging Pile Area_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.78E+06	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	37	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	19	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,580	11,726	No
300-109_Staging Pile Area_Focused	non-Rad	Barium	7440-39-3	µg/kg	72,700	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	2.1	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.3	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.3	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	203	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,060	--[e]	--
300-109_Staging Pile Area_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	66	176,066	No
300-109_Staging Pile Area_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,170	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,950	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Copper	7440-50-8	µg/kg	11,600	3.40E+06	No
300-109_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	5.1	2.82E+08	No
300-109_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	29	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.84E+07	1.43E+08	No
300-109_Staging Pile Area_Focused	non-Rad	Lead	7439-92-1	µg/kg	5,030	1.48E+06	No
300-109_Staging Pile Area_Focused	non-Rad	Manganese	7439-96-5	µg/kg	286,000	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	408	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,570	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	µg/kg	7.0	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,450	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,877	2.64E+06[c]	No
300-109_Staging Pile Area_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	45,100	--[e]	--
300-109_Staging Pile Area_Focused	non-Rad	Zinc	7440-66-6	µg/kg	48,800	6.41E+07	No
300-109_Staging Pile Area_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	2.5	--[d]	--
300-109_Staging Pile Area_Focused	Rad	Uranium-238	U-238	pCi/g	2.3	--[d]	--
300-18_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,200	11,726	No
300-18_Shallow	non-Rad	Barium	7440-39-3	µg/kg	63,400	--[b]	--
300-18_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	650	--[b]	--
300-18_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	40	176,066	No
300-18_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	6,900	--[b]	--
300-18_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,600	1.48E+06	No
300-18_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,136	2.64E+06[c]	No
300-18_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.65	--[d]	--
300-18_Shallow	Rad	Uranium-238	U-238	pCi/g	0.41	--[d]	--
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	120,000	--[e]	--
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	230,000	--[e]	--

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300-23_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	52,000	--[e]	--
300-259_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	5.99E+06	--[b]	--
300-259_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	322	252,032	No
300-259_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,096	11,726	No
300-259_Shallow	non-Rad	Barium	7440-39-3	µg/kg	75,232	--[b]	--
300-259_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	226	--[b]	--
300-259_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,303	--[e]	--
300-259_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	252	176,066	No
300-259_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,901	--[b]	--
300-259_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	5,831	--[b]	--
300-259_Shallow	non-Rad	Copper	7440-50-8	µg/kg	10,692	3.40E+06	No
300-259_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	1.43E+08	No
300-259_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,625	1.48E+06	No
300-259_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	318,874	--[b]	--
300-259_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	10	8,451	No
300-259_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	303	--[b]	--
300-259_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,751	--[b]	--
300-259_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,876	2.64E+06[c]	No
300-259_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	42,626	--[e]	--
300-259_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	479,584	6.41E+07	No
300-259_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.6	--[d]	--
300-259_Shallow	Rad	Uranium-238	U-238	pCi/g	1.3	--[d]	--
300-260_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.17E+06	--[b]	--
300-260_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	922	252,032	No
300-260_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,160	11,726	No
300-260_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	122,000	--[b]	--
300-260_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	239	--[b]	--
300-260_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	8,360	--[e]	--
300-260_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	110	176,066	No
300-260_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,890	--[b]	--
300-260_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,430	--[b]	--
300-260_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	73,300	3.40E+06	No
300-260_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.04E+07	1.43E+08	No
300-260_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	18,300	1.48E+06	No
300-260_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	328,000	--[b]	--
300-260_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	12	8,451	No
300-260_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	537	--[b]	--
300-260_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,200	--[b]	--
300-260_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	206	--[b]	--
300-260_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,800	2.64E+06[c]	No
300-260_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	59,000	--[e]	--
300-260_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	77,400	6.41E+07	No
300-260_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.25	--[d]	--
300-260_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	4.3	--[d]	--
300-272_Overburden_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	13,100	--[e]	--
300-272_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	43,100	--[e]	--
300-275_Shallow_1	non-Rad	Acenaphthene	83-32-9	µg/kg	960	4.94E+07	No
300-275_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	5.61E+06	--[b]	--
300-275_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	260	252,032	No
300-275_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	2,211	11,726	No
300-275_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	75,261	--[b]	--
300-275_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.3	--[b]	--
300-275_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.9	--[b]	--
300-275_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	452	--[b]	--
300-275_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	1,466	--[e]	--
300-275_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	83	176,066	No
300-275_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	8,022	--[b]	--
300-275_Shallow_1	non-Rad	Chrysene	218-01-9	µg/kg	2.2	--[b]	--
300-275_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	5,847	--[b]	--
300-275_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	42,923	3.40E+06	No
300-275_Shallow_1	non-Rad	Fluoranthene	206-44-0	µg/kg	2,300	2.82E+08	No
300-275_Shallow_1	non-Rad	Fluorene	86-73-7	µg/kg	81	1.06E+08	No
300-275_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	1.79E+07	1.43E+08	No
300-275_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	7,189	1.48E+06	No
300-275_Shallow_1	non-Rad	Lithium	7439-93-2	µg/kg	6,686	--[e]	--
300-275_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	276,815	--[b]	--
300-275_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	17	8,451	No
300-275_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	378	--[b]	--
300-275_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	9,461	--[b]	--
300-275_Shallow_1	non-Rad	Silver	7440-22-4	µg/kg	121	--[b]	--
300-275_Shallow_1	non-Rad	Strontium	7440-24-6	µg/kg	20,196	--[b]	--
300-275_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,483	--[b]	--
300-275_Shallow_1	non-Rad	Uranium	7440-61-1	µg/kg	2,500	2.64E+06[c]	No
300-275_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	45,128	--[e]	--
300-275_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	41,014	6.41E+07	No
300-275_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.046	--[b]	--
300-275_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	7.7	--[d]	--
300-275_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.0	--[d]	--
300-275_Shallow_1	Rad	Uranium-238	U-238	pCi/g	7.4	--[d]	--
300-275_Shallow_2	non-Rad	Acenaphthene	83-32-9	µg/kg	3.6	4.94E+07	No
300-275_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	6.24E+06	--[b]	--
300-275_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,761	11,726	No

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300-275_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	68,607	--[b]	--
300-275_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	254	--[b]	--
300-275_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	1,147	--[e]	--
300-275_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	144	176,066	No
300-275_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	8,994	--[b]	--
300-275_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	5,977	--[b]	--
300-275_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	11,596	3.40E+06	No
300-275_Shallow_2	non-Rad	Fluoranthene	206-44-0	µg/kg	56	2.82E+08	No
300-275_Shallow_2	non-Rad	Fluorene	86-73-7	µg/kg	2.6	1.06E+08	No
300-275_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	1.43E+08	No
300-275_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	4,099	1.48E+06	No
300-275_Shallow_2	non-Rad	Lithium	7439-93-2	µg/kg	7,067	--[e]	--
300-275_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	292,731	--[b]	--
300-275_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	28	8,451	No
300-275_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	404	--[b]	--
300-275_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	9,593	--[b]	--
300-275_Shallow_2	non-Rad	Strontium	7440-24-6	µg/kg	27,081	--[b]	--
300-275_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,149	--[b]	--
300-275_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,725	2.64E+06[c]	No
300-275_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	51,632	--[e]	--
300-275_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	41,245	6.41E+07	No
300-275_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
300-275_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
300-275_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.2	--[d]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.32E+06	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1016	12674-11-2	µg/kg	10	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	16	143	No
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	190	133	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	84	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	17	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,638	11,726	No
300-33, 300-41, 300-256_Shallow	non-Rad	Barium	7440-39-3	µg/kg	72,411	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	256	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,484	--[e]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	228	1.50E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	94	176,066	No
300-33, 300-41, 300-256_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	8,781	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,273	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,662	3.40E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	1,651	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.00E+07	1.43E+08	No
300-33, 300-41, 300-256_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,268	1.48E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	5,495	--[e]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	314,762	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	16	8,451	No
300-33, 300-41, 300-256_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	2.9	1,931	No
300-33, 300-41, 300-256_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	486	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,880	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	8,617	1.36E+07	No
300-33, 300-41, 300-256_Shallow	non-Rad	Silver	7440-22-4	µg/kg	782	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	7,260	2.64E+06[c]	No
300-33, 300-41, 300-256_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	52,694	--[e]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,462	6.41E+07	No
300-33, 300-41, 300-256_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.1	--[d]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.34	--[d]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-238	U-238	pCi/g	2.1	--[d]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.51E+06	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	330	133	Yes
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	385	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,240	11,726	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	64,600	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	169	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,030	--[e]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	100	176,066	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,080	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,640	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,400	3.40E+06	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	1,300	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.86E+07	1.43E+08	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	3,160	1.48E+06	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Lithium	7439-93-2	µg/kg	6,580	--[e]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	259,000	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2.2	1,931	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	275	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,040	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	17,900	1.36E+07	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,460	2.64E+06[c]	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	51,400	--[e]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	38,900	6.41E+07	No
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	3.0	--[d]	--
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	2.2	--[d]	--

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300-37_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	100	--[b]	--
300-37_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,200	--[b]	--
300-44_Overburden_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	9,100	11,726	No
300-44_Overburden_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,027	2.64E+06[c]	No
300-44_Overburden_Focused	Rad	Uranium-238	U-238	pCi/g	0.35	--[d]	--
300-44_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.71E+06	--[b]	--
300-44_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	4,100	252,032	No
300-44_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	16,900	11,726	Yes
300-44_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	75,200	--[b]	--
300-44_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	480	--[b]	--
300-44_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,300	--[b]	--
300-44_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,200	--[b]	--
300-44_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	7,800	3.40E+06	No
300-44_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.94E+07	1.43E+08	No
300-44_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	303,000	--[b]	--
300-44_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,600	--[b]	--
300-44_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	872	2.64E+06[c]	No
300-44_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	43,200	--[e]	--
300-44_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	37,800	6.41E+07	No
300-44_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.29	--[d]	--
300-45_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	86	--[b]	--
300-45_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	290	--[b]	--
300-45_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,600	2.64E+06[c]	No
300-45_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.023	--[b]	--
300-45_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.061	--[d]	--
300-45_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2	--[d]	--
300-49_Overburden	non-Rad	1,2,4-Trichlorobenzene	120-82-1	µg/kg	31	37,238	No
300-49_Overburden	non-Rad	1,4-Dichlorobenzene	106-46-7	µg/kg	29	164,520	No
300-49_Overburden	non-Rad	2,4-Dinitrotoluene	121-14-2	µg/kg	19	330	No
300-49_Overburden	non-Rad	2-Chlorophenol	95-57-8	µg/kg	51	393,603	No
300-49_Overburden	non-Rad	4-Chloro-3-methylphenol	59-50-7	µg/kg	46	1.87E+08	No
300-49_Overburden	non-Rad	Acenaphthene	83-32-9	µg/kg	31	4.94E+07	No
300-49_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.30E+06	--[b]	--
300-49_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	232	252,032	No
300-49_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,008	--[b]	--
300-49_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,291	11,726	No
300-49_Overburden	non-Rad	Barium	7440-39-3	µg/kg	76,068	--[b]	--
300-49_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	201	--[b]	--
300-49_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	174	176,066	No
300-49_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	18,106	--[b]	--
300-49_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,127	--[b]	--
300-49_Overburden	non-Rad	Copper	7440-50-8	µg/kg	536,000	3.40E+06	No
300-49_Overburden	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	52	3.56E+07	No
300-49_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.08E+07	1.43E+08	No
300-49_Overburden	non-Rad	Lead	7439-92-1	µg/kg	36,964	1.48E+06	No
300-49_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	316,669	--[b]	--
300-49_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	13,035	--[b]	--
300-49_Overburden	non-Rad	n-Nitrosodi-n-dipropylamine	621-64-7	µg/kg	40	330	No
300-49_Overburden	non-Rad	Pentachlorophenol	87-86-5	µg/kg	50	1,980	No
300-49_Overburden	non-Rad	Phenol	108-95-2	µg/kg	50	6.21E+06	No
300-49_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	40	--[b]	--
300-49_Overburden	non-Rad	Silver	7440-22-4	µg/kg	703	--[b]	--
300-49_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,066	2.64E+06[c]	No
300-49_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	50,380	--[e]	--
300-49_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	141,984	6.41E+07	No
300-49_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	1.0	--[d]	--
300-49_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.057	--[d]	--
300-49_Overburden	Rad	Uranium-238	U-238	pCi/g	1.0	--[d]	--
300-49_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.92E+06	--[b]	--
300-49_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	176	252,032	No
300-49_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,431	11,726	No
300-49_Shallow	non-Rad	Barium	7440-39-3	µg/kg	89,874	--[b]	--
300-49_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	303	--[b]	--
300-49_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,170	--[b]	--
300-49_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,323	--[b]	--
300-49_Shallow	non-Rad	Copper	7440-50-8	µg/kg	14,870	3.40E+06	No
300-49_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.59E+07	1.43E+08	No
300-49_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,629	1.48E+06	No
300-49_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	361,805	--[b]	--
300-49_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	10,664	--[b]	--
300-49_Shallow	non-Rad	Silver	7440-22-4	µg/kg	621	--[b]	--
300-49_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,983	2.64E+06[c]	No
300-49_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	58,672	--[e]	--
300-49_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	54,651	6.41E+07	No
300-49_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.15	--[b]	--
300-49_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
300-49_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
300-49_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
300-50_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.68E+06	--[b]	--
300-50_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	33	--[b]	--
300-50_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	229	--[b]	--
300-50_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	6,897	11,726	No

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300-50_Overburden	non-Rad	Barium	7440-39-3	µg/kg	117,742	--[b]	--
300-50_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	325	--[b]	--
300-50_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	563	176,066	No
300-50_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	12,197	--[b]	--
300-50_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	9,389	--[b]	--
300-50_Overburden	non-Rad	Copper	7440-50-8	µg/kg	64,527	3.40E+06	No
300-50_Overburden	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07	1.43E+08	No
300-50_Overburden	non-Rad	Lead	7439-92-1	µg/kg	5,905	1.48E+06	No
300-50_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	314,271	--[b]	--
300-50_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	15,229	--[b]	--
300-50_Overburden	non-Rad	Silver	7440-22-4	µg/kg	1,202	--[b]	--
300-50_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	17,919	2.64E+06[c]	No
300-50_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	45,243	--[e]	--
300-50_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	45,889	6.41E+07	No
300-50_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.056	--[b]	--
300-50_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	6.0	--[d]	--
300-50_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.45	--[d]	--
300-50_Overburden	Rad	Uranium-238	U-238	pCi/g	6.0	--[d]	--
300-50_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.88E+06	--[b]	--
300-50_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	3,000	252,032	No
300-50_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	126	--[b]	--
300-50_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,403	11,726	No
300-50_Shallow	non-Rad	Barium	7440-39-3	µg/kg	103,029	--[b]	--
300-50_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	282	--[b]	--
300-50_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	19	--[b]	--
300-50_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	463	176,066	No
300-50_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	16,841	--[b]	--
300-50_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,109	--[b]	--
300-50_Shallow	non-Rad	Copper	7440-50-8	µg/kg	16,820	3.40E+06	No
300-50_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	1.43E+08	No
300-50_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,381	1.48E+06	No
300-50_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	318,120	--[b]	--
300-50_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,413	--[b]	--
300-50_Shallow	non-Rad	Silver	7440-22-4	µg/kg	2,992	--[b]	--
300-50_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	22,938	2.64E+06[c]	No
300-50_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	46,964	--[e]	--
300-50_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,344	6.41E+07	No
300-50_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.056	--[b]	--
300-50_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	7.9	--[d]	--
300-50_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.66	--[d]	--
300-50_Shallow	Rad	Uranium-238	U-238	pCi/g	8.4	--[d]	--
300-8_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	574	--[b]	--
300-8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,374	2.64E+06[c]	No
300-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.79	--[d]	--
300-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.82	--[d]	--
316-1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	40,572	2.64E+06[c]	No
316-1_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.10	--[b]	--
316-1_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.32	--[b]	--
316-1_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	13	--[d]	--
316-1_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
316-1_Overburden	Rad	Uranium-238	U-238	pCi/g	13	--[d]	--
316-1_Shallow_1	non-Rad	Aroclor-1248	12672-29-6	µg/kg	3,000	133	Yes
316-1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	19,014	11,726	Yes
316-1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	69	--[b]	--
316-1_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	98	1.50E+06	No
316-1_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	83,027	2.64E+06[c]	No
316-1_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.032	--[b]	--
316-1_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.2	--[d]	--
316-1_Shallow_1	Rad	Uranium-238	U-238	pCi/g	28	--[d]	--
316-1_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	1.11E+07	--[b]	--
316-1_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	490	252,032	No
316-1_Shallow_3	non-Rad	Aroclor-1254	11097-69-1	µg/kg	98	--[b]	--
316-1_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	5,138	11,726	No
316-1_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	129,106	--[b]	--
316-1_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	416	--[b]	--
316-1_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	342	--[b]	--
316-1_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	474	176,066	No
316-1_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	50,455	--[b]	--
316-1_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	9,703	--[b]	--
316-1_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	1.37E+06	3.40E+06	No
316-1_Shallow_3	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	3.2	--[b]	--
316-1_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.44E+07	1.43E+08	No
316-1_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	14,409	1.48E+06	No
316-1_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	392,825	--[b]	--
316-1_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	1,105	8,451	No
316-1_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	94,656	--[b]	--
316-1_Shallow_3	non-Rad	Phenol	108-95-2	µg/kg	28	6.21E+06	No
316-1_Shallow_3	non-Rad	Selenium	7782-49-2	µg/kg	1,444	302,457	No
316-1_Shallow_3	non-Rad	Silver	7440-22-4	µg/kg	13,196	--[b]	--
316-1_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	63,074	2.64E+06[c]	No
316-1_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	56,707	--[e]	--
316-1_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	82,016	6.41E+07	No

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
316-1_Shallow_3	Rad	Cesium-137	10045-97-3	pCi/g	0.37	--[b]	--
316-1_Shallow_3	Rad	Cobalt-60	10198-40-0	pCi/g	2.3	--[b]	--
316-1_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	23	--[d]	--
316-1_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	2.6	--[d]	--
316-1_Shallow_3	Rad	Uranium-238	U-238	pCi/g	21	--[d]	--
316-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	µg/kg	62	--[b]	--
316-1_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	42,963	2.64E+06[c]	No
316-1_Shallow_4	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--
316-1_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	16	--[d]	--
316-1_Shallow_4	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
316-1_Shallow_4	Rad	Uranium-238	U-238	pCi/g	14	--[d]	--
316-2_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	210,452	2.64E+06[c]	No
316-2_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.031	--[b]	--
316-2_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.092	--[b]	--
316-2_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	86	--[d]	--
316-2_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	12	--[d]	--
316-2_Shallow_1	Rad	Uranium-238	U-238	pCi/g	69	--[d]	--
316-2_Shallow_2	non-Rad	Aroclor-1248	12672-29-6	µg/kg	697	133	Yes
316-2_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	µg/kg	42	--[b]	--
316-2_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	110	--[b]	--
316-2_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	291,369	2.64E+06[c]	No
316-2_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	0.45	--[b]	--
316-2_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.45	--[b]	--
316-2_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	115	--[d]	--
316-2_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	11	--[d]	--
316-2_Shallow_2	Rad	Uranium-238	U-238	pCi/g	96	--[d]	--
316-2_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	8,000	11,726	No
316-2_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	260	--[b]	--
316-2_Shallow_3	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	180	1.50E+06	No
316-2_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	73,174	2.64E+06[c]	No
316-2_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.91	--[d]	--
316-2_Shallow_3	Rad	Uranium-238	U-238	pCi/g	24	--[d]	--
316-5_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	3,070	11,726	No
316-5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	38	--[b]	--
316-5_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	146	--[b]	--
316-5_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	100	1.50E+06	No
316-5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	271,835	2.64E+06[c]	No
316-5_Shallow_1	Rad	Americium-241	14596-10-2	pCi/g	0.48	--[b]	--
316-5_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	2.3	--[b]	--
316-5_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	19	--[d]	--
316-5_Shallow_1	Rad	Uranium-238	U-238	pCi/g	89	--[d]	--
316-5_Shallow_2	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	140	210	No
316-5_Shallow_2	non-Rad	2-Butoxyethanol	111-76-2	µg/kg	240	2.58E+07	No
316-5_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	3,180	11,726	No
316-5_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	76,700	--[b]	--
316-5_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	180	--[b]	--
316-5_Shallow_2	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	110	1.50E+06	No
316-5_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	6,900	--[b]	--
316-5_Shallow_2	non-Rad	Chrysene	218-01-9	µg/kg	38	--[b]	--
316-5_Shallow_2	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	146	3.56E+07	No
316-5_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	3,200	1.48E+06	No
316-5_Shallow_2	non-Rad	Selenium	7782-49-2	µg/kg	490	302,457	No
316-5_Shallow_2	non-Rad	Silver	7440-22-4	µg/kg	3,600	--[b]	--
316-5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	204,701	2.64E+06[c]	No
316-5_Shallow_2	Rad	Americium-241	14596-10-2	pCi/g	0.12	--[b]	--
316-5_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	1.7	--[b]	--
316-5_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--
316-5_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	9.0	--[d]	--
316-5_Shallow_2	Rad	Uranium-238	U-238	pCi/g	68	--[d]	--
316-5_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	57	133	No
316-5_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	70	--[b]	--
316-5_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--[b]	--
316-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,300	11,726	No
316-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	190	--[b]	--
316-5_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	1,500	3.56E+07	No
316-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	138,095	2.64E+06[c]	No
316-5_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.8	--[b]	--
316-5_Shallow_Focused	Rad	Europium-155	14391-16-3	pCi/g	0.072	--[b]	--
316-5_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	7.7	--[d]	--
316-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	45	--[d]	--
331 LSLDF_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	25	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	590	2.28E+08	No
331 LSLDF_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	0.56	148	No
331 LSLDF_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	µg/kg	0.39	53	No
331 LSLDF_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.90E+06	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	360	252,032	No
331 LSLDF_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	850	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,400	11,726	No
331 LSLDF_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	78,600	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	570	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	910	--[b]	--

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
331 LSLDF_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,700	--[e]	--
331 LSLDF_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	340	1.50E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	140	176,066	No
331 LSLDF_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,300	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,400	3.40E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Dieldrin	60-57-1	µg/kg	13	26	No
331 LSLDF_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	98	3.56E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan I	959-98-8	µg/kg	1.9	1,433	No
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	µg/kg	3.1	1,433	No
331 LSLDF_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.20E+07	1.43E+08	No
331 LSLDF_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	9,000	1.48E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	349,000	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	110	8,451	No
331 LSLDF_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	µg/kg	3.3	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	11	1,931	No
331 LSLDF_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	590	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	41,700	1.36E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	9,500	3.03E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,100	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	2,300	2.64E+06[c]	No
331 LSLDF_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	53,100	--[e]	--
331 LSLDF_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	137,000	6.41E+07	No
331 LSLDF_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	--[d]	--
331 LSLDF_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.47	--[d]	--
600-243_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	µg/kg	279	4.65E+06	No
600-243_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	31	--[b]	--
600-243_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	1,300	252,032	No
600-243_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	27	--[b]	--
600-243_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	18	--[b]	--
600-243_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,159	11,726	No
600-243_Shallow	non-Rad	Barium	7440-39-3	µg/kg	292,072	--[b]	--
600-243_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	43	--[b]	--
600-243_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	43	--[b]	--
600-243_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	46	--[b]	--
600-243_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	32	--[b]	--
600-243_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	2,079	--[b]	--
600-243_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	432	--[b]	--
600-243_Shallow	non-Rad	Boron	7440-42-8	µg/kg	294,463	--[e]	--
600-243_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	793	176,066	No
600-243_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	18,006	--[b]	--
600-243_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	63	--[b]	--
600-243_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,207	--[b]	--
600-243_Shallow	non-Rad	Copper	7440-50-8	µg/kg	53,981	3.40E+06	No
600-243_Shallow	non-Rad	Dibenzofuran	132-64-9	µg/kg	78	246,969	No
600-243_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	37	3.56E+07	No
600-243_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	79	2.82E+08	No
600-243_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	28	--[b]	--
600-243_Shallow	non-Rad	Lead	7439-92-1	µg/kg	40,139	1.48E+06	No
600-243_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	208,289	--[b]	--
600-243_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	1,869	--[b]	--
600-243_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	204	6.97E+07	No
600-243_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	21,395	--[b]	--
600-243_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	70	--[b]	--
600-243_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	5,709	302,457	No
600-243_Shallow	non-Rad	Silver	7440-22-4	µg/kg	500	--[b]	--
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	95,319	--[e]	--
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	334,524	--[e]	--
600-243_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	46,986	--[e]	--
600-243_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	84,099	6.41E+07	No
600-259_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.034	--[b]	--
600-259_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.068	--[b]	--
600-259_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.038	--[b]	--
600-47_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,300	11,726	No
600-47_Shallow	non-Rad	Barium	7440-39-3	µg/kg	67,000	--[b]	--
600-47_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	500	--[b]	--
600-47_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	90	176,066	No
600-47_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	5,500	--[b]	--
600-47_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,500	1.48E+06	No
600-47_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,303	2.64E+06[c]	No
600-47_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	--[d]	--
600-47_Shallow	Rad	Uranium-238	U-238	pCi/g	1.6	--[d]	--
618-1_Deep	non-Rad	Aluminum	7429-90-5	µg/kg	6.37E+06	--[b]	--
618-1_Deep	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,760	--[b]	--
618-1_Deep	non-Rad	Aroclor-1260	11096-82-5	µg/kg	294	--[b]	--
618-1_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,550	11,726	No
618-1_Deep	non-Rad	Barium	7440-39-3	µg/kg	299,000	--[b]	--
618-1_Deep	non-Rad	Beryllium	7440-41-7	µg/kg	218	--[b]	--
618-1_Deep	non-Rad	Boron	7440-42-8	µg/kg	1,360	--[e]	--
618-1_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	263	176,066	No
618-1_Deep	non-Rad	Chromium	7440-47-3	µg/kg	7,740	--[b]	--

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-1_Deep	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	--[b]	--
618-1_Deep	non-Rad	Copper	7440-50-8	µg/kg	46,300	3.40E+06	No
618-1_Deep	non-Rad	Fluoride	16984-48-8	µg/kg	2,800	--[b]	--
618-1_Deep	non-Rad	Iron	7439-89-6	µg/kg	2.47E+07	1.43E+08	No
618-1_Deep	non-Rad	Lead	7439-92-1	µg/kg	58,400	1.48E+06	No
618-1_Deep	non-Rad	Lithium	7439-93-2	µg/kg	5,980	--[e]	--
618-1_Deep	non-Rad	Manganese	7439-96-5	µg/kg	352,000	--[b]	--
618-1_Deep	non-Rad	Mercury	7439-97-6	µg/kg	1,180	8,451	No
618-1_Deep	non-Rad	Molybdenum	7439-98-7	µg/kg	493	--[b]	--
618-1_Deep	non-Rad	Nickel	7440-02-0	µg/kg	17,600	--[b]	--
618-1_Deep	non-Rad	Nitrate	14797-55-8	µg/kg	1,700	1.36E+07	No
618-1_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	220	3.03E+06	No
618-1_Deep	non-Rad	Uranium	7440-61-1	µg/kg	37,400	2.64E+06[c]	No
618-1_Deep	non-Rad	Vanadium	7440-62-2	µg/kg	73,000	--[e]	--
618-1_Deep	non-Rad	Zinc	7440-66-6	µg/kg	134,000	6.41E+07	No
618-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.46	--[b]	--
618-1_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	33	--[d]	--
618-1_Deep	Rad	Uranium-235	15117-96-1	pCi/g	2.7	--[d]	--
618-1_Deep	Rad	Uranium-238	U-238	pCi/g	32	--[d]	--
618-1_Deep_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.57E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	407	252,032	No
618-1_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1.24E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	99	--[b]	--
618-1_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,580	11,726	No
618-1_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	1.87E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	323	--[b]	--
618-1_Deep_Focused	non-Rad	Boron	7440-42-8	µg/kg	6,620	--[e]	--
618-1_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,030	176,066	No
618-1_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	18,900	--[b]	--
618-1_Deep_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,920	--[b]	--
618-1_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	68,700	3.40E+06	No
618-1_Deep_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	3,300	--[b]	--
618-1_Deep_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.41E+07	1.43E+08	No
618-1_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	333,000	1.48E+06	No
618-1_Deep_Focused	non-Rad	Lithium	7439-93-2	µg/kg	8,450	--[e]	--
618-1_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	351,000	--[b]	--
618-1_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	8,940	8,451	Yes
618-1_Deep_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	2,140	--[b]	--
618-1_Deep_Focused	non-Rad	Nickel	7440-02-0	µg/kg	13,700	--[b]	--
618-1_Deep_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	11,900	1.36E+07	No
618-1_Deep_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,560	3.03E+06	No
618-1_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,290	--[b]	--
618-1_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	209,000	2.64E+06[c]	No
618-1_Deep_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	70,900	--[e]	--
618-1_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	82,000	6.41E+07	No
618-1_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	6.5	--[b]	--
618-1_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	70	--[d]	--
618-1_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.5	--[d]	--
618-1_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	65	--[d]	--
618-1_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.21E+06	--[b]	--
618-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	264	--[b]	--
618-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	54	--[b]	--
618-1_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,280	11,726	No
618-1_Shallow	non-Rad	Barium	7440-39-3	µg/kg	97,200	--[b]	--
618-1_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	188	--[b]	--
618-1_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,190	--[e]	--
618-1_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	68	176,066	No
618-1_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,930	--[b]	--
618-1_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,360	--[b]	--
618-1_Shallow	non-Rad	Copper	7440-50-8	µg/kg	11,400	3.40E+06	No
618-1_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	400	--[b]	--
618-1_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07	1.43E+08	No
618-1_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,100	1.48E+06	No
618-1_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	6,380	--[e]	--
618-1_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	300,000	--[b]	--
618-1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	31	8,451	No
618-1_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	336	--[b]	--
618-1_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,150	--[b]	--
618-1_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	1,600	1.36E+07	No
618-1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	300	3.03E+06	No
618-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,224	2.64E+06[c]	No
618-1_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	56,300	--[e]	--
618-1_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	42,100	6.41E+07	No
618-1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	--[d]	--
618-1_Shallow	Rad	Uranium-238	U-238	pCi/g	1.5	--[d]	--
618-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	1.22E+07	--[b]	--
618-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	455	252,032	No
618-1_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	35	133	No
618-1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	981	--[b]	--
618-1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	56	--[b]	--
618-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	6,090	11,726	No
618-1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	102,000	--[b]	--

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	371	--[b]	--
618-1_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	3,740	--[e]	--
618-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	266	176,066	No
618-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	19,500	--[b]	--
618-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	--[b]	--
618-1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	23,800	3.40E+06	No
618-1_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	900	--[b]	--
618-1_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.28E+07	1.43E+08	No
618-1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,210	1.48E+06	No
618-1_Shallow_Focused	non-Rad	Lithium	7439-93-2	µg/kg	13,300	--[e]	--
618-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	403,000	--[b]	--
618-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	198	8,451	No
618-1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	356	--[b]	--
618-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	16,800	--[b]	--
618-1_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	3,800	1.36E+07	No
618-1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	260	3.03E+06	No
618-1_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,120	--[b]	--
618-1_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	7,080	2.64E+06[c]	No
618-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	64,700	--[e]	--
618-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	68,100	6.41E+07	No
618-1_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-1_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.99	--[d]	--
618-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	8.2	--[d]	--
618-12_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	8,557	11,726	No
618-12_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	63	--[b]	--
618-12_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	60	1.50E+06	No
618-12_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	32,092	2.64E+06[c]	No
618-12_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.47	--[d]	--
618-12_Shallow	Rad	Uranium-238	U-238	pCi/g	11	--[d]	--
618-13_Shallow	non-Rad	Acetone	67-64-1	µg/kg	8.6	2.28E+08	No
618-13_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.34E+06	--[b]	--
618-13_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	312	252,032	No
618-13_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,500	11,726	No
618-13_Shallow	non-Rad	Barium	7440-39-3	µg/kg	74,000	--[b]	--
618-13_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	212	--[b]	--
618-13_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,050	--[e]	--
618-13_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	63	176,066	No
618-13_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,700	--[b]	--
618-13_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,290	--[b]	--
618-13_Shallow	non-Rad	Copper	7440-50-8	µg/kg	11,500	3.40E+06	No
618-13_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.01E+07	1.43E+08	No
618-13_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,620	1.48E+06	No
618-13_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	344,000	--[b]	--
618-13_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	5.1	1,931	No
618-13_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	420	--[b]	--
618-13_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,400	--[b]	--
618-13_Shallow	non-Rad	Tin	7440-31-5	µg/kg	1,050	--[b]	--
618-13_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,750	2.64E+06[c]	No
618-13_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	55,800	--[e]	--
618-13_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,400	6.41E+07	No
618-13_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.038	--[b]	--
618-13_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	--[d]	--
618-13_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
618-13_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	5.9	2.28E+08	No
618-13_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.22E+06	--[b]	--
618-13_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	233	252,032	No
618-13_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,390	11,726	No
618-13_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	57,700	--[b]	--
618-13_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	184	--[b]	--
618-13_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	960	--[e]	--
618-13_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	47	176,066	No
618-13_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,740	--[b]	--
618-13_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,710	--[b]	--
618-13_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,100	3.40E+06	No
618-13_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	150	6,000[f]	No
618-13_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.79E+07	1.43E+08	No
618-13_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	4,940	1.48E+06	No
618-13_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	268,000	--[b]	--
618-13_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	5.0	1,931	No
618-13_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	297	--[b]	--
618-13_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000	--[b]	--
618-13_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	745	--[b]	--
618-13_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	1,500	2.64E+06[c]	No
618-13_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	48,600	--[e]	--
618-13_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	37,100	6.41E+07	No
618-13_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
618-13_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.96	--[d]	--
618-2_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	1,500	11,726	No
618-2_Deep	non-Rad	Barium	7440-39-3	µg/kg	83,300	--[b]	--
618-2_Deep	non-Rad	Chromium	7440-47-3	µg/kg	6,700	--[b]	--
618-2_Deep	non-Rad	Lead	7439-92-1	µg/kg	6,600	1.48E+06	No
618-2_Deep	non-Rad	Selenium	7782-49-2	µg/kg	780	302,457	No

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-2_Deep	non-Rad	Tin	7440-31-5	µg/kg	2,900	--[b]	--
618-2_Deep	non-Rad	Uranium	7440-61-1	µg/kg	501,000	2.64E+06[c]	No
618-2_Deep	Rad	Americium-241	14596-10-2	pCi/g	7.9	--[b]	--
618-2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	1.0	--[b]	--
618-2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	1.5	--[b]	--
618-2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	91	--[b]	--
618-2_Deep	Rad	Plutonium-241	14119-32-5	pCi/g	42	--[b]	--
618-2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	12	227,428	No
618-2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	161	--[d]	--
618-2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.78	--[d]	--
618-2_Deep	Rad	Uranium-238	U-238	pCi/g	165	--[d]	--
618-2_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	6.9	--[b]	--
618-2_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,300	11,726	No
618-2_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	109,000	--[b]	--
618-2_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	27	--[b]	--
618-2_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	200	176,066	No
618-2_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,400	--[b]	--
618-2_Deep_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	18	3.56E+07	No
618-2_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,800	1.48E+06	No
618-2_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	1,200	302,457	No
618-2_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	600	--[b]	--
618-2_Deep_Focused	non-Rad	Tin	7440-31-5	µg/kg	42,500	--[b]	--
618-2_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	148,000	2.64E+06[c]	No
618-2_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	9.2	--[b]	--
618-2_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.1	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-238	13981-16-3	pCi/g	1.6	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	92	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-241	14119-32-5	pCi/g	33	--[b]	--
618-2_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	7.2	227,428	No
618-2_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	48	--[d]	--
618-2_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	2.4	--[d]	--
618-2_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	50	--[d]	--
618-2_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	11,726	No
618-2_Overburden	non-Rad	Barium	7440-39-3	µg/kg	74,700	--[b]	--
618-2_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	6,600	--[b]	--
618-2_Overburden	non-Rad	Lead	7439-92-1	µg/kg	4,300	1.48E+06	No
618-2_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	1,000	302,457	No
618-2_Overburden	non-Rad	Tin	7440-31-5	µg/kg	2,700	--[b]	--
618-2_Overburden	non-Rad	Uranium	7440-61-1	µg/kg	1,140	2.64E+06[c]	No
618-2_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.058	--[b]	--
618-2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.64	--[d]	--
618-2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.59	--[d]	--
618-2_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	1,900	11,726	No
618-2_Shallow	non-Rad	Barium	7440-39-3	µg/kg	79,100	--[b]	--
618-2_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,100	--[b]	--
618-2_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,600	1.48E+06	No
618-2_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	760	302,457	No
618-2_Shallow	non-Rad	Tin	7440-31-5	µg/kg	2,400	--[b]	--
618-2_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	4,530	2.64E+06[c]	No
618-2_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.81	--[b]	--
618-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.2	--[b]	--
618-2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	7.7	--[b]	--
618-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.2	--[d]	--
618-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.21	--[d]	--
618-2_Shallow	Rad	Uranium-238	U-238	pCi/g	2.2	--[d]	--
618-2_Staging Pile	non-Rad	Arsenic	7440-38-2	µg/kg	3,063	11,726	No
618-2_Staging Pile	non-Rad	Barium	7440-39-3	µg/kg	67,690	--[b]	--
618-2_Staging Pile	non-Rad	Chromium	7440-47-3	µg/kg	6,424	--[b]	--
618-2_Staging Pile	non-Rad	Lead	7439-92-1	µg/kg	4,011	1.48E+06	No
618-2_Staging Pile	non-Rad	Uranium	7440-61-1	µg/kg	5,022	2.64E+06[c]	No
618-2_Staging Pile	Rad	Americium-241	14596-10-2	pCi/g	0.82	--[b]	--
618-2_Staging Pile	Rad	Cesium-137	10045-97-3	pCi/g	0.095	--[b]	--
618-2_Staging Pile	Rad	Plutonium-239/240	PU-239/240	pCi/g	10	--[b]	--
618-2_Staging Pile	Rad	Tritium	10028-17-8	pCi/g	2.3	9,176	No
618-2_Staging Pile	Rad	Uranium-233/234	U-233/234	pCi/g	2.0	--[d]	--
618-2_Staging Pile	Rad	Uranium-235	15117-96-1	pCi/g	0.12	--[d]	--
618-2_Staging Pile	Rad	Uranium-238	U-238	pCi/g	2.0	--[d]	--
618-3_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,800	11,726	No
618-3_Shallow	non-Rad	Barium	7440-39-3	µg/kg	76,500	--[b]	--
618-3_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,700	--[b]	--
618-3_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,900	1.48E+06	No
618-3_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	659	302,457	No
618-3_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,610	2.64E+06[c]	No
618-3_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.68	--[d]	--
618-3_Shallow	Rad	Uranium-238	U-238	pCi/g	0.75	--[d]	--
618-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	238,577	2.64E+06[c]	No
618-3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	80	--[d]	--
618-3_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.8	--[d]	--
618-3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	79	--[d]	--
618-4_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,200	11,726	No
618-4_Deep	non-Rad	Lead	7439-92-1	µg/kg	20,000	1.48E+06	No

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	64,506	2.64E+06[c]	No
618-4_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	20	--[d]	--
618-4_Deep	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
618-4_Deep	Rad	Uranium-238	U-238	pCi/g	22	--[d]	--
618-4_Deep_Focused	non-Rad	2-Butanone	78-93-3	µg/kg	130	1.71E+08	No
618-4_Deep_Focused	non-Rad	Acetone	67-64-1	µg/kg	16	2.28E+08	No
618-4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,600	--[b]	--
618-4_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	11,726	No
618-4_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	104,000	--[b]	--
618-4_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	4,700	--[b]	--
618-4_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,500	176,066	No
618-4_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	27,700	--[b]	--
618-4_Deep_Focused	non-Rad	Diethyl ether	60-29-7	µg/kg	1.0	3.98E+07	No
618-4_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	24,900	1.48E+06	No
618-4_Deep_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	40	1,931	No
618-4_Deep_Focused	non-Rad	Phenol	108-95-2	µg/kg	110	6.21E+06	No
618-4_Deep_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	24	1,316	No
618-4_Deep_Focused	non-Rad	Toluene	108-88-3	µg/kg	4.8	2.35E+06	No
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	34,000	--[e]	--
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - kerosene range	TPHKEROSENE	µg/kg	42,000	--[e]	--
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	65	--[e]	--
618-4_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	20,777	2.64E+06[c]	No
618-4_Deep_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	3,511	No
618-4_Deep_Focused	non-Rad	Trichloromonofluoromethane	75-69-4	µg/kg	12	2.90E+07	No
618-4_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	7.2	--[d]	--
618-4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.51	--[d]	--
618-4_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	6.9	--[d]	--
618-4_Overburden_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,500	11,726	No
618-4_Overburden_2	non-Rad	Lead	7439-92-1	µg/kg	4,700	1.48E+06	No
618-4_Overburden_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,197	2.64E+06[c]	No
618-4_Overburden_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
618-4_Overburden_2	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
618-4_Overburden_3	non-Rad	Lead	7439-92-1	µg/kg	5,000	1.48E+06	No
618-4_Overburden_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,171	2.64E+06[c]	No
618-4_Overburden_3	Rad	Uranium-233/234	U-233/234	pCi/g	0.42	--[d]	--
618-4_Overburden_3	Rad	Uranium-235	15117-96-1	pCi/g	0.032	--[d]	--
618-4_Overburden_3	Rad	Uranium-238	U-238	pCi/g	0.44	--[d]	--
618-4_Overburden_4	non-Rad	Lead	7439-92-1	µg/kg	4,800	1.48E+06	No
618-4_Overburden_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,323	2.64E+06[c]	No
618-4_Overburden_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.94	--[d]	--
618-4_Overburden_4	Rad	Uranium-238	U-238	pCi/g	0.94	--[d]	--
618-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,200	11,726	No
618-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	49,000	1.48E+06	No
618-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	7,456	2.64E+06[c]	No
618-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	3.2	--[d]	--
618-4_Shallow	Rad	Uranium-238	U-238	pCi/g	3.1	--[d]	--
618-5_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	5,200	11,726	No
618-5_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	470	176,066	No
618-5_Deep	non-Rad	Chromium	7440-47-3	µg/kg	14,700	--[b]	--
618-5_Deep	non-Rad	Lead	7439-92-1	µg/kg	82,300	1.48E+06	No
618-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	26,618	2.64E+06[c]	No
618-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	8.6	--[d]	--
618-5_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.46	--[d]	--
618-5_Deep	Rad	Uranium-238	U-238	pCi/g	8.9	--[d]	--
618-5_Deep_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.65E+06	--[b]	--
618-5_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	1,800	252,032	No
618-5_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,500	11,726	No
618-5_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	106,000	--[b]	--
618-5_Deep_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	672	--[b]	--
618-5_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,500	--[b]	--
618-5_Deep_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	10,500	--[b]	--
618-5_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	21,400	3.40E+06	No
618-5_Deep_Focused	non-Rad	Iron	7439-89-6	µg/kg	3.02E+07	1.43E+08	No
618-5_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,600	1.48E+06	No
618-5_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	579,000	--[b]	--
618-5_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	33	8,451	No
618-5_Deep_Focused	non-Rad	Nickel	7440-02-0	µg/kg	11,300	--[b]	--
618-5_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	2,270	302,457	No
618-5_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	36,540	2.64E+06[c]	No
618-5_Deep_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	79,500	--[e]	--
618-5_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	65,800	6.41E+07	No
618-5_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-5_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.48	--[d]	--
618-5_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	12	--[d]	--
618-5_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,400	11,726	No
618-5_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	170	176,066	No
618-5_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	9,700	--[b]	--
618-5_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,500	1.48E+06	No
618-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	9,773	2.64E+06[c]	No
618-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	4.1	--[d]	--
618-5_Overburden	Rad	Uranium-238	U-238	pCi/g	4.6	--[d]	--
618-5_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,300	11,726	No
618-5_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,300	--[b]	--

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-5_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,100	1.48E+06	No
618-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,849	2.64E+06[c]	No
618-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.94	--[d]	--
618-5_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
618-5_Staging Pile_4	non-Rad	Arsenic	7440-38-2	µg/kg	3,300	11,726	No
618-5_Staging Pile_4	non-Rad	Cadmium	7440-43-9	µg/kg	50	176,066	No
618-5_Staging Pile_4	non-Rad	Chromium	7440-47-3	µg/kg	11,800	--[b]	--
618-5_Staging Pile_4	non-Rad	Lead	7439-92-1	µg/kg	5,300	1.48E+06	No
618-5_Staging Pile_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,364	2.64E+06[c]	No
618-5_Staging Pile_4	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	--[d]	--
618-5_Staging Pile_4	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
618-5_Staging Pile_5	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	11,726	No
618-5_Staging Pile_5	non-Rad	Chromium	7440-47-3	µg/kg	10,300	--[b]	--
618-5_Staging Pile_5	non-Rad	Lead	7439-92-1	µg/kg	3,900	1.48E+06	No
618-5_Staging Pile_5	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,326	2.64E+06[c]	No
618-5_Staging Pile_5	Rad	Uranium-233/234	U-233/234	pCi/g	1.5	--[d]	--
618-5_Staging Pile_5	Rad	Uranium-235	15117-96-1	pCi/g	0.17	--[d]	--
618-5_Staging Pile_5	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
618-7_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	5.25E+06	--[b]	--
618-7_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	560	252,032	No
618-7_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	1,891	11,726	No
618-7_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	68,874	--[b]	--
618-7_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	278	--[b]	--
618-7_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	65	176,066	No
618-7_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	10,227	--[b]	--
618-7_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	9,152	--[b]	--
618-7_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	16,120	3.40E+06	No
618-7_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	2.60E+07	1.43E+08	No
618-7_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	14,567	1.48E+06	No
618-7_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	326,067	--[b]	--
618-7_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	44	8,451	No
618-7_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	20,977	--[b]	--
618-7_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,547	--[b]	--
618-7_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	10,814	2.64E+06[c]	No
618-7_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	74,576	--[e]	--
618-7_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	49,177	6.41E+07	No
618-7_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.067	--[b]	--
618-7_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	3.6	--[d]	--
618-7_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	0.36	--[d]	--
618-7_Shallow_1	Rad	Uranium-238	U-238	pCi/g	3.6	--[d]	--
618-7_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	4.97E+06	--[b]	--
618-7_Shallow_2	non-Rad	Antimony	7440-36-0	µg/kg	660	252,032	No
618-7_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,500	11,726	No
618-7_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	73,800	--[b]	--
618-7_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	440	--[b]	--
618-7_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	6,800	--[b]	--
618-7_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	9,300	--[b]	--
618-7_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	13,600	3.40E+06	No
618-7_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	2.60E+07	1.43E+08	No
618-7_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	2,800	1.48E+06	No
618-7_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	364,000	--[b]	--
618-7_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	20	8,451	No
618-7_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	9,700	--[b]	--
618-7_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,500	--[b]	--
618-7_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,574	2.64E+06[c]	No
618-7_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	74,700	--[e]	--
618-7_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	46,200	6.41E+07	No
618-7_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.57	--[d]	--
618-7_Shallow_2	Rad	Uranium-238	U-238	pCi/g	0.53	--[d]	--
618-7_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	6.74E+06	--[b]	--
618-7_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	450	252,032	No
618-7_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	2,800	11,726	No
618-7_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	82,500	--[b]	--
618-7_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	310	--[b]	--
618-7_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	190	176,066	No
618-7_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	10,100	--[b]	--
618-7_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	--[b]	--
618-7_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	13,600	3.40E+06	No
618-7_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.43E+07	1.43E+08	No
618-7_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	4,300	1.48E+06	No
618-7_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	357,000	--[b]	--
618-7_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	20	8,451	No
618-7_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	10,100	--[b]	--
618-7_Shallow_3	non-Rad	Tin	7440-31-5	µg/kg	1,800	--[b]	--
618-7_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,852	2.64E+06[c]	No
618-7_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	68,200	--[e]	--
618-7_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	44,500	6.41E+07	No
618-7_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
618-7_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.085	--[d]	--
618-7_Shallow_3	Rad	Uranium-238	U-238	pCi/g	0.95	--[d]	--
618-7_Shallow_4	non-Rad	Aluminum	7429-90-5	µg/kg	5.65E+06	--[b]	--
618-7_Shallow_4	non-Rad	Antimony	7440-36-0	µg/kg	250	252,032	No

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-7_Shallow_4	non-Rad	Arsenic	7440-38-2	µg/kg	5,200	11,726	No
618-7_Shallow_4	non-Rad	Barium	7440-39-3	µg/kg	57,900	--[b]	--
618-7_Shallow_4	non-Rad	Beryllium	7440-41-7	µg/kg	220	--[b]	--
618-7_Shallow_4	non-Rad	Cadmium	7440-43-9	µg/kg	90	176,066	No
618-7_Shallow_4	non-Rad	Chromium	7440-47-3	µg/kg	11,400	--[b]	--
618-7_Shallow_4	non-Rad	Cobalt	7440-48-4	µg/kg	6,700	--[b]	--
618-7_Shallow_4	non-Rad	Copper	7440-50-8	µg/kg	13,200	3.40E+06	No
618-7_Shallow_4	non-Rad	Iron	7439-89-6	µg/kg	2.12E+07	1.43E+08	No
618-7_Shallow_4	non-Rad	Lead	7439-92-1	µg/kg	3,000	1.48E+06	No
618-7_Shallow_4	non-Rad	Manganese	7439-96-5	µg/kg	285,000	--[b]	--
618-7_Shallow_4	non-Rad	Nickel	7440-02-0	µg/kg	12,900	--[b]	--
618-7_Shallow_4	non-Rad	Tin	7440-31-5	µg/kg	710	--[b]	--
618-7_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,064	2.64E+06[c]	No
618-7_Shallow_4	non-Rad	Vanadium	7440-62-2	µg/kg	54,800	--[e]	--
618-7_Shallow_4	non-Rad	Zinc	7440-66-6	µg/kg	37,000	6.41E+07	No
618-7_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.69	--[d]	--
618-7_Shallow_4	Rad	Uranium-238	U-238	pCi/g	0.76	--[d]	--
618-7_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	150	4.94E+07	No
618-7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.61E+06	--[b]	--
618-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	980	252,032	No
618-7_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	6.7	133	No
618-7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,200	11,726	No
618-7_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	92,800	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	88	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	66	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	52	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	11	--[b]	--
618-7_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	370	--[b]	--
618-7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	470	--[b]	--
618-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	6,200	176,066	No
618-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	65,900	--[b]	--
618-7_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	69	--[b]	--
618-7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,000	--[b]	--
618-7_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	25,000	3.40E+06	No
618-7_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	45	--[b]	--
618-7_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	33	3.56E+07	No
618-7_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	48	2.82E+08	No
618-7_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.87E+07	1.43E+08	No
618-7_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,500	1.48E+06	No
618-7_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	425,000	--[b]	--
618-7_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	20	8,451	No
618-7_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	17,200	--[b]	--
618-7_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	410	--[b]	--
618-7_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,200	--[b]	--
618-7_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	680,000	--[e]	--
618-7_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	19,563	2.64E+06[c]	No
618-7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	80,500	--[e]	--
618-7_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	52,400	6.41E+07	No
618-7_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.010	--[b]	--
618-7_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-7_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.97	--[d]	--
618-7_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	6.4	--[d]	--
618-8_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,100	11,726	No
618-8_Shallow	non-Rad	Barium	7440-39-3	µg/kg	97,600	--[b]	--
618-8_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	12,400	--[b]	--
618-8_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,100	1.48E+06	No
618-8_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	846	302,457	No
618-8_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,720	2.64E+06[c]	No
618-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	--[d]	--
618-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.73	--[d]	--
618-9_Shallow_Focused	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	110	210	No
618-9_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	680	2.28E+08	No
618-9_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	390	148	Yes
618-9_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.57E+06	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1016	12674-11-2	µg/kg	1,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1221	11104-28-2	µg/kg	1,900	17	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1232	11141-16-5	µg/kg	1,900	17	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1242	53469-21-9	µg/kg	1,900	143	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,900	133	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	11,600	11,726	No
618-9_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	90,200	--[b]	--
618-9_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	330	--[b]	--
618-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	5,200	--[b]	--
618-9_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	2,700	1.50E+06	No
618-9_Shallow_Focused	non-Rad	Chlordane	57-74-9	µg/kg	69	--[b]	--
618-9_Shallow_Focused	non-Rad	Chloroform	67-66-3	µg/kg	9.0	5,207	No
618-9_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,700	--[b]	--
618-9_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,400	--[b]	--
618-9_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	16,700	3.40E+06	No
618-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	7,200	3.56E+07	No
618-9_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	44	--[b]	--

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-9_Shallow_Focused	non-Rad	Hexachlorobutadiene	87-68-3	µg/kg	760	--[b]	--
618-9_Shallow_Focused	non-Rad	Hexachloroethane	67-72-1	µg/kg	17,000	29,166	No
618-9_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.49E+07	1.43E+08	No
618-9_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	7,700	1.48E+06	No
618-9_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	359,000	--[b]	--
618-9_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	330	8,451	No
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	1,931	Yes
618-9_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,600	--[b]	--
618-9_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	1.67E+06	1.36E+07	No
618-9_Shallow_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	920	1,316	No
618-9_Shallow_Focused	non-Rad	Toluene	108-88-3	µg/kg	9.0	2.35E+06	No
618-9_Shallow_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	3,511	No
618-9_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	3,100	2.64E+06[c]	No
618-9_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	59,300	--[e]	--
618-9_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	52,300	6.41E+07	No
618-9_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.071	--[d]	--
618-9_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	3.0	--[d]	--
628-4_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,374	11,726	No
628-4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	61	--[b]	--
628-4_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,284	1.48E+06	No
628-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,308	2.64E+06[c]	No
628-4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.033	--[b]	--
628-4_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.87	--[d]	--
628-4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.78	--[d]	--
628-4_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	42	143	No
628-4_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,115	133	Yes
628-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	243	--[b]	--
628-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	38	--[b]	--
628-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,864	11,726	No
628-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	99,167	1.48E+06	No
628-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,163	2.64E+06[c]	No
628-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
628-4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.11	--[d]	--
628-4_Shallow	Rad	Uranium-238	U-238	pCi/g	1.0	--[d]	--
UPR-300-17_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	117	4.94E+07	No
UPR-300-17_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.34E+06	--[b]	--
UPR-300-17_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	7.0	--[b]	--
UPR-300-17_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	359	252,032	No
UPR-300-17_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,970	133	Yes
UPR-300-17_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	450	--[b]	--
UPR-300-17_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	113	--[b]	--
UPR-300-17_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,573	11,726	No
UPR-300-17_Shallow	non-Rad	Barium	7440-39-3	µg/kg	81,014	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	59	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	44	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	33	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	9.9	--[b]	--
UPR-300-17_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	240	--[b]	--
UPR-300-17_Shallow	non-Rad	Boron	7440-42-8	µg/kg	3,903	--[e]	--
UPR-300-17_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	173	176,066	No
UPR-300-17_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	13,795	--[b]	--
UPR-300-17_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	39	--[b]	--
UPR-300-17_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,688	--[b]	--
UPR-300-17_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,135	3.40E+06	No
UPR-300-17_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	35	2.82E+08	No
UPR-300-17_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.9	1.06E+08	No
UPR-300-17_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	5.9	--[b]	--
UPR-300-17_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07	1.43E+08	No
UPR-300-17_Shallow	non-Rad	Lead	7439-92-1	µg/kg	11,240	1.48E+06	No
UPR-300-17_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	285,159	--[b]	--
UPR-300-17_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	69	8,451	No
UPR-300-17_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	412	--[b]	--
UPR-300-17_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	48	6.97E+07	No
UPR-300-17_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	563,654	--[b]	--
UPR-300-17_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	34	--[b]	--
UPR-300-17_Shallow	non-Rad	Silver	7440-22-4	µg/kg	340	--[b]	--
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,950	--[e]	--
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	210,420	--[e]	--
UPR-300-17_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,420	2.64E+06[c]	No
UPR-300-17_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	52,150	--[e]	--
UPR-300-17_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	157,172	6.41E+07	No
UPR-300-17_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	6.1	--[d]	--
UPR-300-17_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.91	--[d]	--
UPR-300-17_Shallow	Rad	Uranium-238	U-238	pCi/g	4.0	--[d]	--
UPR-300-46_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	13	4.94E+07	No
UPR-300-46_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.80E+06	--[b]	--
UPR-300-46_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	381	252,032	No
UPR-300-46_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	879	133	Yes
UPR-300-46_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	490	--[b]	--
UPR-300-46_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	84	--[b]	--
UPR-300-46_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,846	11,726	No
UPR-300-46_Shallow	non-Rad	Barium	7440-39-3	µg/kg	82,137	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	3.9	--[b]	--

Table A-2. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
UPR-300-46_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	5.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.8	--[b]	--
UPR-300-46_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	222	--[b]	--
UPR-300-46_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,714	--[e]	--
UPR-300-46_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	95	176,066	No
UPR-300-46_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,173	--[b]	--
UPR-300-46_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	5.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,361	--[b]	--
UPR-300-46_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,151	3.40E+06	No
UPR-300-46_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	1.3	--[b]	--
UPR-300-46_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	9.6	2.82E+08	No
UPR-300-46_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.2	1.06E+08	No
UPR-300-46_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	7.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07	1.43E+08	No
UPR-300-46_Shallow	non-Rad	Lead	7439-92-1	µg/kg	7,105	1.48E+06	No
UPR-300-46_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	311,001	--[b]	--
UPR-300-46_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	29	8,451	No
UPR-300-46_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	456	--[b]	--
UPR-300-46_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	36	6.97E+07	No
UPR-300-46_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,230	--[b]	--
UPR-300-46_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	4.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,897	2.64E+06[c]	No
UPR-300-46_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	53,808	--[e]	--
UPR-300-46_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	47,945	6.41E+07	No
UPR-300-46_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.070	--[b]	--
UPR-300-46_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.8	--[d]	--
UPR-300-46_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
UPR-300-46_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--

Notes:

a. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd ≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

b. The calculated soil screening level for the analyte is considered non-representative because: (1) breakthrough is simulated within 1,000 years for some soil columns while other soil columns (a majority) show no breakthrough (breakthrough defined as concentrations below 1E-04 µg/L or activity below 1E-04 pCi/L), and/or (2) the calculated residual mass of contaminant in the pore volume is high enough to represent a substantial (and physically improbable) reduction in porosity.

c. Due to the complex geochemistry of uranium in 300 Area source operable unit soils, uranium SSLs were derived using a site-speicific two-dimensional model as described in ECF-300FF5-11-0151.

d. Uranium isotopes are accounted for by converting from activity-based (pCi/g) to mass-based (µg/kg) concentrations and then summing to provide a mass-based total uranium exposure point concentration (identified as Total_U_Isotopes), as described in ECF-300NPL-11-0137, Computation of Exposure Point Concentrations for the 300-FF-2 Source Operable Unit.

e. A soil screening level is not calculated because a surface water cleanup level or surface water standard is not available for the analyte.

f. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

-- = Not applicable or no value

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
300 ASH PITS_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	52	--	--
300 ASH PITS_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,078	6,470	No
300 ASH PITS_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	96	--	--
300 ASH PITS_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	76	--	--
300 ASH PITS_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,450	3,210	No
300 ASH PITS_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.039	0.11	No
300 ASH PITS_Shallow	Rad	Uranium-238	U-238	pCi/g	0.82	1.1	No
300 VTS_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.029	1.1	No
300-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	13,500	6,470	Yes
300-10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	200	--	--
300-10_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	230	--	--
300-10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,078	3,210	Yes
300-10_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.16	1.1	No
300-10_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.041	0.11	No
300-10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	1.1	Yes
300-109_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.62E+06	1.18E+07	No
300-109_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	122	--	--
300-109_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	40	--	--
300-109_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,420	6,470	No
300-109_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	63,300	132,000	No
300-109_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.2	--	--
300-109_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	2.3	--	--
300-109_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	180	1,510	No
300-109_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	632	3,890	No
300-109_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	59	563	No
300-109_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,950	18,500	No
300-109_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	1.8	--	--
300-109_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	6,420	15,700	No
300-109_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,800	22,000	No
300-109_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	14	--	--
300-109_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.75E+07	3.26E+07	No
300-109_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,890	10,200	No
300-109_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	278,000	512,000	No
300-109_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	22	13	Yes
300-109_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	341	470	No
300-109_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,490	19,100	No
300-109_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	1.6	--	--
300-109_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,108	3,210	Yes
300-109_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	47,600	85,100	No
300-109_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	34,700	67,800	No
300-109_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	1.1	Yes
300-109_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	1.1	Yes
300-109_Staging Pile Area_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.78E+06	1.18E+07	No
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	37	--	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	19	--	--
300-109_Staging Pile Area_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,580	6,470	No
300-109_Staging Pile Area_Focused	non-Rad	Barium	7440-39-3	µg/kg	72,700	132,000	No
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	2.1	--	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.3	--	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.3	--	--
300-109_Staging Pile Area_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	203	1,510	No
300-109_Staging Pile Area_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,060	3,890	No
300-109_Staging Pile Area_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	66	563	No
300-109_Staging Pile Area_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,170	18,500	No
300-109_Staging Pile Area_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,950	15,700	No
300-109_Staging Pile Area_Focused	non-Rad	Copper	7440-50-8	µg/kg	11,600	22,000	No
300-109_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	5.1	--	--
300-109_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	29	--	--
300-109_Staging Pile Area_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.84E+07	3.26E+07	No
300-109_Staging Pile Area_Focused	non-Rad	Lead	7439-92-1	µg/kg	5,030	10,200	No
300-109_Staging Pile Area_Focused	non-Rad	Manganese	7439-96-5	µg/kg	286,000	512,000	No
300-109_Staging Pile Area_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	408	470	No
300-109_Staging Pile Area_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,570	19,100	No
300-109_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	µg/kg	7.0	--	--
300-109_Staging Pile Area_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,450	--	--
300-109_Staging Pile Area_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,877	3,210	Yes
300-109_Staging Pile Area_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	45,100	85,100	No
300-109_Staging Pile Area_Focused	non-Rad	Zinc	7440-66-6	µg/kg	48,800	67,800	No
300-109_Staging Pile Area_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	2.5	1.1	Yes
300-109_Staging Pile Area_Focused	Rad	Uranium-238	U-238	pCi/g	2.3	1.1	Yes
300-18_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,200	6,470	No
300-18_Shallow	non-Rad	Barium	7440-39-3	µg/kg	63,400	132,000	No
300-18_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	650	1,510	No
300-18_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	40	563	No
300-18_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	6,900	18,500	No
300-18_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,600	10,200	No
300-18_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,136	3,210	No
300-18_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.65	1.1	No
300-18_Shallow	Rad	Uranium-238	U-238	pCi/g	0.41	1.1	No
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	120,000	--	--
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	230,000	--	--
300-23_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	52,000	--	--
300-259_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	5.99E+06	1.18E+07	No
300-259_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	322	130	Yes
300-259_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,096	6,470	No
300-259_Shallow	non-Rad	Barium	7440-39-3	µg/kg	75,232	132,000	No
300-259_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	226	1,510	No
300-259_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,303	3,890	No
300-259_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	252	563	No
300-259_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,901	18,500	No
300-259_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	5,831	15,700	No
300-259_Shallow	non-Rad	Copper	7440-50-8	µg/kg	10,692	22,000	No
300-259_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	3.26E+07	No
300-259_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,625	10,200	No
300-259_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	318,874	512,000	No
300-259_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	10	13	No
300-259_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	303	470	No
300-259_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,751	19,100	No
300-259_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,876	3,210	Yes
300-259_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	42,626	85,100	No

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
300-259_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	479,584	67,800	Yes
300-259_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.6	1.1	Yes
300-259_Shallow	Rad	Uranium-238	U-238	pCi/g	1.3	1.1	Yes
300-260_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.17E+06	1.18E+07	No
300-260_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	922	130	Yes
300-260_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,160	6,470	No
300-260_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	122,000	132,000	No
300-260_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	239	1,510	No
300-260_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	8,360	3,890	Yes
300-260_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	110	563	No
300-260_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,890	18,500	No
300-260_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,430	15,700	No
300-260_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	73,300	22,000	Yes
300-260_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.04E+07	3.26E+07	No
300-260_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	18,300	10,200	Yes
300-260_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	328,000	512,000	No
300-260_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	12	13	No
300-260_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	537	470	Yes
300-260_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,200	19,100	No
300-260_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	206	167	Yes
300-260_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,800	3,210	Yes
300-260_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	59,000	85,100	No
300-260_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	77,400	67,800	Yes
300-260_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.25	0.11	Yes
300-260_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	4.3	1.1	Yes
300-272_Overburden_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	13,100	--	--
300-272_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	43,100	--	--
300-275_Shallow_1	non-Rad	Acenaphthene	83-32-9	µg/kg	960	--	--
300-275_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	5.61E+06	1.18E+07	No
300-275_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	260	130	Yes
300-275_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	2,211	6,470	No
300-275_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	75,261	132,000	No
300-275_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.3	--	--
300-275_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.9	--	--
300-275_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	452	1,510	No
300-275_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	1,466	3,890	No
300-275_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	83	563	No
300-275_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	8,022	18,500	No
300-275_Shallow_1	non-Rad	Chrysene	218-01-9	µg/kg	2.2	--	--
300-275_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	5,847	15,700	No
300-275_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	42,923	22,000	Yes
300-275_Shallow_1	non-Rad	Fluoranthene	206-44-0	µg/kg	2,300	--	--
300-275_Shallow_1	non-Rad	Fluorene	86-73-7	µg/kg	81	--	--
300-275_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	1.79E+07	3.26E+07	No
300-275_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	7,189	10,200	No
300-275_Shallow_1	non-Rad	Lithium	7439-93-2	µg/kg	6,686	13,300	No
300-275_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	276,815	512,000	No
300-275_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	17	13	Yes
300-275_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	378	470	No
300-275_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	9,461	19,100	No
300-275_Shallow_1	non-Rad	Silver	7440-22-4	µg/kg	121	167	No
300-275_Shallow_1	non-Rad	Strontium	7440-24-6	µg/kg	20,196	--	--
300-275_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,483	--	--
300-275_Shallow_1	non-Rad	Uranium	7440-61-1	µg/kg	2,500	3,210	No
300-275_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	45,128	85,100	No
300-275_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	41,014	67,800	No
300-275_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.046	1.1	No
300-275_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	7.7	1.1	Yes
300-275_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.0	0.11	Yes
300-275_Shallow_1	Rad	Uranium-238	U-238	pCi/g	7.4	1.1	Yes
300-275_Shallow_2	non-Rad	Acenaphthene	83-32-9	µg/kg	3.6	--	--
300-275_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	6.24E+06	1.18E+07	No
300-275_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,761	6,470	No
300-275_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	68,607	132,000	No
300-275_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	254	1,510	No
300-275_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	1,147	3,890	No
300-275_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	144	563	No
300-275_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	8,994	18,500	No
300-275_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	5,977	15,700	No
300-275_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	11,596	22,000	No
300-275_Shallow_2	non-Rad	Fluoranthene	206-44-0	µg/kg	56	--	--
300-275_Shallow_2	non-Rad	Fluorene	86-73-7	µg/kg	2.6	--	--
300-275_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	3.26E+07	No
300-275_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	4,099	10,200	No
300-275_Shallow_2	non-Rad	Lithium	7439-93-2	µg/kg	7,067	13,300	No
300-275_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	292,731	512,000	No
300-275_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	28	13	Yes
300-275_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	404	470	No
300-275_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	9,593	19,100	No
300-275_Shallow_2	non-Rad	Strontium	7440-24-6	µg/kg	27,081	--	--
300-275_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,149	--	--
300-275_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,725	3,210	Yes
300-275_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	51,632	85,100	No
300-275_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	41,245	67,800	No
300-275_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	1.1	Yes
300-275_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	0.24	0.11	Yes
300-275_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.2	1.1	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.32E+06	1.18E+07	No
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1016	12674-11-2	µg/kg	10	--	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	16	--	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	190	--	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	84	--	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	17	--	--
300-33, 300-41, 300-256_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,638	6,470	No
300-33, 300-41, 300-256_Shallow	non-Rad	Barium	7440-39-3	µg/kg	72,411	132,000	No
300-33, 300-41, 300-256_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	256	1,510	No
300-33, 300-41, 300-256_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,484	3,890	No
300-33, 300-41, 300-256_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	228	--	--
300-33, 300-41, 300-256_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	94	563	No
300-33, 300-41, 300-256_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	8,781	18,500	No

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
300-33, 300-41, 300-256_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,273	15,700	No
300-33, 300-41, 300-256_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,662	22,000	No
300-33, 300-41, 300-256_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	1,651	2,810	No
300-33, 300-41, 300-256_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.00E+07	3.26E+07	No
300-33, 300-41, 300-256_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,268	10,200	No
300-33, 300-41, 300-256_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	5,495	13,300	No
300-33, 300-41, 300-256_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	314,762	512,000	No
300-33, 300-41, 300-256_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	16	13	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	2.9	--	--
300-33, 300-41, 300-256_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	486	470	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,880	19,100	No
300-33, 300-41, 300-256_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	8,617	52,000	No
300-33, 300-41, 300-256_Shallow	non-Rad	Silver	7440-22-4	µg/kg	782	167	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	7,260	3,210	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	52,694	85,100	No
300-33, 300-41, 300-256_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,462	67,800	No
300-33, 300-41, 300-256_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.1	1.1	Yes
300-33, 300-41, 300-256_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.34	0.11	Yes
300-33, 300-41, 300-256_Shallow	Rad	Uranium-238	U-238	pCi/g	2.1	1.1	Yes
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.51E+06	1.18E+07	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	330	--	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	385	--	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,240	6,470	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	64,600	132,000	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	169	1,510	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,030	3,890	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	100	563	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,080	18,500	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,640	15,700	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,400	22,000	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	1,300	2,810	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.86E+07	3.26E+07	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	3,160	10,200	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Lithium	7439-93-2	µg/kg	6,580	13,300	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	259,000	512,000	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2.2	--	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	275	470	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,040	19,100	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	17,900	52,000	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,460	3,210	Yes
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	51,400	85,100	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	38,900	67,800	No
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	3.0	1.1	Yes
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	2.2	1.1	Yes
300-37_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	100	--	--
300-37_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,200	--	--
300-44_Overburden_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	9,100	6,470	Yes
300-44_Overburden_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,027	3,210	No
300-44_Overburden_Focused	Rad	Uranium-238	U-238	pCi/g	0.35	1.1	No
300-44_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.71E+06	1.18E+07	No
300-44_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	4,100	130	Yes
300-44_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	16,900	6,470	Yes
300-44_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	75,200	132,000	No
300-44_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	480	1,510	No
300-44_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,300	18,500	No
300-44_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,200	15,700	No
300-44_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	7,800	22,000	No
300-44_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.94E+07	3.26E+07	No
300-44_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	303,000	512,000	No
300-44_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,600	19,100	No
300-44_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	872	3,210	No
300-44_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	43,200	85,100	No
300-44_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	37,800	67,800	No
300-44_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.29	1.1	No
300-45_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	86	--	--
300-45_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	290	--	--
300-45_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,600	3,210	Yes
300-45_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.023	1.1	No
300-45_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.061	0.11	No
300-45_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2	1.1	Yes
300-49_Overburden	non-Rad	1,2,4-Trichlorobenzene	120-82-1	µg/kg	31	--	--
300-49_Overburden	non-Rad	1,4-Dichlorobenzene	106-46-7	µg/kg	29	--	--
300-49_Overburden	non-Rad	2,4-Dinitrotoluene	121-14-2	µg/kg	19	--	--
300-49_Overburden	non-Rad	2-Chlorophenol	95-57-8	µg/kg	51	--	--
300-49_Overburden	non-Rad	4-Chloro-3-methylphenol	59-50-7	µg/kg	46	--	--
300-49_Overburden	non-Rad	Acenaphthene	83-32-9	µg/kg	31	--	--
300-49_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.30E+06	1.18E+07	No
300-49_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	232	130	Yes
300-49_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,008	--	--
300-49_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,291	6,470	No
300-49_Overburden	non-Rad	Barium	7440-39-3	µg/kg	76,068	132,000	No
300-49_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	201	1,510	No
300-49_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	174	563	No
300-49_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	18,106	18,500	No
300-49_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,127	15,700	No
300-49_Overburden	non-Rad	Copper	7440-50-8	µg/kg	536,000	22,000	Yes
300-49_Overburden	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	52	--	--
300-49_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.08E+07	3.26E+07	No
300-49_Overburden	non-Rad	Lead	7439-92-1	µg/kg	36,964	10,200	Yes
300-49_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	316,669	512,000	No
300-49_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	13,035	19,100	No
300-49_Overburden	non-Rad	n-Nitrosodi-n-dipropylamine	621-64-7	µg/kg	40	--	--
300-49_Overburden	non-Rad	Pentachlorophenol	87-86-5	µg/kg	50	--	--
300-49_Overburden	non-Rad	Phenol	108-95-2	µg/kg	50	--	--
300-49_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	40	--	--
300-49_Overburden	non-Rad	Silver	7440-22-4	µg/kg	703	167	Yes
300-49_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,066	3,210	No
300-49_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	50,380	85,100	No
300-49_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	141,984	67,800	Yes

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
300-49_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	1.0	1.1	No
300-49_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.057	0.11	No
300-49_Overburden	Rad	Uranium-238	U-238	pCi/g	1.0	1.1	No
300-49_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.92E+06	1.18E+07	No
300-49_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	176	130	Yes
300-49_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,431	6,470	No
300-49_Shallow	non-Rad	Barium	7440-39-3	µg/kg	89,874	132,000	No
300-49_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	303	1,510	No
300-49_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,170	18,500	No
300-49_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,323	15,700	No
300-49_Shallow	non-Rad	Copper	7440-50-8	µg/kg	14,870	22,000	No
300-49_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.59E+07	3.26E+07	No
300-49_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,629	10,200	No
300-49_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	361,805	512,000	No
300-49_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	10,664	19,100	No
300-49_Shallow	non-Rad	Silver	7440-22-4	µg/kg	621	167	Yes
300-49_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,983	3,210	No
300-49_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	58,672	85,100	No
300-49_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	54,651	67,800	No
300-49_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.15	1.1	No
300-49_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	1.1	Yes
300-49_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	0.11	Yes
300-49_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1	1.1	Yes
300-50_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.68E+06	1.18E+07	No
300-50_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	33	--	--
300-50_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	229	--	--
300-50_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	6,897	6,470	Yes
300-50_Overburden	non-Rad	Barium	7440-39-3	µg/kg	117,742	132,000	No
300-50_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	325	1,510	No
300-50_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	563	563	No
300-50_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	12,197	18,500	No
300-50_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	9,389	15,700	No
300-50_Overburden	non-Rad	Copper	7440-50-8	µg/kg	64,527	22,000	Yes
300-50_Overburden	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07	3.26E+07	No
300-50_Overburden	non-Rad	Lead	7439-92-1	µg/kg	5,905	10,200	No
300-50_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	314,271	512,000	No
300-50_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	15,229	19,100	No
300-50_Overburden	non-Rad	Silver	7440-22-4	µg/kg	1,202	167	Yes
300-50_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	17,919	3,210	Yes
300-50_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	45,243	85,100	No
300-50_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	45,889	67,800	No
300-50_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.056	1.1	No
300-50_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	6.0	1.1	Yes
300-50_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.45	0.11	Yes
300-50_Overburden	Rad	Uranium-238	U-238	pCi/g	6.0	1.1	Yes
300-50_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.88E+06	1.18E+07	No
300-50_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	3,000	130	Yes
300-50_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	126	--	--
300-50_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,403	6,470	No
300-50_Shallow	non-Rad	Barium	7440-39-3	µg/kg	103,029	132,000	No
300-50_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	282	1,510	No
300-50_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	19	--	--
300-50_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	463	563	No
300-50_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	16,841	18,500	No
300-50_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,109	15,700	No
300-50_Shallow	non-Rad	Copper	7440-50-8	µg/kg	16,820	22,000	No
300-50_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.96E+07	3.26E+07	No
300-50_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,381	10,200	No
300-50_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	318,120	512,000	No
300-50_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,413	19,100	No
300-50_Shallow	non-Rad	Silver	7440-22-4	µg/kg	2,992	167	Yes
300-50_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	22,938	3,210	Yes
300-50_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	46,964	85,100	No
300-50_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,344	67,800	No
300-50_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.056	1.1	No
300-50_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	7.9	1.1	Yes
300-50_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.66	0.11	Yes
300-50_Shallow	Rad	Uranium-238	U-238	pCi/g	8.4	1.1	Yes
300-8_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	574	1,510	No
300-8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,374	3,210	No
300-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.79	1.1	No
300-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.82	1.1	No
316-1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	40,572	3,210	Yes
316-1_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.10	1.1	No
316-1_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.32	0.0084	Yes
316-1_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	13	1.1	Yes
316-1_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	1.1	0.11	Yes
316-1_Overburden	Rad	Uranium-238	U-238	pCi/g	13	1.1	Yes
316-1_Shallow_1	non-Rad	Aroclor-1248	12672-29-6	µg/kg	3,000	--	--
316-1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	19,014	6,470	Yes
316-1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	69	--	--
316-1_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	98	--	--
316-1_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	83,027	3,210	Yes
316-1_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.032	1.1	No
316-1_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.2	0.11	Yes
316-1_Shallow_1	Rad	Uranium-238	U-238	pCi/g	28	1.1	Yes
316-1_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	1.11E+07	1.18E+07	No
316-1_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	490	130	Yes
316-1_Shallow_3	non-Rad	Aroclor-1254	11097-69-1	µg/kg	98	--	--
316-1_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	5,138	6,470	No
316-1_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	129,106	132,000	No
316-1_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	416	1,510	No
316-1_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	342	--	--
316-1_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	474	563	No
316-1_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	50,455	18,500	Yes
316-1_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	9,703	15,700	No
316-1_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	1.37E+06	22,000	Yes
316-1_Shallow_3	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	3.2	--	--
316-1_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.44E+07	3.26E+07	No
316-1_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	14,409	10,200	Yes

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
316-1_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	392,825	512,000	No
316-1_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	1,105	13	Yes
316-1_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	94,656	19,100	Yes
316-1_Shallow_3	non-Rad	Phenol	108-95-2	µg/kg	28	--	--
316-1_Shallow_3	non-Rad	Selenium	7782-49-2	µg/kg	1,444	780	Yes
316-1_Shallow_3	non-Rad	Silver	7440-22-4	µg/kg	13,196	167	Yes
316-1_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	63,074	3,210	Yes
316-1_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	56,707	85,100	No
316-1_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	82,016	67,800	Yes
316-1_Shallow_3	Rad	Cesium-137	10045-97-3	pCi/g	0.37	1.1	No
316-1_Shallow_3	Rad	Cobalt-60	10198-40-0	pCi/g	2.3	0.0084	Yes
316-1_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	23	1.1	Yes
316-1_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	2.6	0.11	Yes
316-1_Shallow_3	Rad	Uranium-238	U-238	pCi/g	21	1.1	Yes
316-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	µg/kg	62	--	--
316-1_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	42,963	3,210	Yes
316-1_Shallow_4	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	0.0084	Yes
316-1_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	16	1.1	Yes
316-1_Shallow_4	Rad	Uranium-235	15117-96-1	pCi/g	1.1	0.11	Yes
316-1_Shallow_4	Rad	Uranium-238	U-238	pCi/g	14	1.1	Yes
316-2_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	210,452	3,210	Yes
316-2_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.031	1.1	No
316-2_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.092	0.0084	Yes
316-2_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	86	1.1	Yes
316-2_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	12	0.11	Yes
316-2_Shallow_1	Rad	Uranium-238	U-238	pCi/g	69	1.1	Yes
316-2_Shallow_2	non-Rad	Aroclor-1248	12672-29-6	µg/kg	697	--	--
316-2_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	µg/kg	42	--	--
316-2_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	110	--	--
316-2_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	291,369	3,210	Yes
316-2_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	0.45	1.1	No
316-2_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.45	0.0084	Yes
316-2_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	115	1.1	Yes
316-2_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	11	0.11	Yes
316-2_Shallow_2	Rad	Uranium-238	U-238	pCi/g	96	1.1	Yes
316-2_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	8,000	6,470	Yes
316-2_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	260	--	--
316-2_Shallow_3	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	180	--	--
316-2_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	73,174	3,210	Yes
316-2_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.91	0.11	Yes
316-2_Shallow_3	Rad	Uranium-238	U-238	pCi/g	24	1.1	Yes
316-5_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	3,070	6,470	No
316-5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	38	--	--
316-5_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	146	--	--
316-5_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	100	--	--
316-5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	271,835	3,210	Yes
316-5_Shallow_1	Rad	Americium-241	14596-10-2	pCi/g	0.48	--	--
316-5_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	2.3	1.1	Yes
316-5_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	19	0.11	Yes
316-5_Shallow_1	Rad	Uranium-238	U-238	pCi/g	89	1.1	Yes
316-5_Shallow_2	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	140	--	--
316-5_Shallow_2	non-Rad	2-Butoxyethanol	111-76-2	µg/kg	240	--	--
316-5_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	3,180	6,470	No
316-5_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	76,700	132,000	No
316-5_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	180	--	--
316-5_Shallow_2	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	110	--	--
316-5_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	6,900	18,500	No
316-5_Shallow_2	non-Rad	Chrysene	218-01-9	µg/kg	38	--	--
316-5_Shallow_2	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	146	--	--
316-5_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	3,200	10,200	No
316-5_Shallow_2	non-Rad	Selenium	7782-49-2	µg/kg	490	780	No
316-5_Shallow_2	non-Rad	Silver	7440-22-4	µg/kg	3,600	167	Yes
316-5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	204,701	3,210	Yes
316-5_Shallow_2	Rad	Americium-241	14596-10-2	pCi/g	0.12	--	--
316-5_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	1.7	1.1	Yes
316-5_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	0.0084	Yes
316-5_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	9.0	0.11	Yes
316-5_Shallow_2	Rad	Uranium-238	U-238	pCi/g	68	1.1	Yes
316-5_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	57	--	--
316-5_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	70	--	--
316-5_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--	--
316-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,300	6,470	No
316-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	190	--	--
316-5_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	1,500	--	--
316-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	138,095	3,210	Yes
316-5_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.8	1.1	Yes
316-5_Shallow_Focused	Rad	Europium-155	14391-16-3	pCi/g	0.072	0.054	Yes
316-5_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	7.7	0.11	Yes
316-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	45	1.1	Yes
331 LSLDF_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	25	--	--
331 LSLDF_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	590	--	--
331 LSLDF_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	0.56	--	--
331 LSLDF_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	µg/kg	0.39	--	--
331 LSLDF_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.90E+06	1.18E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	360	130	Yes
331 LSLDF_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	850	--	--
331 LSLDF_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,400	6,470	No
331 LSLDF_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	78,600	132,000	No
331 LSLDF_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	570	1,510	No
331 LSLDF_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	910	--	--
331 LSLDF_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,700	3,890	No
331 LSLDF_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	340	--	--
331 LSLDF_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	140	563	No
331 LSLDF_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,300	18,500	No
331 LSLDF_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	15,700	No
331 LSLDF_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,400	22,000	No
331 LSLDF_Shallow_Focused	non-Rad	Dieldrin	60-57-1	µg/kg	13	--	--
331 LSLDF_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	98	--	--
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan I	959-98-8	µg/kg	1.9	--	--
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	µg/kg	3.1	--	--

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
331 LSLDF_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.20E+07	3.26E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	9,000	10,200	No
331 LSLDF_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	349,000	512,000	No
331 LSLDF_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	110	13	Yes
331 LSLDF_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	µg/kg	3.3	--	--
331 LSLDF_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	11	--	--
331 LSLDF_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	590	470	Yes
331 LSLDF_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000	19,100	No
331 LSLDF_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	41,700	52,000	No
331 LSLDF_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	9,500	--	--
331 LSLDF_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,100	167	Yes
331 LSLDF_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	2,300	3,210	No
331 LSLDF_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	53,100	85,100	No
331 LSLDF_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	137,000	67,800	Yes
331 LSLDF_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	1.1	No
331 LSLDF_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.47	1.1	No
600-243_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	µg/kg	279	--	--
600-243_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	31	--	--
600-243_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	1,300	130	Yes
600-243_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	27	--	--
600-243_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	18	--	--
600-243_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,159	6,470	No
600-243_Shallow	non-Rad	Barium	7440-39-3	µg/kg	292,072	132,000	Yes
600-243_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	43	--	--
600-243_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	43	--	--
600-243_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	46	--	--
600-243_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	32	--	--
600-243_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	2,079	1,510	Yes
600-243_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	432	--	--
600-243_Shallow	non-Rad	Boron	7440-42-8	µg/kg	294,463	3,890	Yes
600-243_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	793	563	Yes
600-243_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	18,006	18,500	No
600-243_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	63	--	--
600-243_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,207	15,700	No
600-243_Shallow	non-Rad	Copper	7440-50-8	µg/kg	53,981	22,000	Yes
600-243_Shallow	non-Rad	Dibenzofuran	132-64-9	µg/kg	78	--	--
600-243_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	37	--	--
600-243_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	79	--	--
600-243_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	28	--	--
600-243_Shallow	non-Rad	Lead	7439-92-1	µg/kg	40,139	10,200	Yes
600-243_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	208,289	512,000	No
600-243_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	1,869	470	Yes
600-243_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	204	--	--
600-243_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	21,395	19,100	Yes
600-243_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	70	--	--
600-243_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	5,709	780	Yes
600-243_Shallow	non-Rad	Silver	7440-22-4	µg/kg	500	167	Yes
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	95,319	--	--
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	334,524	--	--
600-243_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	46,986	85,100	No
600-243_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	84,099	67,800	Yes
600-259_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.034	1.1	No
600-259_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.068	1.1	No
600-259_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.038	1.1	No
600-47_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,300	6,470	No
600-47_Shallow	non-Rad	Barium	7440-39-3	µg/kg	67,000	132,000	No
600-47_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	500	1,510	No
600-47_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	90	563	No
600-47_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	5,500	18,500	No
600-47_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,500	10,200	No
600-47_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,303	3,210	Yes
600-47_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	1.1	Yes
600-47_Shallow	Rad	Uranium-238	U-238	pCi/g	1.6	1.1	Yes
618-1_Deep	non-Rad	Aluminum	7429-90-5	µg/kg	6.37E+06	1.18E+07	No
618-1_Deep	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,760	--	--
618-1_Deep	non-Rad	Aroclor-1260	11096-82-5	µg/kg	294	--	--
618-1_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,550	6,470	No
618-1_Deep	non-Rad	Barium	7440-39-3	µg/kg	299,000	132,000	Yes
618-1_Deep	non-Rad	Beryllium	7440-41-7	µg/kg	218	1,510	No
618-1_Deep	non-Rad	Boron	7440-42-8	µg/kg	1,360	3,890	No
618-1_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	263	563	No
618-1_Deep	non-Rad	Chromium	7440-47-3	µg/kg	7,740	18,500	No
618-1_Deep	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	15,700	No
618-1_Deep	non-Rad	Copper	7440-50-8	µg/kg	46,300	22,000	Yes
618-1_Deep	non-Rad	Fluoride	16984-48-8	µg/kg	2,800	2,810	No
618-1_Deep	non-Rad	Iron	7439-89-6	µg/kg	2.47E+07	3.26E+07	No
618-1_Deep	non-Rad	Lead	7439-92-1	µg/kg	58,400	10,200	Yes
618-1_Deep	non-Rad	Lithium	7439-93-2	µg/kg	5,980	13,300	No
618-1_Deep	non-Rad	Manganese	7439-96-5	µg/kg	352,000	512,000	No
618-1_Deep	non-Rad	Mercury	7439-97-6	µg/kg	1,180	13	Yes
618-1_Deep	non-Rad	Molybdenum	7439-98-7	µg/kg	493	470	Yes
618-1_Deep	non-Rad	Nickel	7440-02-0	µg/kg	17,600	19,100	No
618-1_Deep	non-Rad	Nitrate	14797-55-8	µg/kg	1,700	52,000	No
618-1_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	220	--	--
618-1_Deep	non-Rad	Uranium	7440-61-1	µg/kg	37,400	3,210	Yes
618-1_Deep	non-Rad	Vanadium	7440-62-2	µg/kg	73,000	85,100	No
618-1_Deep	non-Rad	Zinc	7440-66-6	µg/kg	134,000	67,800	Yes
618-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.46	1.1	No
618-1_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	33	1.1	Yes
618-1_Deep	Rad	Uranium-235	15117-96-1	pCi/g	2.7	0.11	Yes
618-1_Deep	Rad	Uranium-238	U-238	pCi/g	32	1.1	Yes
618-1_Deep_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.57E+06	1.18E+07	No
618-1_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	407	130	Yes
618-1_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1.24E+06	--	--
618-1_Deep_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	99	--	--
618-1_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,580	6,470	No
618-1_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	1.87E+06	132,000	Yes
618-1_Deep_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	323	1,510	No
618-1_Deep_Focused	non-Rad	Boron	7440-42-8	µg/kg	6,620	3,890	Yes
618-1_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,030	563	Yes

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
618-1_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	18,900	18,500	Yes
618-1_Deep_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,920	15,700	No
618-1_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	68,700	22,000	Yes
618-1_Deep_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	3,300	2,810	Yes
618-1_Deep_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.41E+07	3.26E+07	No
618-1_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	333,000	10,200	Yes
618-1_Deep_Focused	non-Rad	Lithium	7439-93-2	µg/kg	8,450	13,300	No
618-1_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	351,000	512,000	No
618-1_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	8,940	13	Yes
618-1_Deep_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	2,140	470	Yes
618-1_Deep_Focused	non-Rad	Nickel	7440-02-0	µg/kg	13,700	19,100	No
618-1_Deep_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	11,900	52,000	No
618-1_Deep_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,560	--	--
618-1_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,290	167	Yes
618-1_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	209,000	3,210	Yes
618-1_Deep_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	70,900	85,100	No
618-1_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	82,000	67,800	Yes
618-1_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	6.5	1.1	Yes
618-1_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	70	1.1	Yes
618-1_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.5	0.11	Yes
618-1_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	65	1.1	Yes
618-1_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.21E+06	1.18E+07	No
618-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	264	--	--
618-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	54	--	--
618-1_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,280	6,470	No
618-1_Shallow	non-Rad	Barium	7440-39-3	µg/kg	97,200	132,000	No
618-1_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	188	1,510	No
618-1_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,190	3,890	No
618-1_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	68	563	No
618-1_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,930	18,500	No
618-1_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,360	15,700	No
618-1_Shallow	non-Rad	Copper	7440-50-8	µg/kg	11,400	22,000	No
618-1_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	400	2,810	No
618-1_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07	3.26E+07	No
618-1_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,100	10,200	No
618-1_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	6,380	13,300	No
618-1_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	300,000	512,000	No
618-1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	31	13	Yes
618-1_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	336	470	No
618-1_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,150	19,100	No
618-1_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	1,600	52,000	No
618-1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	300	--	--
618-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,224	3,210	Yes
618-1_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	56,300	85,100	No
618-1_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	42,100	67,800	No
618-1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	1.1	Yes
618-1_Shallow	Rad	Uranium-238	U-238	pCi/g	1.5	1.1	Yes
618-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	1.22E+07	1.18E+07	Yes
618-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	455	130	Yes
618-1_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	35	--	--
618-1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	981	--	--
618-1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	56	--	--
618-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	6,090	6,470	No
618-1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	102,000	132,000	No
618-1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	371	1,510	No
618-1_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	3,740	3,890	No
618-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	266	563	No
618-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	19,500	18,500	Yes
618-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	15,700	No
618-1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	23,800	22,000	Yes
618-1_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	900	2,810	No
618-1_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.28E+07	3.26E+07	No
618-1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,210	10,200	No
618-1_Shallow_Focused	non-Rad	Lithium	7439-93-2	µg/kg	13,300	13,300	No
618-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	403,000	512,000	No
618-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	198	13	Yes
618-1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	356	470	No
618-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	16,800	19,100	No
618-1_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	3,800	52,000	No
618-1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	260	--	--
618-1_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,120	167	Yes
618-1_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	7,080	3,210	Yes
618-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	64,700	85,100	No
618-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	68,100	67,800	Yes
618-1_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	1.1	Yes
618-1_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.99	0.11	Yes
618-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	8.2	1.1	Yes
618-12_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	8,557	6,470	Yes
618-12_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	63	--	--
618-12_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	60	--	--
618-12_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	32,092	3,210	Yes
618-12_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.47	0.11	Yes
618-12_Shallow	Rad	Uranium-238	U-238	pCi/g	11	1.1	Yes
618-13_Shallow	non-Rad	Acetone	67-64-1	µg/kg	8.6	--	--
618-13_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.34E+06	1.18E+07	No
618-13_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	312	130	Yes
618-13_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,500	6,470	No
618-13_Shallow	non-Rad	Barium	7440-39-3	µg/kg	74,000	132,000	No
618-13_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	212	1,510	No
618-13_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,050	3,890	No
618-13_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	63	563	No
618-13_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,700	18,500	No
618-13_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,290	15,700	No
618-13_Shallow	non-Rad	Copper	7440-50-8	µg/kg	11,500	22,000	No
618-13_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.01E+07	3.26E+07	No
618-13_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,620	10,200	No
618-13_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	344,000	512,000	No
618-13_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	5.1	--	--
618-13_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	420	470	No
618-13_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,400	19,100	No

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
618-13_Shallow	non-Rad	Tin	7440-31-5	µg/kg	1,050	--	--
618-13_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,750	3,210	No
618-13_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	55,800	85,100	No
618-13_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,400	67,800	No
618-13_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.038	1.1	No
618-13_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	1.1	Yes
618-13_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	1.1	Yes
618-13_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	5.9	--	--
618-13_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.22E+06	1.18E+07	No
618-13_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	233	130	Yes
618-13_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,390	6,470	No
618-13_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	57,700	132,000	No
618-13_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	184	1,510	No
618-13_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	960	3,890	No
618-13_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	47	563	No
618-13_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,740	18,500	No
618-13_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,710	15,700	No
618-13_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,100	22,000	No
618-13_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	150	--	--
618-13_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.79E+07	3.26E+07	No
618-13_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	4,940	10,200	No
618-13_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	268,000	512,000	No
618-13_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	5.0	--	--
618-13_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	297	470	No
618-13_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000	19,100	No
618-13_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	745	--	--
618-13_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	1,500	3,210	No
618-13_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	48,600	85,100	No
618-13_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	37,100	67,800	No
618-13_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	1.1	Yes
618-13_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.96	1.1	No
618-2_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	1,500	6,470	No
618-2_Deep	non-Rad	Barium	7440-39-3	µg/kg	83,300	132,000	No
618-2_Deep	non-Rad	Chromium	7440-47-3	µg/kg	6,700	18,500	No
618-2_Deep	non-Rad	Lead	7439-92-1	µg/kg	6,600	10,200	No
618-2_Deep	non-Rad	Selenium	7782-49-2	µg/kg	780	780	No
618-2_Deep	non-Rad	Tin	7440-31-5	µg/kg	2,900	--	--
618-2_Deep	non-Rad	Uranium	7440-61-1	µg/kg	501,000	3,210	Yes
618-2_Deep	Rad	Americium-241	14596-10-2	pCi/g	7.9	--	--
618-2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	1.0	1.1	No
618-2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	1.5	0.0038	Yes
618-2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	91	0.025	Yes
618-2_Deep	Rad	Plutonium-241	14119-32-5	pCi/g	42	--	--
618-2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	12	0.18	Yes
618-2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	161	1.1	Yes
618-2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.78	0.11	Yes
618-2_Deep	Rad	Uranium-238	U-238	pCi/g	165	1.1	Yes
618-2_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	6.9	--	--
618-2_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,300	6,470	No
618-2_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	109,000	132,000	No
618-2_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	27	--	--
618-2_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	200	563	No
618-2_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,400	18,500	No
618-2_Deep_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	18	--	--
618-2_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,800	10,200	No
618-2_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	1,200	780	Yes
618-2_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	600	167	Yes
618-2_Deep_Focused	non-Rad	Tin	7440-31-5	µg/kg	42,500	--	--
618-2_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	148,000	3,210	Yes
618-2_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	9.2	--	--
618-2_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.1	1.1	Yes
618-2_Deep_Focused	Rad	Plutonium-238	13981-16-3	pCi/g	1.6	0.0038	Yes
618-2_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	92	0.025	Yes
618-2_Deep_Focused	Rad	Plutonium-241	14119-32-5	pCi/g	33	--	--
618-2_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	7.2	0.18	Yes
618-2_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	48	1.1	Yes
618-2_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	2.4	0.11	Yes
618-2_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	50	1.1	Yes
618-2_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	6,470	No
618-2_Overburden	non-Rad	Barium	7440-39-3	µg/kg	74,700	132,000	No
618-2_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	6,600	18,500	No
618-2_Overburden	non-Rad	Lead	7439-92-1	µg/kg	4,300	10,200	No
618-2_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	1,000	780	Yes
618-2_Overburden	non-Rad	Tin	7440-31-5	µg/kg	2,700	--	--
618-2_Overburden	non-Rad	Uranium	7440-61-1	µg/kg	1,140	3,210	No
618-2_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.058	1.1	No
618-2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.64	1.1	No
618-2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.59	1.1	No
618-2_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	1,900	6,470	No
618-2_Shallow	non-Rad	Barium	7440-39-3	µg/kg	79,100	132,000	No
618-2_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,100	18,500	No
618-2_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,600	10,200	No
618-2_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	760	780	No
618-2_Shallow	non-Rad	Tin	7440-31-5	µg/kg	2,400	--	--
618-2_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	4,530	3,210	Yes
618-2_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.81	--	--
618-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.2	1.1	Yes
618-2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	7.7	0.025	Yes
618-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.2	1.1	Yes
618-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.21	0.11	Yes
618-2_Shallow	Rad	Uranium-238	U-238	pCi/g	2.2	1.1	Yes
618-2_Staging Pile	non-Rad	Arsenic	7440-38-2	µg/kg	3,063	6,470	No
618-2_Staging Pile	non-Rad	Barium	7440-39-3	µg/kg	67,690	132,000	No
618-2_Staging Pile	non-Rad	Chromium	7440-47-3	µg/kg	6,424	18,500	No
618-2_Staging Pile	non-Rad	Lead	7439-92-1	µg/kg	4,011	10,200	No
618-2_Staging Pile	non-Rad	Uranium	7440-61-1	µg/kg	5,022	3,210	Yes
618-2_Staging Pile	Rad	Americium-241	14596-10-2	pCi/g	0.82	--	--
618-2_Staging Pile	Rad	Cesium-137	10045-97-3	pCi/g	0.095	1.1	No
618-2_Staging Pile	Rad	Plutonium-239/240	PU-239/240	pCi/g	10	0.025	Yes
618-2_Staging Pile	Rad	Tritium	10028-17-8	pCi/g	2.3	--	--

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
618-2_Staging Pile	Rad	Uranium-233/234	U-233/234	pCi/g	2.0	1.1	Yes
618-2_Staging Pile	Rad	Uranium-235	15117-96-1	pCi/g	0.12	0.11	Yes
618-2_Staging Pile	Rad	Uranium-238	U-238	pCi/g	2.0	1.1	Yes
618-3_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,800	6,470	No
618-3_Shallow	non-Rad	Barium	7440-39-3	µg/kg	76,500	132,000	No
618-3_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,700	18,500	No
618-3_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,900	10,200	No
618-3_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	659	780	No
618-3_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,610	3,210	No
618-3_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.68	1.1	No
618-3_Shallow	Rad	Uranium-238	U-238	pCi/g	0.75	1.1	No
618-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	238,577	3,210	Yes
618-3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	80	1.1	Yes
618-3_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.8	0.11	Yes
618-3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	79	1.1	Yes
618-4_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,200	6,470	No
618-4_Deep	non-Rad	Lead	7439-92-1	µg/kg	20,000	10,200	Yes
618-4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	64,506	3,210	Yes
618-4_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	20	1.1	Yes
618-4_Deep	Rad	Uranium-235	15117-96-1	pCi/g	1.1	0.11	Yes
618-4_Deep	Rad	Uranium-238	U-238	pCi/g	22	1.1	Yes
618-4_Deep_Focused	non-Rad	2-Butanone	78-93-3	µg/kg	130	--	--
618-4_Deep_Focused	non-Rad	Acetone	67-64-1	µg/kg	16	--	--
618-4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,600	--	--
618-4_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	6,470	No
618-4_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	104,000	132,000	No
618-4_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	4,700	--	--
618-4_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,500	563	Yes
618-4_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	27,700	18,500	Yes
618-4_Deep_Focused	non-Rad	Diethyl ether	60-29-7	µg/kg	1.0	--	--
618-4_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	24,900	10,200	Yes
618-4_Deep_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	40	--	--
618-4_Deep_Focused	non-Rad	Phenol	108-95-2	µg/kg	110	--	--
618-4_Deep_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	24	--	--
618-4_Deep_Focused	non-Rad	Toluene	108-88-3	µg/kg	4.8	--	--
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	34,000	--	--
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - kerosene range	TPHKEROSENE	µg/kg	42,000	--	--
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	65	--	--
618-4_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	20,777	3,210	Yes
618-4_Deep_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	--	--
618-4_Deep_Focused	non-Rad	Trichloromonofluoromethane	75-69-4	µg/kg	12	--	--
618-4_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	7.2	1.1	Yes
618-4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.51	0.11	Yes
618-4_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	6.9	1.1	Yes
618-4_Overburden_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,500	6,470	No
618-4_Overburden_2	non-Rad	Lead	7439-92-1	µg/kg	4,700	10,200	No
618-4_Overburden_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,197	3,210	Yes
618-4_Overburden_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	1.1	Yes
618-4_Overburden_2	Rad	Uranium-238	U-238	pCi/g	1.4	1.1	Yes
618-4_Overburden_3	non-Rad	Lead	7439-92-1	µg/kg	5,000	10,200	No
618-4_Overburden_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,171	3,210	No
618-4_Overburden_3	Rad	Uranium-233/234	U-233/234	pCi/g	0.42	1.1	No
618-4_Overburden_3	Rad	Uranium-235	15117-96-1	pCi/g	0.032	0.11	No
618-4_Overburden_3	Rad	Uranium-238	U-238	pCi/g	0.44	1.1	No
618-4_Overburden_4	non-Rad	Lead	7439-92-1	µg/kg	4,800	10,200	No
618-4_Overburden_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,323	3,210	No
618-4_Overburden_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.94	1.1	No
618-4_Overburden_4	Rad	Uranium-238	U-238	pCi/g	0.94	1.1	No
618-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,200	6,470	No
618-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	49,000	10,200	Yes
618-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	7,456	3,210	Yes
618-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	3.2	1.1	Yes
618-4_Shallow	Rad	Uranium-238	U-238	pCi/g	3.1	1.1	Yes
618-5_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	5,200	6,470	No
618-5_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	470	563	No
618-5_Deep	non-Rad	Chromium	7440-47-3	µg/kg	14,700	18,500	No
618-5_Deep	non-Rad	Lead	7439-92-1	µg/kg	82,300	10,200	Yes
618-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	26,618	3,210	Yes
618-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	8.6	1.1	Yes
618-5_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.46	0.11	Yes
618-5_Deep	Rad	Uranium-238	U-238	pCi/g	8.9	1.1	Yes
618-5_Deep_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.65E+06	1.18E+07	No
618-5_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	1,800	130	Yes
618-5_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,500	6,470	No
618-5_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	106,000	132,000	No
618-5_Deep_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	672	1,510	No
618-5_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,500	18,500	No
618-5_Deep_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	10,500	15,700	No
618-5_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	21,400	22,000	No
618-5_Deep_Focused	non-Rad	Iron	7439-89-6	µg/kg	3.02E+07	3.26E+07	No
618-5_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,600	10,200	No
618-5_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	579,000	512,000	Yes
618-5_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	33	13	Yes
618-5_Deep_Focused	non-Rad	Nickel	7440-02-0	µg/kg	11,300	19,100	No
618-5_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	2,270	780	Yes
618-5_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	36,540	3,210	Yes
618-5_Deep_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	79,500	85,100	No
618-5_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	65,800	67,800	No
618-5_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	1.1	Yes
618-5_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.48	0.11	Yes
618-5_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	12	1.1	Yes
618-5_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,400	6,470	No
618-5_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	170	563	No
618-5_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	9,700	18,500	No
618-5_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,500	10,200	No
618-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	9,773	3,210	Yes
618-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	4.1	1.1	Yes
618-5_Overburden	Rad	Uranium-238	U-238	pCi/g	4.6	1.1	Yes
618-5_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,300	6,470	No
618-5_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,300	18,500	No

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
618-5_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,100	10,200	No
618-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,849	3,210	No
618-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.94	1.1	No
618-5_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1	1.1	No
618-5_Staging Pile_4	non-Rad	Arsenic	7440-38-2	µg/kg	3,300	6,470	No
618-5_Staging Pile_4	non-Rad	Cadmium	7440-43-9	µg/kg	50	563	No
618-5_Staging Pile_4	non-Rad	Chromium	7440-47-3	µg/kg	11,800	18,500	No
618-5_Staging Pile_4	non-Rad	Lead	7439-92-1	µg/kg	5,300	10,200	No
618-5_Staging Pile_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,364	3,210	Yes
618-5_Staging Pile_4	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	1.1	Yes
618-5_Staging Pile_4	Rad	Uranium-238	U-238	pCi/g	1.1	1.1	Yes
618-5_Staging Pile_5	non-Rad	Arsenic	7440-38-2	µg/kg	2,700	6,470	No
618-5_Staging Pile_5	non-Rad	Chromium	7440-47-3	µg/kg	10,300	18,500	No
618-5_Staging Pile_5	non-Rad	Lead	7439-92-1	µg/kg	3,900	10,200	No
618-5_Staging Pile_5	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,326	3,210	Yes
618-5_Staging Pile_5	Rad	Uranium-233/234	U-233/234	pCi/g	1.5	1.1	Yes
618-5_Staging Pile_5	Rad	Uranium-235	15117-96-1	pCi/g	0.17	0.11	Yes
618-5_Staging Pile_5	Rad	Uranium-238	U-238	pCi/g	1.7	1.1	Yes
618-7_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	5.25E+06	1.18E+07	No
618-7_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	560	130	Yes
618-7_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	1,891	6,470	No
618-7_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	68,874	132,000	No
618-7_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	278	1,510	No
618-7_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	65	563	No
618-7_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	10,227	18,500	No
618-7_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	9,152	15,700	No
618-7_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	16,120	22,000	No
618-7_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	2.60E+07	3.26E+07	No
618-7_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	14,567	10,200	Yes
618-7_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	326,067	512,000	No
618-7_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	44	13	Yes
618-7_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	20,977	19,100	Yes
618-7_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,547	--	--
618-7_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	10,814	3,210	Yes
618-7_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	74,576	85,100	No
618-7_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	49,177	67,800	No
618-7_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.067	1.1	No
618-7_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	3.6	1.1	Yes
618-7_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	0.36	0.11	Yes
618-7_Shallow_1	Rad	Uranium-238	U-238	pCi/g	3.6	1.1	Yes
618-7_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	4.97E+06	1.18E+07	No
618-7_Shallow_2	non-Rad	Antimony	7440-36-0	µg/kg	660	130	Yes
618-7_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,500	6,470	No
618-7_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	73,800	132,000	No
618-7_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	440	1,510	No
618-7_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	6,800	18,500	No
618-7_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	9,300	15,700	No
618-7_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	13,600	22,000	No
618-7_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	2.60E+07	3.26E+07	No
618-7_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	2,800	10,200	No
618-7_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	364,000	512,000	No
618-7_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	20	13	Yes
618-7_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	9,700	19,100	No
618-7_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,500	--	--
618-7_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,574	3,210	No
618-7_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	74,700	85,100	No
618-7_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	46,200	67,800	No
618-7_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.57	1.1	No
618-7_Shallow_2	Rad	Uranium-238	U-238	pCi/g	0.53	1.1	No
618-7_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	6.74E+06	1.18E+07	No
618-7_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	450	130	Yes
618-7_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	2,800	6,470	No
618-7_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	82,500	132,000	No
618-7_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	310	1,510	No
618-7_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	190	563	No
618-7_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	10,100	18,500	No
618-7_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	8,600	15,700	No
618-7_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	13,600	22,000	No
618-7_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.43E+07	3.26E+07	No
618-7_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	4,300	10,200	No
618-7_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	357,000	512,000	No
618-7_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	20	13	Yes
618-7_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	10,100	19,100	No
618-7_Shallow_3	non-Rad	Tin	7440-31-5	µg/kg	1,800	--	--
618-7_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,852	3,210	No
618-7_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	68,200	85,100	No
618-7_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	44,500	67,800	No
618-7_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	1.1	No
618-7_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.085	0.11	No
618-7_Shallow_3	Rad	Uranium-238	U-238	pCi/g	0.95	1.1	No
618-7_Shallow_4	non-Rad	Aluminum	7429-90-5	µg/kg	5.65E+06	1.18E+07	No
618-7_Shallow_4	non-Rad	Antimony	7440-36-0	µg/kg	250	130	Yes
618-7_Shallow_4	non-Rad	Arsenic	7440-38-2	µg/kg	5,200	6,470	No
618-7_Shallow_4	non-Rad	Barium	7440-39-3	µg/kg	57,900	132,000	No
618-7_Shallow_4	non-Rad	Beryllium	7440-41-7	µg/kg	220	1,510	No
618-7_Shallow_4	non-Rad	Cadmium	7440-43-9	µg/kg	90	563	No
618-7_Shallow_4	non-Rad	Chromium	7440-47-3	µg/kg	11,400	18,500	No
618-7_Shallow_4	non-Rad	Cobalt	7440-48-4	µg/kg	6,700	15,700	No
618-7_Shallow_4	non-Rad	Copper	7440-50-8	µg/kg	13,200	22,000	No
618-7_Shallow_4	non-Rad	Iron	7439-89-6	µg/kg	2.12E+07	3.26E+07	No
618-7_Shallow_4	non-Rad	Lead	7439-92-1	µg/kg	3,000	10,200	No
618-7_Shallow_4	non-Rad	Manganese	7439-96-5	µg/kg	285,000	512,000	No
618-7_Shallow_4	non-Rad	Nickel	7440-02-0	µg/kg	12,900	19,100	No
618-7_Shallow_4	non-Rad	Tin	7440-31-5	µg/kg	710	--	--
618-7_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,064	3,210	No
618-7_Shallow_4	non-Rad	Vanadium	7440-62-2	µg/kg	54,800	85,100	No
618-7_Shallow_4	non-Rad	Zinc	7440-66-6	µg/kg	37,000	67,800	No
618-7_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.69	1.1	No
618-7_Shallow_4	Rad	Uranium-238	U-238	pCi/g	0.76	1.1	No
618-7_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	150	--	--

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
618-7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.61E+06	1.18E+07	No
618-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	980	130	Yes
618-7_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	6.7	--	--
618-7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,200	6,470	No
618-7_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	92,800	132,000	No
618-7_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	88	--	--
618-7_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	66	--	--
618-7_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	52	--	--
618-7_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	11	--	--
618-7_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	370	1,510	No
618-7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	470	--	--
618-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	6,200	563	Yes
618-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	65,900	18,500	Yes
618-7_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	69	--	--
618-7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,000	15,700	No
618-7_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	25,000	22,000	Yes
618-7_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	45	--	--
618-7_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	33	--	--
618-7_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	48	--	--
618-7_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.87E+07	3.26E+07	No
618-7_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,500	10,200	No
618-7_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	425,000	512,000	No
618-7_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	20	13	Yes
618-7_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	17,200	19,100	No
618-7_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	410	--	--
618-7_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,200	--	--
618-7_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	680,000	--	--
618-7_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	19,563	3,210	Yes
618-7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	80,500	85,100	No
618-7_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	52,400	67,800	No
618-7_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.010	1.1	No
618-7_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	1.1	Yes
618-7_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.97	0.11	Yes
618-7_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	6.4	1.1	Yes
618-8_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,100	6,470	No
618-8_Shallow	non-Rad	Barium	7440-39-3	µg/kg	97,600	132,000	No
618-8_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	12,400	18,500	No
618-8_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,100	10,200	No
618-8_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	846	780	Yes
618-8_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	1,720	3,210	No
618-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	1.1	Yes
618-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.73	1.1	No
618-9_Shallow_Focused	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	110	--	--
618-9_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	680	--	--
618-9_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	390	--	--
618-9_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.57E+06	1.18E+07	No
618-9_Shallow_Focused	non-Rad	Aroclor-1016	12674-11-2	µg/kg	1,900	--	--
618-9_Shallow_Focused	non-Rad	Aroclor-1221	11104-28-2	µg/kg	1,900	--	--
618-9_Shallow_Focused	non-Rad	Aroclor-1232	11141-16-5	µg/kg	1,900	--	--
618-9_Shallow_Focused	non-Rad	Aroclor-1242	53469-21-9	µg/kg	1,900	--	--
618-9_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,900	--	--
618-9_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,900	--	--
618-9_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,900	--	--
618-9_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	11,600	6,470	Yes
618-9_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	90,200	132,000	No
618-9_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	330	1,510	No
618-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	5,200	--	--
618-9_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	2,700	--	--
618-9_Shallow_Focused	non-Rad	Chlordane	57-74-9	µg/kg	69	--	--
618-9_Shallow_Focused	non-Rad	Chloroform	67-66-3	µg/kg	9.0	--	--
618-9_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,700	18,500	No
618-9_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,400	15,700	No
618-9_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	16,700	22,000	No
618-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	7,200	--	--
618-9_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	44	--	--
618-9_Shallow_Focused	non-Rad	Hexachlorobutadiene	87-68-3	µg/kg	760	--	--
618-9_Shallow_Focused	non-Rad	Hexachloroethane	67-72-1	µg/kg	17,000	--	--
618-9_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.49E+07	3.26E+07	No
618-9_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	7,700	10,200	No
618-9_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	359,000	512,000	No
618-9_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	330	13	Yes
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	--	--
618-9_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,600	19,100	No
618-9_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	1.67E+06	52,000	Yes
618-9_Shallow_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	920	--	--
618-9_Shallow_Focused	non-Rad	Toluene	108-88-3	µg/kg	9.0	--	--
618-9_Shallow_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	--	--
618-9_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	3,100	3,210	No
618-9_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	59,300	85,100	No
618-9_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	52,300	67,800	No
618-9_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.071	0.11	No
618-9_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	3.0	1.1	Yes
628-4_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,374	6,470	No
628-4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	61	--	--
628-4_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,284	10,200	No
628-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,308	3,210	No
628-4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.033	1.1	No
628-4_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.87	1.1	No
628-4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.78	1.1	No
628-4_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	42	--	--
628-4_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,115	--	--
628-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	243	--	--
628-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	38	--	--
628-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,864	6,470	No
628-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	99,167	10,200	Yes
628-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,163	3,210	No
628-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	1.1	Yes
628-4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.11	0.11	Yes
628-4_Shallow	Rad	Uranium-238	U-238	pCi/g	1.0	1.1	No
UPR-300-17_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	117	--	--

Table A-3. Comparison of EPCs for Waste Site Decision Units in 300 Area Source OU to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
UPR-300-17_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.34E+06	1.18E+07	No
UPR-300-17_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	7.0	--	--
UPR-300-17_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	359	130	Yes
UPR-300-17_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,970	--	--
UPR-300-17_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	450	--	--
UPR-300-17_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	113	--	--
UPR-300-17_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,573	6,470	No
UPR-300-17_Shallow	non-Rad	Barium	7440-39-3	µg/kg	81,014	132,000	No
UPR-300-17_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	59	--	--
UPR-300-17_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	44	--	--
UPR-300-17_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	33	--	--
UPR-300-17_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	9.9	--	--
UPR-300-17_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	240	1,510	No
UPR-300-17_Shallow	non-Rad	Boron	7440-42-8	µg/kg	3,903	3,890	Yes
UPR-300-17_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	173	563	No
UPR-300-17_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	13,795	18,500	No
UPR-300-17_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	39	--	--
UPR-300-17_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,688	15,700	No
UPR-300-17_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,135	22,000	No
UPR-300-17_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	35	--	--
UPR-300-17_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.9	--	--
UPR-300-17_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	5.9	--	--
UPR-300-17_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07	3.26E+07	No
UPR-300-17_Shallow	non-Rad	Lead	7439-92-1	µg/kg	11,240	10,200	Yes
UPR-300-17_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	285,159	512,000	No
UPR-300-17_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	69	13	Yes
UPR-300-17_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	412	470	No
UPR-300-17_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	48	--	--
UPR-300-17_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	563,654	19,100	Yes
UPR-300-17_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	34	--	--
UPR-300-17_Shallow	non-Rad	Silver	7440-22-4	µg/kg	340	167	Yes
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,950	--	--
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	210,420	--	--
UPR-300-17_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,420	3,210	Yes
UPR-300-17_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	52,150	85,100	No
UPR-300-17_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	157,172	67,800	Yes
UPR-300-17_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	6.1	1.1	Yes
UPR-300-17_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.91	0.11	Yes
UPR-300-17_Shallow	Rad	Uranium-238	U-238	pCi/g	4.0	1.1	Yes
UPR-300-46_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	13	--	--
UPR-300-46_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.80E+06	1.18E+07	No
UPR-300-46_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	381	130	Yes
UPR-300-46_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	879	--	--
UPR-300-46_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	490	--	--
UPR-300-46_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	84	--	--
UPR-300-46_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,846	6,470	No
UPR-300-46_Shallow	non-Rad	Barium	7440-39-3	µg/kg	82,137	132,000	No
UPR-300-46_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	3.9	--	--
UPR-300-46_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.4	--	--
UPR-300-46_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	5.4	--	--
UPR-300-46_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.8	--	--
UPR-300-46_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	222	1,510	No
UPR-300-46_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,714	3,890	No
UPR-300-46_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	95	563	No
UPR-300-46_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,173	18,500	No
UPR-300-46_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	5.6	--	--
UPR-300-46_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,361	15,700	No
UPR-300-46_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,151	22,000	No
UPR-300-46_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	1.3	--	--
UPR-300-46_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	9.6	--	--
UPR-300-46_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.2	--	--
UPR-300-46_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	7.6	--	--
UPR-300-46_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07	3.26E+07	No
UPR-300-46_Shallow	non-Rad	Lead	7439-92-1	µg/kg	7,105	10,200	No
UPR-300-46_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	311,001	512,000	No
UPR-300-46_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	29	13	Yes
UPR-300-46_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	456	470	No
UPR-300-46_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	36	--	--
UPR-300-46_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,230	19,100	No
UPR-300-46_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	4.4	--	--
UPR-300-46_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,897	3,210	Yes
UPR-300-46_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	53,808	85,100	No
UPR-300-46_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	47,945	67,800	No
UPR-300-46_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.070	1.1	No
UPR-300-46_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.8	1.1	Yes
UPR-300-46_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	0.11	Yes
UPR-300-46_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	1.1	Yes

Table A-4. Comparison of EPC from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
300 ASH PITS_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	52	91,112	No
300 ASH PITS_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	96	--[b]	--
300 ASH PITS_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	76	8.41E+06	No
300-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	13,500	37,999	No
300-10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	200	--[b]	--
300-10_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	230	8.41E+06	No
300-10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,078	101,630[c]	No
300-10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
300-109_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	122	--[b]	--
300-109_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	40	--[b]	--
300-109_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.2	--[b]	--
300-109_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	2.3	--[b]	--
300-109_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	1.8	--[b]	--
300-109_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	14	--[b]	--
300-109_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	22	1.41E+06	No
300-109_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	1.6	--[b]	--
300-109_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,108	101,630[c]	No
300-109_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	--[d]	--
300-109_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	37	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	19	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	2.1	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.3	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.3	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	5.1	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	29	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	µg/kg	7.0	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,450	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,877	101,630[c]	No
300-109_Staging Pile Area_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	2.5	--[d]	--
300-109_Staging Pile Area_Focused	Rad	Uranium-238	U-238	pCi/g	2.3	--[d]	--
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	120,000	2.00E+06[e]	No
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	230,000	2.00E+06[e]	No
300-23_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	52,000	2.00E+06[e]	No
300-259_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	322	270,034	No
300-259_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,876	101,630[c]	No
300-259_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	479,584	--[b]	--
300-259_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.6	--[d]	--
300-259_Shallow	Rad	Uranium-238	U-238	pCi/g	1.3	--[d]	--
300-260_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	922	270,034	No
300-260_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	8,360	1.08E+08	No
300-260_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	73,300	2.41E+08	No
300-260_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	18,300	1.06E+07	No
300-260_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	537	2.58E+07	No
300-260_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	206	--[b]	--
300-260_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,800	101,630[c]	No
300-260_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	77,400	--[b]	--
300-260_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.25	--[d]	--
300-260_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	4.3	--[d]	--
300-272_Overburden_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	13,100	2.00E+06[e]	No
300-272_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	43,100	2.00E+06[e]	No
300-275_Shallow_1	non-Rad	Acenaphthene	83-32-9	µg/kg	960	7.38E+07	No
300-275_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	260	270,034	No
300-275_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.3	--[b]	--
300-275_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.9	--[b]	--
300-275_Shallow_1	non-Rad	Chrysene	218-01-9	µg/kg	2.2	--[b]	--
300-275_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	42,923	2.41E+08	No
300-275_Shallow_1	non-Rad	Fluoranthene	206-44-0	µg/kg	2,300	--[b]	--
300-275_Shallow_1	non-Rad	Fluorene	86-73-7	µg/kg	81	6.17E+07	No
300-275_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	17	1.41E+06	No
300-275_Shallow_1	non-Rad	Strontium	7440-24-6	µg/kg	20,196	--[b]	--
300-275_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,483	--[b]	--
300-275_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	7.7	--[d]	--
300-275_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.0	--[d]	--
300-275_Shallow_1	Rad	Uranium-238	U-238	pCi/g	7.4	--[d]	--
300-275_Shallow_2	non-Rad	Acenaphthene	83-32-9	µg/kg	3.6	7.38E+07	No
300-275_Shallow_2	non-Rad	Fluoranthene	206-44-0	µg/kg	56	--[b]	--
300-275_Shallow_2	non-Rad	Fluorene	86-73-7	µg/kg	2.6	6.17E+07	No
300-275_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	28	1.41E+06	No
300-275_Shallow_2	non-Rad	Strontium	7440-24-6	µg/kg	27,081	--[b]	--
300-275_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,149	--[b]	--
300-275_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,725	101,630[c]	No
300-275_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
300-275_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
300-275_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.2	--[d]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1016	12674-11-2	µg/kg	10	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	16	97,738	No
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	190	91,112	No
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	84	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	17	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	228	8.41E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	16	1.41E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	2.9	2,098	No

Table A-4. Comparison of EPC from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
300-33, 300-41, 300-256_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	486	2.58E+07	No
300-33, 300-41, 300-256_Shallow	non-Rad	Silver	7440-22-4	µg/kg	782	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	7,260	101,630[c]	No
300-33, 300-41, 300-256_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.1	--[d]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.34	--[d]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-238	U-238	pCi/g	2.1	--[d]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	330	91,112	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	385	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2.2	2,098	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,460	101,630[c]	No
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	3.0	--[d]	--
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	2.2	--[d]	--
300-37_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	100	--[b]	--
300-37_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,200	--[b]	--
300-44_Overburden_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	9,100	37,999	No
300-44_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	4,100	270,034	No
300-44_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	16,900	37,999	No
300-45_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	86	--[b]	--
300-45_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	290	--[b]	--
300-45_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,600	101,630[c]	No
300-45_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2	--[d]	--
300-49_Overburden	non-Rad	1,2,4-Trichlorobenzene	120-82-1	µg/kg	31	28,655	No
300-49_Overburden	non-Rad	1,4-Dichlorobenzene	106-46-7	µg/kg	29	61,744	No
300-49_Overburden	non-Rad	2,4-Dinitrotoluene	121-14-2	µg/kg	19	402	No
300-49_Overburden	non-Rad	2-Chlorophenol	95-57-8	µg/kg	51	194,372	No
300-49_Overburden	non-Rad	4-Chloro-3-methylphenol	59-50-7	µg/kg	46	9.78E+06	No
300-49_Overburden	non-Rad	Acenaphthene	83-32-9	µg/kg	31	7.38E+07	No
300-49_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	232	270,034	No
300-49_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,008	--[b]	--
300-49_Overburden	non-Rad	Copper	7440-50-8	µg/kg	536,000	2.41E+08	No
300-49_Overburden	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	52	2.85E+07	No
300-49_Overburden	non-Rad	Lead	7439-92-1	µg/kg	36,964	1.06E+07	No
300-49_Overburden	non-Rad	n-Nitrosodi-n-dipropylamine	621-64-7	µg/kg	40	330	No
300-49_Overburden	non-Rad	Pentachlorophenol	87-86-5	µg/kg	50	5,346	No
300-49_Overburden	non-Rad	Phenol	108-95-2	µg/kg	50	1.49E+06	No
300-49_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	40	--[b]	--
300-49_Overburden	non-Rad	Silver	7440-22-4	µg/kg	703	--[b]	--
300-49_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	141,984	--[b]	--
300-49_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	176	270,034	No
300-49_Shallow	non-Rad	Silver	7440-22-4	µg/kg	621	--[b]	--
300-49_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
300-49_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
300-49_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
300-50_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	33	--[b]	--
300-50_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	229	--[b]	--
300-50_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	6,897	37,999	No
300-50_Overburden	non-Rad	Copper	7440-50-8	µg/kg	64,527	2.41E+08	No
300-50_Overburden	non-Rad	Silver	7440-22-4	µg/kg	1,202	--[b]	--
300-50_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	17,919	101,630[c]	No
300-50_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	6.0	--[d]	--
300-50_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.45	--[d]	--
300-50_Overburden	Rad	Uranium-238	U-238	pCi/g	6.0	--[d]	--
300-50_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	3,000	270,034	No
300-50_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	126	--[b]	--
300-50_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	19	--[b]	--
300-50_Shallow	non-Rad	Silver	7440-22-4	µg/kg	2,992	--[b]	--
300-50_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	22,938	101,630[c]	No
300-50_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	7.9	--[d]	--
300-50_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.66	--[d]	--
300-50_Shallow	Rad	Uranium-238	U-238	pCi/g	8.4	--[d]	--
316-1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	40,572	101,630[c]	No
316-1_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.32	--[b]	--
316-1_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	13	--[d]	--
316-1_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
316-1_Overburden	Rad	Uranium-238	U-238	pCi/g	13	--[d]	--
316-1_Shallow_1	non-Rad	Aroclor-1248	12672-29-6	µg/kg	3,000	91,112	No
316-1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	19,014	37,999	No
316-1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	69	--[b]	--
316-1_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	98	8.41E+06	No
316-1_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	83,027	101,630[c]	No
316-1_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.2	--[d]	--
316-1_Shallow_1	Rad	Uranium-238	U-238	pCi/g	28	--[d]	--
316-1_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	490	270,034	No
316-1_Shallow_3	non-Rad	Aroclor-1254	11097-69-1	µg/kg	98	--[b]	--
316-1_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	342	--[b]	--
316-1_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	50,455	--[b]	--
316-1_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	1.37E+06	2.41E+08	No
316-1_Shallow_3	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	3.2	--[b]	--
316-1_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	14,409	1.06E+07	No
316-1_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	1,105	1.41E+06	No
316-1_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	94,656	--[b]	--
316-1_Shallow_3	non-Rad	Phenol	108-95-2	µg/kg	28	1.49E+06	No
316-1_Shallow_3	non-Rad	Selenium	7782-49-2	µg/kg	1,444	3.02E+06	No

Table A-4. Comparison of EPC from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
316-1_Shallow_3	non-Rad	Silver	7440-22-4	µg/kg	13,196	--[b]	--
316-1_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	63,074	101,630[c]	No
316-1_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	82,016	--[b]	--
316-1_Shallow_3	Rad	Cobalt-60	10198-40-0	pCi/g	2.3	--[b]	--
316-1_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	23	--[d]	--
316-1_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	2.6	--[d]	--
316-1_Shallow_3	Rad	Uranium-238	U-238	pCi/g	21	--[d]	--
316-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	µg/kg	62	--[b]	--
316-1_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	42,963	101,630[c]	No
316-1_Shallow_4	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--
316-1_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	16	--[d]	--
316-1_Shallow_4	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
316-1_Shallow_4	Rad	Uranium-238	U-238	pCi/g	14	--[d]	--
316-2_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	210,452	101,630[c]	Yes
316-2_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.092	--[b]	--
316-2_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	86	--[d]	--
316-2_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	12	--[d]	--
316-2_Shallow_1	Rad	Uranium-238	U-238	pCi/g	69	--[d]	--
316-2_Shallow_2	non-Rad	Aroclor-1248	12672-29-6	µg/kg	697	91,112	No
316-2_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	µg/kg	42	--[b]	--
316-2_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	110	--[b]	--
316-2_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	291,369	101,630[c]	Yes
316-2_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.45	--[b]	--
316-2_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	115	--[d]	--
316-2_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	11	--[d]	--
316-2_Shallow_2	Rad	Uranium-238	U-238	pCi/g	96	--[d]	--
316-2_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	8,000	37,999	No
316-2_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	260	--[b]	--
316-2_Shallow_3	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	180	8.41E+06	No
316-2_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	73,174	101,630[c]	No
316-2_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.91	--[d]	--
316-2_Shallow_3	Rad	Uranium-238	U-238	pCi/g	24	--[d]	--
316-5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	38	--[b]	--
316-5_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	146	--[b]	--
316-5_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	100	8.41E+06	No
316-5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	271,835	101,630[c]	Yes
316-5_Shallow_1	Rad	Americium-241	14596-10-2	pCi/g	0.48	--[b]	--
316-5_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	2.3	--[b]	--
316-5_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	19	--[d]	--
316-5_Shallow_1	Rad	Uranium-238	U-238	pCi/g	89	--[d]	--
316-5_Shallow_2	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	140	270	No
316-5_Shallow_2	non-Rad	2-Butoxyethanol	111-76-2	µg/kg	240	251,308	No
316-5_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	180	--[b]	--
316-5_Shallow_2	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	110	8.41E+06	No
316-5_Shallow_2	non-Rad	Chrysene	218-01-9	µg/kg	38	--[b]	--
316-5_Shallow_2	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	146	2.85E+07	No
316-5_Shallow_2	non-Rad	Silver	7440-22-4	µg/kg	3,600	--[b]	--
316-5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	204,701	101,630[c]	Yes
316-5_Shallow_2	Rad	Americium-241	14596-10-2	pCi/g	0.12	--[b]	--
316-5_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	1.7	--[b]	--
316-5_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--
316-5_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	9.0	--[d]	--
316-5_Shallow_2	Rad	Uranium-238	U-238	pCi/g	68	--[d]	--
316-5_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	57	91,112	No
316-5_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	70	--[b]	--
316-5_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--[b]	--
316-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	190	--[b]	--
316-5_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	1,500	2.85E+07	No
316-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	138,095	101,630[c]	Yes
316-5_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.8	--[b]	--
316-5_Shallow_Focused	Rad	Europium-155	14391-16-3	pCi/g	0.072	--[b]	--
316-5_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	7.7	--[d]	--
316-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	45	--[d]	--
331 LSLDF_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	25	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	590	2.23E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	0.56	7,793	No
331 LSLDF_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	µg/kg	0.39	285	No
331 LSLDF_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	360	270,034	No
331 LSLDF_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	850	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	910	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	340	8.41E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Dieldrin	60-57-1	µg/kg	13	2,733	No
331 LSLDF_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	98	2.85E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan I	959-98-8	µg/kg	1.9	2.46E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	µg/kg	3.1	2.46E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	110	1.41E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	µg/kg	3.3	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	11	2,098	No
331 LSLDF_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	590	2.58E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	9,500	3.03E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,100	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	137,000	--[b]	--
600-243_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	µg/kg	279	1.07E+06	No

Table A-4. Comparison of EPC from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
600-243_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	31	--[b]	--
600-243_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	1,300	270,034	No
600-243_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	27	--[b]	--
600-243_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	18	--[b]	--
600-243_Shallow	non-Rad	Barium	7440-39-3	µg/kg	292,072	--[b]	--
600-243_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	43	--[b]	--
600-243_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	43	--[b]	--
600-243_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	46	--[b]	--
600-243_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	32	--[b]	--
600-243_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	2,079	--[b]	--
600-243_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	432	--[b]	--
600-243_Shallow	non-Rad	Boron	7440-42-8	µg/kg	294,463	1.08E+08	No
600-243_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	793	3.52E+06	No
600-243_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	63	--[b]	--
600-243_Shallow	non-Rad	Copper	7440-50-8	µg/kg	53,981	2.41E+08	No
600-243_Shallow	non-Rad	Dibenzofuran	132-64-9	µg/kg	78	2.32E+06	No
600-243_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	37	2.85E+07	No
600-243_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	79	--[b]	--
600-243_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	28	--[b]	--
600-243_Shallow	non-Rad	Lead	7439-92-1	µg/kg	40,139	1.06E+07	No
600-243_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	1,869	2.58E+07	No
600-243_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	204	2.26E+06	No
600-243_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	21,395	--[b]	--
600-243_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	70	--[b]	--
600-243_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	5,709	3.02E+06	No
600-243_Shallow	non-Rad	Silver	7440-22-4	µg/kg	500	--[b]	--
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	95,319	2.00E+06[e]	No
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	334,524	2.00E+06[e]	No
600-243_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	84,099	--[b]	--
600-47_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,303	101,630[c]	No
600-47_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	--[d]	--
600-47_Shallow	Rad	Uranium-238	U-238	pCi/g	1.6	--[d]	--
618-1_Deep	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,760	--[b]	--
618-1_Deep	non-Rad	Aroclor-1260	11096-82-5	µg/kg	294	--[b]	--
618-1_Deep	non-Rad	Barium	7440-39-3	µg/kg	299,000	--[b]	--
618-1_Deep	non-Rad	Copper	7440-50-8	µg/kg	46,300	2.41E+08	No
618-1_Deep	non-Rad	Lead	7439-92-1	µg/kg	58,400	1.06E+07	No
618-1_Deep	non-Rad	Mercury	7439-97-6	µg/kg	1,180	1.41E+06	No
618-1_Deep	non-Rad	Molybdenum	7439-98-7	µg/kg	493	2.58E+07	No
618-1_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	220	3.03E+06	No
618-1_Deep	non-Rad	Uranium	7440-61-1	µg/kg	37,400	101,630[c]	No
618-1_Deep	non-Rad	Zinc	7440-66-6	µg/kg	134,000	--[b]	--
618-1_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	33	--[d]	--
618-1_Deep	Rad	Uranium-235	15117-96-1	pCi/g	2.7	--[d]	--
618-1_Deep	Rad	Uranium-238	U-238	pCi/g	32	--[d]	--
618-1_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	407	270,034	No
618-1_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1.24E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	99	--[b]	--
618-1_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	1.87E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Boron	7440-42-8	µg/kg	6,620	1.08E+08	No
618-1_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,030	3.52E+06	No
618-1_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	18,900	--[b]	--
618-1_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	68,700	2.41E+08	No
618-1_Deep_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	3,300	--[b]	--
618-1_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	333,000	1.06E+07	No
618-1_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	8,940	1.41E+06	No
618-1_Deep_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	2,140	2.58E+07	No
618-1_Deep_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,560	3.03E+06	No
618-1_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,290	--[b]	--
618-1_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	209,000	101,630[c]	Yes
618-1_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	82,000	--[b]	--
618-1_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	6.5	--[b]	--
618-1_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	70	--[d]	--
618-1_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.5	--[d]	--
618-1_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	65	--[d]	--
618-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	264	--[b]	--
618-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	54	--[b]	--
618-1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	31	1.41E+06	No
618-1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	300	3.03E+06	No
618-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,224	101,630[c]	No
618-1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	--[d]	--
618-1_Shallow	Rad	Uranium-238	U-238	pCi/g	1.5	--[d]	--
618-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	1.22E+07	--[b]	--
618-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	455	270,034	No
618-1_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	35	91,112	No
618-1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	981	--[b]	--
618-1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	56	--[b]	--
618-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	19,500	--[b]	--
618-1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	23,800	2.41E+08	No
618-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	198	1.41E+06	No
618-1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	260	3.03E+06	No
618-1_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,120	--[b]	--
618-1_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	7,080	101,630[c]	No
618-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	68,100	--[b]	--

Table A-4. Comparison of EPC from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-1_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-1_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.99	--[d]	--
618-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	8.2	--[d]	--
618-12_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	8,557	37,999	No
618-12_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	63	--[b]	--
618-12_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	60	8.41E+06	No
618-12_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	32,092	101,630[c]	No
618-12_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.47	--[d]	--
618-12_Shallow	Rad	Uranium-238	U-238	pCi/g	11	--[d]	--
618-13_Shallow	non-Rad	Acetone	67-64-1	µg/kg	8.6	2.23E+06	No
618-13_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	312	270,034	No
618-13_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	5.1	2,098	No
618-13_Shallow	non-Rad	Tin	7440-31-5	µg/kg	1,050	--[b]	--
618-13_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	--[d]	--
618-13_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
618-13_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	5.9	2.23E+06	No
618-13_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	233	270,034	No
618-13_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	150	6,000[f]	No
618-13_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	5.0	2,098	No
618-13_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	745	--[b]	--
618-13_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
618-2_Deep	non-Rad	Tin	7440-31-5	µg/kg	2,900	--[b]	--
618-2_Deep	non-Rad	Uranium	7440-61-1	µg/kg	501,000	101,630[c]	Yes
618-2_Deep	Rad	Americium-241	14596-10-2	pCi/g	7.9	--[b]	--
618-2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	1.5	--[b]	--
618-2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	91	--[b]	--
618-2_Deep	Rad	Plutonium-241	14119-32-5	pCi/g	42	--[b]	--
618-2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	12	227,428	No
618-2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	161	--[d]	--
618-2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.78	--[d]	--
618-2_Deep	Rad	Uranium-238	U-238	pCi/g	165	--[d]	--
618-2_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	6.9	--[b]	--
618-2_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	27	--[b]	--
618-2_Deep_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	18	2.85E+07	No
618-2_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	1,200	3.02E+06	No
618-2_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	600	--[b]	--
618-2_Deep_Focused	non-Rad	Tin	7440-31-5	µg/kg	42,500	--[b]	--
618-2_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	148,000	101,630[c]	Yes
618-2_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	9.2	--[b]	--
618-2_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.1	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-238	13981-16-3	pCi/g	1.6	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	92	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-241	14119-32-5	pCi/g	33	--[b]	--
618-2_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	7.2	227,428	No
618-2_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	48	--[d]	--
618-2_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	2.4	--[d]	--
618-2_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	50	--[d]	--
618-2_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	1,000	3.02E+06	No
618-2_Overburden	non-Rad	Tin	7440-31-5	µg/kg	2,700	--[b]	--
618-2_Shallow	non-Rad	Tin	7440-31-5	µg/kg	2,400	--[b]	--
618-2_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	4,530	101,630[c]	No
618-2_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.81	--[b]	--
618-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.2	--[b]	--
618-2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	7.7	--[b]	--
618-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.2	--[d]	--
618-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.21	--[d]	--
618-2_Shallow	Rad	Uranium-238	U-238	pCi/g	2.2	--[d]	--
618-2_Staging Pile	non-Rad	Uranium	7440-61-1	µg/kg	5,022	101,630[c]	No
618-2_Staging Pile	Rad	Americium-241	14596-10-2	pCi/g	0.82	--[b]	--
618-2_Staging Pile	Rad	Plutonium-239/240	PU-239/240	pCi/g	10	--[b]	--
618-2_Staging Pile	Rad	Tritium	10028-17-8	pCi/g	2.3	9,176	No
618-2_Staging Pile	Rad	Uranium-233/234	U-233/234	pCi/g	2.0	--[d]	--
618-2_Staging Pile	Rad	Uranium-235	15117-96-1	pCi/g	0.12	--[d]	--
618-2_Staging Pile	Rad	Uranium-238	U-238	pCi/g	2.0	--[d]	--
618-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	238,577	101,630[c]	Yes
618-3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	80	--[d]	--
618-3_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.8	--[d]	--
618-3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	79	--[d]	--
618-4_Deep	non-Rad	Lead	7439-92-1	µg/kg	20,000	1.06E+07	No
618-4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	64,506	101,630[c]	No
618-4_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	20	--[d]	--
618-4_Deep	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
618-4_Deep	Rad	Uranium-238	U-238	pCi/g	22	--[d]	--
618-4_Deep_Focused	non-Rad	2-Butanone	78-93-3	µg/kg	130	1.67E+06	No
618-4_Deep_Focused	non-Rad	Acetone	67-64-1	µg/kg	16	2.23E+06	No
618-4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,600	--[b]	--
618-4_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	4,700	--[b]	--
618-4_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,500	3.52E+06	No
618-4_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	27,700	--[b]	--
618-4_Deep_Focused	non-Rad	Diethyl ether	60-29-7	µg/kg	1.0	664,052	No
618-4_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	24,900	1.06E+07	No
618-4_Deep_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	40	2,098	No
618-4_Deep_Focused	non-Rad	Phenol	108-95-2	µg/kg	110	1.49E+06	No

Table A-4. Comparison of EPC from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-4_Deep_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	24	275	No
618-4_Deep_Focused	non-Rad	Toluene	108-88-3	µg/kg	4.8	1.15E+06	No
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	34,000	2.00E+06[e]	No
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - kerosene range	TPHKEROSENE	µg/kg	42,000	2.00E+06[e]	No
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	65	2.00E+06[e]	No
618-4_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	20,777	101,630[c]	No
618-4_Deep_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	690	No
618-4_Deep_Focused	non-Rad	Trichloromonofluoromethane	75-69-4	µg/kg	12	1.95E+06	No
618-4_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	7.2	--[d]	--
618-4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.51	--[d]	--
618-4_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	6.9	--[d]	--
618-4_Overburden_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,197	101,630[c]	No
618-4_Overburden_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
618-4_Overburden_2	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
618-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	49,000	1.06E+07	No
618-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	7,456	101,630[c]	No
618-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	3.2	--[d]	--
618-4_Shallow	Rad	Uranium-238	U-238	pCi/g	3.1	--[d]	--
618-5_Deep	non-Rad	Lead	7439-92-1	µg/kg	82,300	1.06E+07	No
618-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	26,618	101,630[c]	No
618-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	8.6	--[d]	--
618-5_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.46	--[d]	--
618-5_Deep	Rad	Uranium-238	U-238	pCi/g	8.9	--[d]	--
618-5_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	1,800	270,034	No
618-5_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	579,000	--[b]	--
618-5_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	33	1.41E+06	No
618-5_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	2,270	3.02E+06	No
618-5_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	36,540	101,630[c]	No
618-5_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-5_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.48	--[d]	--
618-5_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	12	--[d]	--
618-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	9,773	101,630[c]	No
618-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	4.1	--[d]	--
618-5_Overburden	Rad	Uranium-238	U-238	pCi/g	4.6	--[d]	--
618-5_Staging Pile_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,364	101,630[c]	No
618-5_Staging Pile_4	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	--[d]	--
618-5_Staging Pile_4	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
618-5_Staging Pile_5	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,326	101,630[c]	No
618-5_Staging Pile_5	Rad	Uranium-233/234	U-233/234	pCi/g	1.5	--[d]	--
618-5_Staging Pile_5	Rad	Uranium-235	15117-96-1	pCi/g	0.17	--[d]	--
618-5_Staging Pile_5	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
618-7_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	560	270,034	No
618-7_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	14,567	1.06E+07	No
618-7_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	44	1.41E+06	No
618-7_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	20,977	--[b]	--
618-7_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,547	--[b]	--
618-7_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	10,814	101,630[c]	No
618-7_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	3.6	--[d]	--
618-7_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	0.36	--[d]	--
618-7_Shallow_1	Rad	Uranium-238	U-238	pCi/g	3.6	--[d]	--
618-7_Shallow_2	non-Rad	Antimony	7440-36-0	µg/kg	660	270,034	No
618-7_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	20	1.41E+06	No
618-7_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,500	--[b]	--
618-7_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	450	270,034	No
618-7_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	20	1.41E+06	No
618-7_Shallow_3	non-Rad	Tin	7440-31-5	µg/kg	1,800	--[b]	--
618-7_Shallow_4	non-Rad	Antimony	7440-36-0	µg/kg	250	270,034	No
618-7_Shallow_4	non-Rad	Tin	7440-31-5	µg/kg	710	--[b]	--
618-7_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	150	7.38E+07	No
618-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	980	270,034	No
618-7_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	6.7	91,112	No
618-7_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	88	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	66	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	52	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	11	--[b]	--
618-7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	470	--[b]	--
618-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	6,200	3.52E+06	No
618-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	65,900	--[b]	--
618-7_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	69	--[b]	--
618-7_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	25,000	2.41E+08	No
618-7_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	45	--[b]	--
618-7_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	33	2.85E+07	No
618-7_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	48	--[b]	--
618-7_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	20	1.41E+06	No
618-7_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	410	--[b]	--
618-7_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,200	--[b]	--
618-7_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	680,000	2.00E+06[e]	No
618-7_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	19,563	101,630[c]	No
618-7_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-7_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.97	--[d]	--
618-7_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	6.4	--[d]	--
618-8_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	846	3.02E+06	No
618-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	--[d]	--
618-9_Shallow_Focused	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	110	270	No

Table A-4. Comparison of EPC from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?
618-9_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	680	2.23E+06	No
618-9_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	390	7,793	No
618-9_Shallow_Focused	non-Rad	Aroclor-1016	12674-11-2	µg/kg	1,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1221	11104-28-2	µg/kg	1,900	5,773	No
618-9_Shallow_Focused	non-Rad	Aroclor-1232	11141-16-5	µg/kg	1,900	5,773	No
618-9_Shallow_Focused	non-Rad	Aroclor-1242	53469-21-9	µg/kg	1,900	97,738	No
618-9_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,900	91,112	No
618-9_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	11,600	37,999	No
618-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	5,200	--[b]	--
618-9_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	2,700	8.41E+06	No
618-9_Shallow_Focused	non-Rad	Chlordane	57-74-9	µg/kg	69	--[b]	--
618-9_Shallow_Focused	non-Rad	Chloroform	67-66-3	µg/kg	9.0	1,289	No
618-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	7,200	2.85E+07	No
618-9_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	44	--[b]	--
618-9_Shallow_Focused	non-Rad	Hexachlorobutadiene	87-68-3	µg/kg	760	--[b]	--
618-9_Shallow_Focused	non-Rad	Hexachloroethane	67-72-1	µg/kg	17,000	65,103	No
618-9_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	330	1.41E+06	No
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	2,098	Yes
618-9_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	1.67E+06	1.36E+07	No
618-9_Shallow_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	920	275	Yes
618-9_Shallow_Focused	non-Rad	Toluene	108-88-3	µg/kg	9.0	1.15E+06	No
618-9_Shallow_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	690	No
618-9_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	3.0	--[d]	--
628-4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	61	--[b]	--
628-4_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	42	97,738	No
628-4_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,115	91,112	No
628-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	243	--[b]	--
628-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	38	--[b]	--
628-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	99,167	1.06E+07	No
628-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
628-4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.11	--[d]	--
UPR-300-17_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	117	7.38E+07	No
UPR-300-17_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	7.0	--[b]	--
UPR-300-17_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	359	270,034	No
UPR-300-17_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,970	91,112	No
UPR-300-17_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	450	--[b]	--
UPR-300-17_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	113	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	59	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	44	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	33	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	9.9	--[b]	--
UPR-300-17_Shallow	non-Rad	Boron	7440-42-8	µg/kg	3,903	1.08E+08	No
UPR-300-17_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	39	--[b]	--
UPR-300-17_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	35	--[b]	--
UPR-300-17_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.9	6.17E+07	No
UPR-300-17_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	5.9	--[b]	--
UPR-300-17_Shallow	non-Rad	Lead	7439-92-1	µg/kg	11,240	1.06E+07	No
UPR-300-17_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	69	1.41E+06	No
UPR-300-17_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	48	2.26E+06	No
UPR-300-17_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	563,654	--[b]	--
UPR-300-17_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	34	--[b]	--
UPR-300-17_Shallow	non-Rad	Silver	7440-22-4	µg/kg	340	--[b]	--
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,950	2.00E+06[e]	No
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	210,420	2.00E+06[e]	No
UPR-300-17_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,420	101,630[c]	No
UPR-300-17_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	157,172	--[b]	--
UPR-300-17_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	6.1	--[d]	--
UPR-300-17_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.91	--[d]	--
UPR-300-17_Shallow	Rad	Uranium-238	U-238	pCi/g	4.0	--[d]	--
UPR-300-46_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	13	7.38E+07	No
UPR-300-46_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	381	270,034	No
UPR-300-46_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	879	91,112	No
UPR-300-46_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	490	--[b]	--
UPR-300-46_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	84	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	3.9	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	5.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.8	--[b]	--
UPR-300-46_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	5.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	1.3	--[b]	--
UPR-300-46_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	9.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.2	6.17E+07	No
UPR-300-46_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	7.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	29	1.41E+06	No
UPR-300-46_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	36	2.26E+06	No
UPR-300-46_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	4.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,897	101,630[c]	No
UPR-300-46_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.8	--[d]	--
UPR-300-46_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
UPR-300-46_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--

Notes:

a. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

Table A-4. Comparison of EPC from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection[a]	Is EPC > Soil Screening Level Protective of Groundwater?

b. The calculated soil screening level for the analyte is considered non-representative because: (1) breakthrough is simulated within 1,000 years for some soil columns while other soil columns (a majority) show no breakthrough (breakthrough defined as concentrations below 1E-04 µg/L or activity below 1E-04 pCi/L), and/or (2) the calculated residual mass of contaminant in the pore volume is high enough to represent a substantial (and physically improbable) reduction in porosity.

c. Due to the complex geochemistry of uranium in 300 Area source operable unit soils, uranium SSLs were derived using a site-speicific two-dimensional model as described in ECF-300FF5-11-0151.

d. Uranium isotopes are accounted for by converting from activity-based (pCi/g) to mass-based (µg/kg) concentrations and then summing to provide a mass-based total uranium exposure point concentration (identified as Total_U_Isotopes), as described in ECF-300NPL-11-0137, Computation of Exposure Point Concentrations for the 300-FF-2 Source Operable Unit.

e. The soil screening level for Total Petroleum Hydrocarbons is a default screening level obtained from WAC 173-340-900, Table 747-5, "Residual Saturation Screening Levels for TPH."

f. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

-- = Not applicable or no value

Table A-5. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300 ASH PITS_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	52	133	No
300 ASH PITS_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	96	--[b]	--
300 ASH PITS_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	76	1.50E+06	No
300-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	13,500	11,726	Yes
300-10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	200	--[b]	--
300-10_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	230	1.50E+06	No
300-10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,078	2.64E+06[c]	No
300-10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
300-109_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	122	--[b]	--
300-109_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	40	--[b]	--
300-109_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.2	--[b]	--
300-109_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	2.3	--[b]	--
300-109_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	1.8	--[b]	--
300-109_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	14	--[b]	--
300-109_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	22	8,451	No
300-109_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	1.6	--[b]	--
300-109_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,108	2.64E+06[c]	No
300-109_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	--[d]	--
300-109_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	37	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	19	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	2.1	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.3	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.3	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	5.1	2.82E+08	No
300-109_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	29	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	µg/kg	7.0	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,450	--[b]	--
300-109_Staging Pile Area_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,877	2.64E+06[c]	No
300-109_Staging Pile Area_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	2.5	--[d]	--
300-109_Staging Pile Area_Focused	Rad	Uranium-238	U-238	pCi/g	2.3	--[d]	--
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	120,000	--[e]	--
300-223_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	230,000	--[e]	--
300-23_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	52,000	--[e]	--
300-259_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	322	252,032	No
300-259_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,876	2.64E+06[c]	No
300-259_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	479,584	6.41E+07	No
300-259_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.6	--[d]	--
300-259_Shallow	Rad	Uranium-238	U-238	pCi/g	1.3	--[d]	--
300-260_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	922	252,032	No
300-260_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	8,360	--[e]	--
300-260_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	73,300	3.40E+06	No
300-260_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	18,300	1.48E+06	No
300-260_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	537	--[b]	--
300-260_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	206	--[b]	--
300-260_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,800	2.64E+06[c]	No
300-260_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	77,400	6.41E+07	No
300-260_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.25	--[d]	--
300-260_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	4.3	--[d]	--
300-272_Overburden_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	13,100	--[e]	--
300-272_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	43,100	--[e]	--
300-275_Shallow_1	non-Rad	Acenaphthene	83-32-9	µg/kg	960	4.94E+07	No
300-275_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	260	252,032	No
300-275_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.3	--[b]	--
300-275_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1.9	--[b]	--
300-275_Shallow_1	non-Rad	Chrysene	218-01-9	µg/kg	2.2	--[b]	--
300-275_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	42,923	3.40E+06	No
300-275_Shallow_1	non-Rad	Fluoranthene	206-44-0	µg/kg	2,300	2.82E+08	No
300-275_Shallow_1	non-Rad	Fluorene	86-73-7	µg/kg	81	1.06E+08	No
300-275_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	17	8,451	No
300-275_Shallow_1	non-Rad	Strontium	7440-24-6	µg/kg	20,196	--[b]	--
300-275_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,483	--[b]	--
300-275_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	7.7	--[d]	--
300-275_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.0	--[d]	--
300-275_Shallow_1	Rad	Uranium-238	U-238	pCi/g	7.4	--[d]	--
300-275_Shallow_2	non-Rad	Acenaphthene	83-32-9	µg/kg	3.6	4.94E+07	No
300-275_Shallow_2	non-Rad	Fluoranthene	206-44-0	µg/kg	56	2.82E+08	No
300-275_Shallow_2	non-Rad	Fluorene	86-73-7	µg/kg	2.6	1.06E+08	No
300-275_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	28	8,451	No
300-275_Shallow_2	non-Rad	Strontium	7440-24-6	µg/kg	27,081	--[b]	--
300-275_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,149	--[b]	--
300-275_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,725	2.64E+06[c]	No
300-275_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
300-275_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
300-275_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.2	--[d]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1016	12674-11-2	µg/kg	10	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	16	143	No
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	190	133	Yes
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	84	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	17	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	228	1.50E+06	No
300-33, 300-41, 300-256_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	16	8,451	No
300-33, 300-41, 300-256_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	2.9	1,931	No

Table A-5. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
300-33, 300-41, 300-256_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	486	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Silver	7440-22-4	µg/kg	782	--[b]	--
300-33, 300-41, 300-256_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	7,260	2.64E+06[c]	No
300-33, 300-41, 300-256_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.1	--[d]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.34	--[d]	--
300-33, 300-41, 300-256_Shallow	Rad	Uranium-238	U-238	pCi/g	2.1	--[d]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	330	133	Yes
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	385	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--[b]	--
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2.2	1,931	No
300-33, 300-41, 300-256_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	6,460	2.64E+06[c]	No
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	3.0	--[d]	--
300-33, 300-41, 300-256_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	2.2	--[d]	--
300-37_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	100	--[b]	--
300-37_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,200	--[b]	--
300-44_Overburden_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	9,100	11,726	No
300-44_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	4,100	252,032	No
300-44_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	16,900	11,726	Yes
300-45_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	86	--[b]	--
300-45_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	290	--[b]	--
300-45_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,600	2.64E+06[c]	No
300-45_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2	--[d]	--
300-49_Overburden	non-Rad	1,2,4-Trichlorobenzene	120-82-1	µg/kg	31	37,238	No
300-49_Overburden	non-Rad	1,4-Dichlorobenzene	106-46-7	µg/kg	29	164,520	No
300-49_Overburden	non-Rad	2,4-Dinitrotoluene	121-14-2	µg/kg	19	330	No
300-49_Overburden	non-Rad	2-Chlorophenol	95-57-8	µg/kg	51	393,603	No
300-49_Overburden	non-Rad	4-Chloro-3-methylphenol	59-50-7	µg/kg	46	1.87E+08	No
300-49_Overburden	non-Rad	Acenaphthene	83-32-9	µg/kg	31	4.94E+07	No
300-49_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	232	252,032	No
300-49_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,008	--[b]	--
300-49_Overburden	non-Rad	Copper	7440-50-8	µg/kg	536,000	3.40E+06	No
300-49_Overburden	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	52	3.56E+07	No
300-49_Overburden	non-Rad	Lead	7439-92-1	µg/kg	36,964	1.48E+06	No
300-49_Overburden	non-Rad	n-Nitrosodi-n-dipropylamine	621-64-7	µg/kg	40	330	No
300-49_Overburden	non-Rad	Pentachlorophenol	87-86-5	µg/kg	50	1,980	No
300-49_Overburden	non-Rad	Phenol	108-95-2	µg/kg	50	6.21E+06	No
300-49_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	40	--[b]	--
300-49_Overburden	non-Rad	Silver	7440-22-4	µg/kg	703	--[b]	--
300-49_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	141,984	6.41E+07	No
300-49_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	176	252,032	No
300-49_Shallow	non-Rad	Silver	7440-22-4	µg/kg	621	--[b]	--
300-49_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
300-49_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
300-49_Shallow	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
300-50_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	33	--[b]	--
300-50_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	229	--[b]	--
300-50_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	6,897	11,726	No
300-50_Overburden	non-Rad	Copper	7440-50-8	µg/kg	64,527	3.40E+06	No
300-50_Overburden	non-Rad	Silver	7440-22-4	µg/kg	1,202	--[b]	--
300-50_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	17,919	2.64E+06[c]	No
300-50_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	6.0	--[d]	--
300-50_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.45	--[d]	--
300-50_Overburden	Rad	Uranium-238	U-238	pCi/g	6.0	--[d]	--
300-50_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	3,000	252,032	No
300-50_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	126	--[b]	--
300-50_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	19	--[b]	--
300-50_Shallow	non-Rad	Silver	7440-22-4	µg/kg	2,992	--[b]	--
300-50_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	22,938	2.64E+06[c]	No
300-50_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	7.9	--[d]	--
300-50_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.66	--[d]	--
300-50_Shallow	Rad	Uranium-238	U-238	pCi/g	8.4	--[d]	--
316-1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	40,572	2.64E+06[c]	No
316-1_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.32	--[b]	--
316-1_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	13	--[d]	--
316-1_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
316-1_Overburden	Rad	Uranium-238	U-238	pCi/g	13	--[d]	--
316-1_Shallow_1	non-Rad	Aroclor-1248	12672-29-6	µg/kg	3,000	133	Yes
316-1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	19,014	11,726	Yes
316-1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	69	--[b]	--
316-1_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	98	1.50E+06	No
316-1_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	83,027	2.64E+06[c]	No
316-1_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	1.2	--[d]	--
316-1_Shallow_1	Rad	Uranium-238	U-238	pCi/g	28	--[d]	--
316-1_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	490	252,032	No
316-1_Shallow_3	non-Rad	Aroclor-1254	11097-69-1	µg/kg	98	--[b]	--
316-1_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	342	--[b]	--
316-1_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	50,455	--[b]	--
316-1_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	1.37E+06	3.40E+06	No
316-1_Shallow_3	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	3.2	--[b]	--
316-1_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	14,409	1.48E+06	No
316-1_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	1,105	8,451	No
316-1_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	94,656	--[b]	--
316-1_Shallow_3	non-Rad	Phenol	108-95-2	µg/kg	28	6.21E+06	No
316-1_Shallow_3	non-Rad	Selenium	7782-49-2	µg/kg	1,444	302,457	No

Table A-5. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
316-1_Shallow_3	non-Rad	Silver	7440-22-4	µg/kg	13,196	--[b]	--
316-1_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	63,074	2.64E+06[c]	No
316-1_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	82,016	6.41E+07	No
316-1_Shallow_3	Rad	Cobalt-60	10198-40-0	pCi/g	2.3	--[b]	--
316-1_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	23	--[d]	--
316-1_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	2.6	--[d]	--
316-1_Shallow_3	Rad	Uranium-238	U-238	pCi/g	21	--[d]	--
316-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	µg/kg	62	--[b]	--
316-1_Shallow_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	42,963	2.64E+06[c]	No
316-1_Shallow_4	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--
316-1_Shallow_4	Rad	Uranium-233/234	U-233/234	pCi/g	16	--[d]	--
316-1_Shallow_4	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
316-1_Shallow_4	Rad	Uranium-238	U-238	pCi/g	14	--[d]	--
316-2_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	210,452	2.64E+06[c]	No
316-2_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.092	--[b]	--
316-2_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	86	--[d]	--
316-2_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	12	--[d]	--
316-2_Shallow_1	Rad	Uranium-238	U-238	pCi/g	69	--[d]	--
316-2_Shallow_2	non-Rad	Aroclor-1248	12672-29-6	µg/kg	697	133	Yes
316-2_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	µg/kg	42	--[b]	--
316-2_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	110	--[b]	--
316-2_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	291,369	2.64E+06[c]	No
316-2_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.45	--[b]	--
316-2_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	115	--[d]	--
316-2_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	11	--[d]	--
316-2_Shallow_2	Rad	Uranium-238	U-238	pCi/g	96	--[d]	--
316-2_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	8,000	11,726	No
316-2_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	260	--[b]	--
316-2_Shallow_3	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	180	1.50E+06	No
316-2_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	73,174	2.64E+06[c]	No
316-2_Shallow_3	Rad	Uranium-235	15117-96-1	pCi/g	0.91	--[d]	--
316-2_Shallow_3	Rad	Uranium-238	U-238	pCi/g	24	--[d]	--
316-5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	38	--[b]	--
316-5_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	146	--[b]	--
316-5_Shallow_1	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	100	1.50E+06	No
316-5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	271,835	2.64E+06[c]	No
316-5_Shallow_1	Rad	Americium-241	14596-10-2	pCi/g	0.48	--[b]	--
316-5_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	2.3	--[b]	--
316-5_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	19	--[d]	--
316-5_Shallow_1	Rad	Uranium-238	U-238	pCi/g	89	--[d]	--
316-5_Shallow_2	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	140	210	No
316-5_Shallow_2	non-Rad	2-Butoxyethanol	111-76-2	µg/kg	240	2.58E+07	No
316-5_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	180	--[b]	--
316-5_Shallow_2	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	110	1.50E+06	No
316-5_Shallow_2	non-Rad	Chrysene	218-01-9	µg/kg	38	--[b]	--
316-5_Shallow_2	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	146	3.56E+07	No
316-5_Shallow_2	non-Rad	Silver	7440-22-4	µg/kg	3,600	--[b]	--
316-5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	204,701	2.64E+06[c]	No
316-5_Shallow_2	Rad	Americium-241	14596-10-2	pCi/g	0.12	--[b]	--
316-5_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	1.7	--[b]	--
316-5_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--
316-5_Shallow_2	Rad	Uranium-235	15117-96-1	pCi/g	9.0	--[d]	--
316-5_Shallow_2	Rad	Uranium-238	U-238	pCi/g	68	--[d]	--
316-5_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	57	133	No
316-5_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	70	--[b]	--
316-5_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	52	--[b]	--
316-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	190	--[b]	--
316-5_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	1,500	3.56E+07	No
316-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	138,095	2.64E+06[c]	No
316-5_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.8	--[b]	--
316-5_Shallow_Focused	Rad	Europium-155	14391-16-3	pCi/g	0.072	--[b]	--
316-5_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	7.7	--[d]	--
316-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	45	--[d]	--
331 LSLDF_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	25	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	590	2.28E+08	No
331 LSLDF_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	0.56	148	No
331 LSLDF_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	µg/kg	0.39	53	No
331 LSLDF_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	360	252,032	No
331 LSLDF_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	850	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	910	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	340	1.50E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Dieldrin	60-57-1	µg/kg	13	26	No
331 LSLDF_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	98	3.56E+07	No
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan I	959-98-8	µg/kg	1.9	1,433	No
331 LSLDF_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	µg/kg	3.1	1,433	No
331 LSLDF_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	110	8,451	No
331 LSLDF_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	µg/kg	3.3	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	11	1,931	No
331 LSLDF_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	590	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	9,500	3.03E+06	No
331 LSLDF_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,100	--[b]	--
331 LSLDF_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	137,000	6.41E+07	No
600-243_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	µg/kg	279	4.65E+06	No

Table A-5. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
600-243_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	31	--[b]	--
600-243_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	1,300	252,032	No
600-243_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	27	--[b]	--
600-243_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	18	--[b]	--
600-243_Shallow	non-Rad	Barium	7440-39-3	µg/kg	292,072	--[b]	--
600-243_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	43	--[b]	--
600-243_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	43	--[b]	--
600-243_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	46	--[b]	--
600-243_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	32	--[b]	--
600-243_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	2,079	--[b]	--
600-243_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	432	--[b]	--
600-243_Shallow	non-Rad	Boron	7440-42-8	µg/kg	294,463	--[e]	--
600-243_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	793	176,066	No
600-243_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	63	--[b]	--
600-243_Shallow	non-Rad	Copper	7440-50-8	µg/kg	53,981	3.40E+06	No
600-243_Shallow	non-Rad	Dibenzofuran	132-64-9	µg/kg	78	246,969	No
600-243_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	37	3.56E+07	No
600-243_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	79	2.82E+08	No
600-243_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	28	--[b]	--
600-243_Shallow	non-Rad	Lead	7439-92-1	µg/kg	40,139	1.48E+06	No
600-243_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	1,869	--[b]	--
600-243_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	204	6.97E+07	No
600-243_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	21,395	--[b]	--
600-243_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	70	--[b]	--
600-243_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	5,709	302,457	No
600-243_Shallow	non-Rad	Silver	7440-22-4	µg/kg	500	--[b]	--
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	95,319	--[e]	--
600-243_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	334,524	--[e]	--
600-243_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	84,099	6.41E+07	No
600-47_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,303	2.64E+06[c]	No
600-47_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.4	--[d]	--
600-47_Shallow	Rad	Uranium-238	U-238	pCi/g	1.6	--[d]	--
618-1_Deep	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,760	--[b]	--
618-1_Deep	non-Rad	Aroclor-1260	11096-82-5	µg/kg	294	--[b]	--
618-1_Deep	non-Rad	Barium	7440-39-3	µg/kg	299,000	--[b]	--
618-1_Deep	non-Rad	Copper	7440-50-8	µg/kg	46,300	3.40E+06	No
618-1_Deep	non-Rad	Lead	7439-92-1	µg/kg	58,400	1.48E+06	No
618-1_Deep	non-Rad	Mercury	7439-97-6	µg/kg	1,180	8,451	No
618-1_Deep	non-Rad	Molybdenum	7439-98-7	µg/kg	493	--[b]	--
618-1_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	220	3.03E+06	No
618-1_Deep	non-Rad	Uranium	7440-61-1	µg/kg	37,400	2.64E+06[c]	No
618-1_Deep	non-Rad	Zinc	7440-66-6	µg/kg	134,000	6.41E+07	No
618-1_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	33	--[d]	--
618-1_Deep	Rad	Uranium-235	15117-96-1	pCi/g	2.7	--[d]	--
618-1_Deep	Rad	Uranium-238	U-238	pCi/g	32	--[d]	--
618-1_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	407	252,032	No
618-1_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1.24E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	99	--[b]	--
618-1_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	1.87E+06	--[b]	--
618-1_Deep_Focused	non-Rad	Boron	7440-42-8	µg/kg	6,620	--[e]	--
618-1_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,030	176,066	No
618-1_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	18,900	--[b]	--
618-1_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	68,700	3.40E+06	No
618-1_Deep_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	3,300	--[b]	--
618-1_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	333,000	1.48E+06	No
618-1_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	8,940	8,451	Yes
618-1_Deep_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	2,140	--[b]	--
618-1_Deep_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,560	3.03E+06	No
618-1_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,290	--[b]	--
618-1_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	209,000	2.64E+06[c]	No
618-1_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	82,000	6.41E+07	No
618-1_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	6.5	--[b]	--
618-1_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	70	--[d]	--
618-1_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.5	--[d]	--
618-1_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	65	--[d]	--
618-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	264	--[b]	--
618-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	54	--[b]	--
618-1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	31	8,451	No
618-1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	300	3.03E+06	No
618-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,224	2.64E+06[c]	No
618-1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	--[d]	--
618-1_Shallow	Rad	Uranium-238	U-238	pCi/g	1.5	--[d]	--
618-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	1.22E+07	--[b]	--
618-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	455	252,032	No
618-1_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	35	133	No
618-1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	981	--[b]	--
618-1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	56	--[b]	--
618-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	19,500	--[b]	--
618-1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	23,800	3.40E+06	No
618-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	198	8,451	No
618-1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	260	3.03E+06	No
618-1_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	1,120	--[b]	--
618-1_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	7,080	2.64E+06[c]	No
618-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	68,100	6.41E+07	No

Table A-5. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-1_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-1_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.99	--[d]	--
618-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	8.2	--[d]	--
618-12_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	8,557	11,726	No
618-12_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	63	--[b]	--
618-12_Shallow	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	60	1.50E+06	No
618-12_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	32,092	2.64E+06[c]	No
618-12_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.47	--[d]	--
618-12_Shallow	Rad	Uranium-238	U-238	pCi/g	11	--[d]	--
618-13_Shallow	non-Rad	Acetone	67-64-1	µg/kg	8.6	2.28E+08	No
618-13_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	312	252,032	No
618-13_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	5.1	1,931	No
618-13_Shallow	non-Rad	Tin	7440-31-5	µg/kg	1,050	--[b]	--
618-13_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.9	--[d]	--
618-13_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
618-13_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	5.9	2.28E+08	No
618-13_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	233	252,032	No
618-13_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	150	6,000[f]	No
618-13_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	5.0	1,931	No
618-13_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	745	--[b]	--
618-13_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
618-2_Deep	non-Rad	Tin	7440-31-5	µg/kg	2,900	--[b]	--
618-2_Deep	non-Rad	Uranium	7440-61-1	µg/kg	501,000	2.64E+06[c]	No
618-2_Deep	Rad	Americium-241	14596-10-2	pCi/g	7.9	--[b]	--
618-2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	1.5	--[b]	--
618-2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	91	--[b]	--
618-2_Deep	Rad	Plutonium-241	14119-32-5	pCi/g	42	--[b]	--
618-2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	12	227,428	No
618-2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	161	--[d]	--
618-2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.78	--[d]	--
618-2_Deep	Rad	Uranium-238	U-238	pCi/g	165	--[d]	--
618-2_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	6.9	--[b]	--
618-2_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	27	--[b]	--
618-2_Deep_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	18	3.56E+07	No
618-2_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	1,200	302,457	No
618-2_Deep_Focused	non-Rad	Silver	7440-22-4	µg/kg	600	--[b]	--
618-2_Deep_Focused	non-Rad	Tin	7440-31-5	µg/kg	42,500	--[b]	--
618-2_Deep_Focused	non-Rad	Uranium	7440-61-1	µg/kg	148,000	2.64E+06[c]	No
618-2_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	9.2	--[b]	--
618-2_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.1	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-238	13981-16-3	pCi/g	1.6	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	92	--[b]	--
618-2_Deep_Focused	Rad	Plutonium-241	14119-32-5	pCi/g	33	--[b]	--
618-2_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	7.2	227,428	No
618-2_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	48	--[d]	--
618-2_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	2.4	--[d]	--
618-2_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	50	--[d]	--
618-2_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	1,000	302,457	No
618-2_Overburden	non-Rad	Tin	7440-31-5	µg/kg	2,700	--[b]	--
618-2_Shallow	non-Rad	Tin	7440-31-5	µg/kg	2,400	--[b]	--
618-2_Shallow	non-Rad	Uranium	7440-61-1	µg/kg	4,530	2.64E+06[c]	No
618-2_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.81	--[b]	--
618-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.2	--[b]	--
618-2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	7.7	--[b]	--
618-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	2.2	--[d]	--
618-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.21	--[d]	--
618-2_Shallow	Rad	Uranium-238	U-238	pCi/g	2.2	--[d]	--
618-2_Staging Pile	non-Rad	Uranium	7440-61-1	µg/kg	5,022	2.64E+06[c]	No
618-2_Staging Pile	Rad	Americium-241	14596-10-2	pCi/g	0.82	--[b]	--
618-2_Staging Pile	Rad	Plutonium-239/240	PU-239/240	pCi/g	10	--[b]	--
618-2_Staging Pile	Rad	Tritium	10028-17-8	pCi/g	2.3	9,176	No
618-2_Staging Pile	Rad	Uranium-233/234	U-233/234	pCi/g	2.0	--[d]	--
618-2_Staging Pile	Rad	Uranium-235	15117-96-1	pCi/g	0.12	--[d]	--
618-2_Staging Pile	Rad	Uranium-238	U-238	pCi/g	2.0	--[d]	--
618-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	238,577	2.64E+06[c]	No
618-3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	80	--[d]	--
618-3_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	4.8	--[d]	--
618-3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	79	--[d]	--
618-4_Deep	non-Rad	Lead	7439-92-1	µg/kg	20,000	1.48E+06	No
618-4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	64,506	2.64E+06[c]	No
618-4_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	20	--[d]	--
618-4_Deep	Rad	Uranium-235	15117-96-1	pCi/g	1.1	--[d]	--
618-4_Deep	Rad	Uranium-238	U-238	pCi/g	22	--[d]	--
618-4_Deep_Focused	non-Rad	2-Butanone	78-93-3	µg/kg	130	1.71E+08	No
618-4_Deep_Focused	non-Rad	Acetone	67-64-1	µg/kg	16	2.28E+08	No
618-4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	1,600	--[b]	--
618-4_Deep_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	4,700	--[b]	--
618-4_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,500	176,066	No
618-4_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	27,700	--[b]	--
618-4_Deep_Focused	non-Rad	Diethyl ether	60-29-7	µg/kg	1.0	3.98E+07	No
618-4_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	24,900	1.48E+06	No
618-4_Deep_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	40	1,931	No
618-4_Deep_Focused	non-Rad	Phenol	108-95-2	µg/kg	110	6.21E+06	No

Table A-5. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-4_Deep_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	24	1,316	No
618-4_Deep_Focused	non-Rad	Toluene	108-88-3	µg/kg	4.8	2.35E+06	No
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	34,000	--[e]	--
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - kerosene range	TPHKEROSENE	µg/kg	42,000	--[e]	--
618-4_Deep_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	65	--[e]	--
618-4_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	20,777	2.64E+06[c]	No
618-4_Deep_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	3,511	No
618-4_Deep_Focused	non-Rad	Trichloromonofluoromethane	75-69-4	µg/kg	12	2.90E+07	No
618-4_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	7.2	--[d]	--
618-4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.51	--[d]	--
618-4_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	6.9	--[d]	--
618-4_Overburden_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,197	2.64E+06[c]	No
618-4_Overburden_2	Rad	Uranium-233/234	U-233/234	pCi/g	1.3	--[d]	--
618-4_Overburden_2	Rad	Uranium-238	U-238	pCi/g	1.4	--[d]	--
618-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	49,000	1.48E+06	No
618-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	7,456	2.64E+06[c]	No
618-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	3.2	--[d]	--
618-4_Shallow	Rad	Uranium-238	U-238	pCi/g	3.1	--[d]	--
618-5_Deep	non-Rad	Lead	7439-92-1	µg/kg	82,300	1.48E+06	No
618-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	26,618	2.64E+06[c]	No
618-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	8.6	--[d]	--
618-5_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.46	--[d]	--
618-5_Deep	Rad	Uranium-238	U-238	pCi/g	8.9	--[d]	--
618-5_Deep_Focused	non-Rad	Antimony	7440-36-0	µg/kg	1,800	252,032	No
618-5_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	579,000	--[b]	--
618-5_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	33	8,451	No
618-5_Deep_Focused	non-Rad	Selenium	7782-49-2	µg/kg	2,270	302,457	No
618-5_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	36,540	2.64E+06[c]	No
618-5_Deep_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-5_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.48	--[d]	--
618-5_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	12	--[d]	--
618-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	9,773	2.64E+06[c]	No
618-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	4.1	--[d]	--
618-5_Overburden	Rad	Uranium-238	U-238	pCi/g	4.6	--[d]	--
618-5_Staging Pile_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,364	2.64E+06[c]	No
618-5_Staging Pile_4	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	--[d]	--
618-5_Staging Pile_4	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
618-5_Staging Pile_5	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,326	2.64E+06[c]	No
618-5_Staging Pile_5	Rad	Uranium-233/234	U-233/234	pCi/g	1.5	--[d]	--
618-5_Staging Pile_5	Rad	Uranium-235	15117-96-1	pCi/g	0.17	--[d]	--
618-5_Staging Pile_5	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
618-7_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	560	252,032	No
618-7_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	14,567	1.48E+06	No
618-7_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	44	8,451	No
618-7_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	20,977	--[b]	--
618-7_Shallow_1	non-Rad	Tin	7440-31-5	µg/kg	1,547	--[b]	--
618-7_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	10,814	2.64E+06[c]	No
618-7_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	3.6	--[d]	--
618-7_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	0.36	--[d]	--
618-7_Shallow_1	Rad	Uranium-238	U-238	pCi/g	3.6	--[d]	--
618-7_Shallow_2	non-Rad	Antimony	7440-36-0	µg/kg	660	252,032	No
618-7_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	20	8,451	No
618-7_Shallow_2	non-Rad	Tin	7440-31-5	µg/kg	1,500	--[b]	--
618-7_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	450	252,032	No
618-7_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	20	8,451	No
618-7_Shallow_3	non-Rad	Tin	7440-31-5	µg/kg	1,800	--[b]	--
618-7_Shallow_4	non-Rad	Antimony	7440-36-0	µg/kg	250	252,032	No
618-7_Shallow_4	non-Rad	Tin	7440-31-5	µg/kg	710	--[b]	--
618-7_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	150	4.94E+07	No
618-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	980	252,032	No
618-7_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	6.7	133	No
618-7_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	88	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	66	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	52	--[b]	--
618-7_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	11	--[b]	--
618-7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	470	--[b]	--
618-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	6,200	176,066	No
618-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	65,900	--[b]	--
618-7_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	69	--[b]	--
618-7_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	25,000	3.40E+06	No
618-7_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	45	--[b]	--
618-7_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	33	3.56E+07	No
618-7_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	48	2.82E+08	No
618-7_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	20	8,451	No
618-7_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	410	--[b]	--
618-7_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	1,200	--[b]	--
618-7_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	680,000	--[e]	--
618-7_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	19,563	2.64E+06[c]	No
618-7_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	11	--[d]	--
618-7_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.97	--[d]	--
618-7_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	6.4	--[d]	--
618-8_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	846	302,457	No
618-8_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.2	--[d]	--

Table A-5. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?
618-9_Shallow_Focused	non-Rad	1,1,2,2-Tetrachloroethane	79-34-5	µg/kg	110	210	No
618-9_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	680	2.28E+08	No
618-9_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	390	148	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1016	12674-11-2	µg/kg	1,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1221	11104-28-2	µg/kg	1,900	17	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1232	11141-16-5	µg/kg	1,900	17	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1242	53469-21-9	µg/kg	1,900	143	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,900	133	Yes
618-9_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3,900	--[b]	--
618-9_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	11,600	11,726	No
618-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	5,200	--[b]	--
618-9_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	2,700	1.50E+06	No
618-9_Shallow_Focused	non-Rad	Chlordane	57-74-9	µg/kg	69	--[b]	--
618-9_Shallow_Focused	non-Rad	Chloroform	67-66-3	µg/kg	9.0	5,207	No
618-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	7,200	3.56E+07	No
618-9_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	44	--[b]	--
618-9_Shallow_Focused	non-Rad	Hexachlorobutadiene	87-68-3	µg/kg	760	--[b]	--
618-9_Shallow_Focused	non-Rad	Hexachloroethane	67-72-1	µg/kg	17,000	29,166	No
618-9_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	330	8,451	No
618-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	2,300	1,931	Yes
618-9_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	1.67E+06	1.36E+07	No
618-9_Shallow_Focused	non-Rad	Tetrachloroethene	127-18-4	µg/kg	920	1,316	No
618-9_Shallow_Focused	non-Rad	Toluene	108-88-3	µg/kg	9.0	2.35E+06	No
618-9_Shallow_Focused	non-Rad	Trichloroethene	79-01-6	µg/kg	2.0	3,511	No
618-9_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	3.0	--[d]	--
628-4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	61	--[b]	--
628-4_Shallow	non-Rad	Aroclor-1242	53469-21-9	µg/kg	42	143	No
628-4_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,115	133	Yes
628-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	243	--[b]	--
628-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	38	--[b]	--
628-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	99,167	1.48E+06	No
628-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
628-4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.11	--[d]	--
UPR-300-17_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	117	4.94E+07	No
UPR-300-17_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	7.0	--[b]	--
UPR-300-17_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	359	252,032	No
UPR-300-17_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	1,970	133	Yes
UPR-300-17_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	450	--[b]	--
UPR-300-17_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	113	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	59	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	44	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	33	--[b]	--
UPR-300-17_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	9.9	--[b]	--
UPR-300-17_Shallow	non-Rad	Boron	7440-42-8	µg/kg	3,903	--[e]	--
UPR-300-17_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	39	--[b]	--
UPR-300-17_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	35	2.82E+08	No
UPR-300-17_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.9	1.06E+08	No
UPR-300-17_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	5.9	--[b]	--
UPR-300-17_Shallow	non-Rad	Lead	7439-92-1	µg/kg	11,240	1.48E+06	No
UPR-300-17_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	69	8,451	No
UPR-300-17_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	48	6.97E+07	No
UPR-300-17_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	563,654	--[b]	--
UPR-300-17_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	34	--[b]	--
UPR-300-17_Shallow	non-Rad	Silver	7440-22-4	µg/kg	340	--[b]	--
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,950	--[e]	--
UPR-300-17_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	210,420	--[e]	--
UPR-300-17_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	12,420	2.64E+06[c]	No
UPR-300-17_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	157,172	6.41E+07	No
UPR-300-17_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	6.1	--[d]	--
UPR-300-17_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.91	--[d]	--
UPR-300-17_Shallow	Rad	Uranium-238	U-238	pCi/g	4.0	--[d]	--
UPR-300-46_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	13	4.94E+07	No
UPR-300-46_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	381	252,032	No
UPR-300-46_Shallow	non-Rad	Aroclor-1248	12672-29-6	µg/kg	879	133	Yes
UPR-300-46_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	490	--[b]	--
UPR-300-46_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	84	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	3.9	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	5.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.8	--[b]	--
UPR-300-46_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	5.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	1.3	--[b]	--
UPR-300-46_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	9.6	2.82E+08	No
UPR-300-46_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.2	1.06E+08	No
UPR-300-46_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	7.6	--[b]	--
UPR-300-46_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	29	8,451	No
UPR-300-46_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	36	6.97E+07	No
UPR-300-46_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	4.4	--[b]	--
UPR-300-46_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	4,897	2.64E+06[c]	No
UPR-300-46_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.8	--[d]	--
UPR-300-46_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.24	--[d]	--
UPR-300-46_Shallow	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--

Notes:

a. ECF-300FF5-11-0153, A 70:30 source distribtuion is used for analytes with Kd≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g.

Table A-5. Comparison of EPCs from 300 Area Source OU Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection[a]	Is EPC > Soil Screening Level Protective of Surface Water?

b. The calculated soil screening level for the analyte is considered non-representative because: (1) breakthrough is simulated within 1,000 years for some soil columns while other soil columns (a majority) show no breakthrough (breakthrough defined as concentrations below 1E-04 µg/L or activity below 1E-04 pCi/L), and/or (2) the calculated residual mass of contaminant in the pore volume is high enough to represent a substantial (and physically improbable) reduction in porosity.

c. Due to the complex geochemistry of uranium in 300 Area source operable unit soils, uranium SSLs were derived using a site-speicific two-dimensional model as described in ECF-300FF5-11-0151.

d. Uranium isotopes are accounted for by converting from activity-based (pCi/g) to mass-based (µg/kg) concentrations and then summing to provide a mass-based total uranium exposure point concentration (identified as Total_U_Isotopes), as described in ECF-300NPL-11-0137, Computation of Exposure Point Concentrations for the 300-FF-2 Source Operable Unit.

e. A soil screening level is not calculated because a surface water cleanup level or surface water standard is not available for the analyte.

f. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

-- = Not applicable or no value

ECF-300FF5-12-0043
Revision 0

Radon Flux Calculation for the 300 Area

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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**Approved for Public Release;
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Radon Flux Calculation for the 300 Area

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Assistant Secretary for Environmental Management

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CH2MHILL Plateau Remediation Company

Environmental Calculation Cover Page

Part 1: Completed by the Responsible Manager

Project: 300 Area Remedial Investigation/Feasibility Study

Date: 17 May 2012

Calculation Title & Description: Radon Flux Calculation for the 300 Area

Preparer: S Mehta	**Basis of Qualification:** Education & experience
Checker: WE Nichols	**Basis of Qualification:** Education & experience
Senior Reviewer: LL Lehman	**Basis of Qualification:** Education & experience

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21 MAY 2012

DATE

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DATE

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5/21/12

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6 Results/Conclusions **3**

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Attachment

A. Software Installation and Checkout Form: GoldSim® Pro **7**

Terms

CHPRC	CH2M HILL Plateau Remediation Company
SIM	Soil Inventory Model
STOMP	Subsurface Flow and Transport Over Multiple Phases (software)

1 Purpose

This environmental calculation is performed to estimate the amount of radon generated from the radioactive decay of residual uranium contamination in the 300 Area of the Hanford Site. In this calculation, the residual uranium concentration in the soil column is selected to be equal to the preliminary remediation goal (PRG) value of 157 µg/g calculated in ECF-300FF5-11-0151 Rev. 2, *Groundwater Flow and Uranium Transport Modeling in Support of the 300 Area FF-5 RI/FS Document*, that is deemed protective of groundwater for the industrial recharge scenario defined in that calculation.

2 Methodology

A one-dimensional diffusive transport of radon-222 through the residual uranium contaminated unsaturated zone is simulated to determine the outward flux of radon-222 at the land surface (and into the air). Transport calculations are performed in the unsaturated porous media, where the contaminant mass can be present among three phases (media): solid, water, and air. The mass is partitioned among these three phases based on partitioning coefficients (including K_d and Henry's constant). The transport calculations are performed using the GoldSim® Pro software, in which a diffusive mass flux link is used to transport mass through a slowly moving fluid via the process of molecular diffusion. Diffusive mass transport is driven by (and proportional to) a concentration difference, with mass diffusing from high concentration to low concentration. The constant of proportionality is referred to as the diffusive conductance:

Diffusive Mass Rate = (Diffusive Conductance) × (Concentration Difference)

The diffusive conductance is a function of the properties of the species and fluids involved, and the geometry of the diffusive process (GoldSim Technology Group, 2009).

The calculations are performed over contaminated soil column of length 11 m, which is approximately the thickness of vadose zone in the 300 Area. The contaminated zone is assumed to be covered by 5 m of clean material (such as backfill), which is typical over remediated waste sites, and interfaces with the air column above. For the purpose of calculations, the model domain length in the other two coordinate directions is set at 1 m each thereby setting the area for diffusive flux calculation to be 1 m^2.

The contaminated zone is assumed to be uniformly contaminated at 157 µg/g soil uranium concentration. From this the total uranium mass in a bulk volume is first calculated and then partitioned among uranium isotopes based on their relative abundances (U-238: 0.993; U-236: 0.00014; U-235: 0.0068; U-234: 0.000059; U-233: 0.0026). These relative fractions are based on evaluation of inventory at 316-5 waste site in the revised estimate from Soil Inventory Model (SIM) (ECF-Hanford-11-0140 Rev.0, *Corrective Analysis of Hanford Soil Inventory Model (SIM, 2005) Results for 300 Area Waste Sites*). Because of fuel fabrication activities undertaken at 300 Area, the daughter products formed from radioactive decay of U-238 and U-234 are not expected to be present in secular equilibrium and thus should have negligibly small concentrations for times within the limits of this calculation. This is indeed the case based on analysis of waste streams and the observed pre-remediation soil concentrations in the many boreholes at or near the waste sites as discussed in BHI-01164, *300 Area Process Trenches Verification Package*; WHC-SP-0193, *300 Area Process Trench Sediment Analysis Report*; and DOE/RL-92-43 Rev. 0, *Phase I Remedial Investigation Report for the 300-FF-1 Operable Unit*.

To maximize the diffusive transport in the air pathway, no advection is considered in the model. The diffusive porosity and water saturation values used in the model are consistent with the STOMP

(Subsurface Flow and Transport Over Multiple Phases; PNNL-15782, *STOMP Subsurface Transport Over Multiple Phases Version 4.0 User's Guide*) model used for uranium transport calculations in the 300 Area (ECF-300FF5-11-0151 Rev. 2).

3 Assumptions and Inputs

The transport properties used for this calculation are summarized in Table 1.

Table 1. Transport Parameters Used in Radon Flux Calculation

Parameter	Value	Comment
Diffusive Porosity	0.17	Similar values for Hanford formation and Ringold Formation
Water Content	0.05	Approximate residual water content (provides maximum diffusive pathway through air)
Air phase tortuosity in porous medium	0.017	Based on Millington and Quirk (1960) model: $\tau = \frac{\theta_a^2}{\varphi^{2/3}} = \frac{(\phi - \theta_w)^2}{\varphi^{2/3}}$ Where: τ is the tortuosity, θ_a, the air content of the porous medium, θ_w, the water content of the porous medium, ϕ, the Diffusive porosity. φ, fitted total porosity value, equal to 0.8 (Liu *et al.*, 2006).
Diffusion coefficient in Air for Rn-222	0.11 cm^2/s	Nazaroff and Nero (1988) as cited in ANL/EAD-4.
Uranium K_d (solid/water phase partitioning)	2.0 mL/g	Based on gravel corrected K_d value using the pore water alkalinity of 3.2 meq/L. The equation relating uranium K_d to alkalinity is presented in ECF-300FF5-11-0151 Rev 2.
Dimensionless Henry's constant for Rn-222 (air/water phase partitioning)	4.47	Derived from Sander (1999) at 1 atm pressure and 20°C.

4 Software Applications

Software used for this calculation was used in accordance with PRC-PRO-IRM-309, *Controlled Software Management*.

4.1 Approved Software

The GoldSim®[1] Pro software package was used to perform this calculation. This software is qualified for controlled use by the CH2M HILL Plateau Remediation Company under the following software quality assurance documentation: CHPRC-00180, *GoldSim Pro Functional Requirements Document*; CHPRC-00175, *GoldSim Pro Software Management Plan*; CHPRC-00224, *GoldSim Pro Software Test Plan*; CHPRC-00262, *GoldSim Pro Acceptance Test Report*; and CHPRC-00256, *GoldSim Pro Requirements Traceability Matrix.*

4.1.1 Description

Required descriptive information for the software used in this calculation:

- Software Title: GoldSim® Pro
- Software Version: 10.11
- HISI Identification Number: 2461
- Workstation type and property number (from which software is run): SUNIL-PC

4.1.2 Software Installation and Checkout

A copy of the Software Installation and Checkout form for the workstation used for this calculation is provided in Attachment A.

4.1.3 Statement of Valid Software Application

The application of GoldSim® Pro to this calculation is a valid use of this simulation software, and has been applied within the limitations of this software as identified in CHPRC-00180.

5 Calculation

Transport is calculated using the GoldSim® Pro simulation software for a period of 2000 years (twice the customary time frame for such evaluations to show continuing trend) to estimate the radon-222 flux from the contaminated soil column through the clean cover into the atmosphere. Because of greater partitioning of radon-222 to the air phase (from the water phase) the predominant transport medium is air.

The model files are archived to the Environmental Modeling Management Archive (EMMA) as required by the CH2M HILL Plateau Remediation Company (CHPRC) *Quality Assurance Project Plan for Modeling* (Appendix G in CHPRC-00189 Rev. 6, *CH2M HILL Plateau Remediation Company Environmental Quality Assurance Program Plan*).

6 Results/Conclusions

The results obtained from this calculation using GoldSim® Pro software are presented in Figure 1 in units of pCi/sec per meter square area. The flux continues to increase with time as the decay of U-238 and U-234 occurs. The maximum value is calculated to be about 0.005 pCi/sec/m^2. As a point of comparison, this maximum is much smaller than the regulatory 1000-year radon flux compliance limit of 20

[1] GoldSim® Pro is a registered trademark of GoldSim Technologies, Issaquah, Washington, in the United States and other countries.

pCi/sec/m^2 prescribed in the DOE O 435.1, *Radioactive Waste Management*, for disposal of low-level waste in the disposal facilities (this calculation does not pertain to a radioactive waste disposal facility, and this comparison is noted strictly for comparative purposes).

Because of such small flux of radon-222 calculated for the 300 Area it is unlikely to pose any risk to the members of the public.

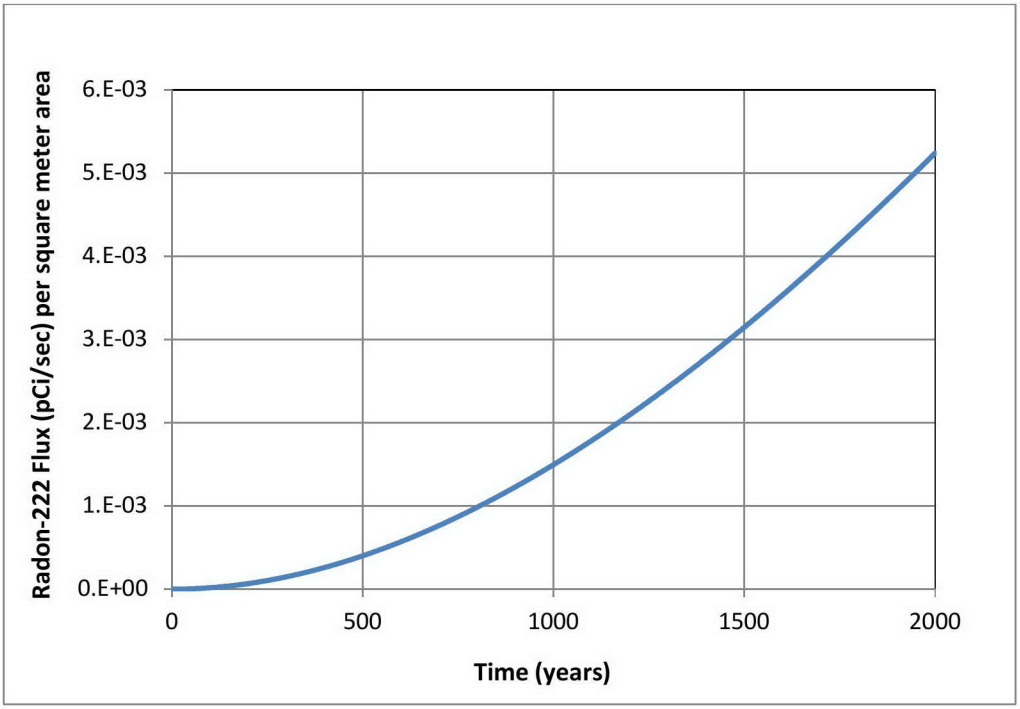

Figure 1. Calculated Radon-222 Flux

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Attachment A

Software Installation and Checkout Form: GoldSim® Pro

CHPRC SOFTWARE INSTALLATION AND CHECKOUT FORM

Software Owner Instructions:
Complete Fields 1-13, then run test cases in Field 14. Compare test case results listed in Field 15 to corresponding Test Report outputs. If results are the same, sign and date Field 19. If not, resolve differences and repeat above steps.

Software Subject Matter Expert Instructions:
Assign test personnel. Approve the installation of the code by signing and dating Field 21, then maintain form as part of the software support documentation.

GENERAL INFORMATION:

1. Software Name: GoldSim Pro 10.00(SP2) Software Version No.: 10.00

EXECUTABLE INFORMATION:

2. Executable Name (include path):

   C:\Program Files\GTC\GoldSim 10\GoldSim.exe

3. Executable Size (bytes): 1,441,000

COMPILATION INFORMATION:

4. Hardware System (i.e., property number or ID):

   Compiled by vendor

5. Operating System (include version number):

   Windows

INSTALLATION AND CHECKOUT INFORMATION:

6. Hardware System (i.e., property number or ID):

   SUNIL-PC (INTERA Property Tag 00362)

7. Operating System (include version number):

   Windows Vista Business SP1

8. Open Problem Report? (•) No ( ) Yes PR/CR No.

TEST CASE INFORMATION:

9. Directory/Path:

   C:\Program Files\GTC\GoldSim 10\General Examples

10. Procedure(s):

    per CHPRC-00224 Rev 0, GoldSim Pro Software Test Plan

11. Libraries:

    N/A

12. Input Files:

    FirstModel.gsm

13. Output Files:

    FirstModel.gsm

14. Test Cases:

    GS-ITC-1

15. Test Case Results:

    Match expected results as presented in CHPRC-00224 Rev 0, GoldSim Pro Software Test Plan

16. Test Performed By: Sunil Mehta

17. Test Results: (•) Satisfactory, Accepted for Use ( ) Unsatisfactory

18. Disposition (include HISI update):

    Platform listing added to HISI entry

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CHPRC SOFTWARE INSTALLATION AND CHECKOUT FORM (continued)

1. Software Name: GoldSim Pro 10.00(SP2) Software Version No.: 10.00

Prepared By:

19.	Software Owner (Signature)	W.E. Nichols (Print)	7/8/2009 (Date)

20. Test Personnel:

Sign	S. Mehta (Print)	7/8/09 (Date)
Sign	Print	Date
Sign	Print	Date

Approved By:

21.	Software SME (Signature)	C.W. Connell (Print)	10/14/09 (Date)

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