Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

14-AMRP-0292

SEP 19 2014

Ms. J. A. Hedges, Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
3100 Port of Benton Blvd.
Richland, Washington 99354

Dear Ms. Hedges:

TRANSMITTAL OF APPROVED WASTE SITE RECLASSIFICATION FORM AND SUPPORTING DOCUMENTATION FOR THE 100-N-93, 100-N STAIN AREA #2 WASTE SITE, REVISION 0

Attached for your use is the approved Waste Site Reclassification Form No. 2014-090 and supporting, "Remaining Sites Verification Package for the 100-N-93, 100-N Stain Area #2 Waste Site," Rev. 0. If you have questions, please contact me or your staff may contact Joanne Chance, of my staff, at (509) 376-0811.

Sincerely,

Mark S. French, Director
River Corridor Division

AMRP:JCC

Attachment

cc w/attach:
N. M. Menard, Ecology
Administrative Record, H6-08

cc w/o attach:
R. D. Cantwell, WCH
S. L. Feaster, WCH
D. L. Plung, WCH
J. P. Shearer, CHPRC

WASTE SITE RECLASSIFICATION FORM

Operable Unit: 100-NR-1 **Control No.:** 2014-090

Waste Site Code(s)/Subsite Code(s): 100-N-93

Reclassification Category: Interim ☒ Final ☐

Reclassification Status: Closed Out ☒ No Action ☐ Rejected ☐
RCRA Post closure ☐ Consolidated ☐ None ☐

Approvals Needed: DOE ☒ Ecology ☒ EPA ☐

Description of current waste site condition:

The 100-N-93, 100-N Stain Area #2 waste site, part of the 100-NR-1 Operable Unit, was added to the *Interim Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington* (100-N Area ROD), U.S. Environmental Protection Agency, Region 10, Seattle, Washington (EPA 1999), as a candidate site for confirmatory sampling via the *Explanation of Significant Differences for the 100-NR-1 and 100-NR-2 Operable Units Interim Remedial Action Record of Decision, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington (EPA 2011). Subsequently, the 100-N-93 waste site was recommended for remedial action.

The 100-N-93 waste site was a large dumping area where construction and demolition waste was buried, consisting of stained soil, concrete, metal, glass, miscellaneous debris, suspected friable asbestos, garnet sand, and areas with stressed or no vegetation. The debris consisted of lead-acid batteries, miscellaneous steel, burnt wood, empty steel drums, wire, and communications cable.

Remedial action at the 100-N-93 waste site was performed between March 26, 2013, and March 21, 2014. The depth of the remediation ranged from 4.6 to 6.1 m (15 to 20 ft) below ground surface. An estimated 35,551 bank cubic meters (46,499 bank cubic yards) of soil and debris was removed and disposed at the Environmental Restoration Disposal Facility (ERDF).

Cleanup verification sampling was conducted on May 15, 2014, to determine if the waste site met the remedial action objectives (RAOs) and remedial action goals (RAGs) established by the *Remedial Design Report/Remedial Action Work Plan for the 100-N Area* (100-N Area RDR/RAWP), DOE/RL-2005-93, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington (DOE-RL 2013), and the 100-N Area ROD (EPA 1999). The selected remedy involved (1) excavating the site to the extent required to meet specified soil cleanup levels, (2) disposing of contaminated excavation materials at ERDF, (3) demonstrating through verification sampling that cleanup goals have been achieved, and (4) proposing the site for reclassification to Interim Closed Out.

Basis for reclassification:

The verification sampling and modeling results for the 100-N-93 waste site demonstrate that the site meets the RAOs and corresponding RAGs established in the 100-N Area RDR/RAWP (DOE-RL 2013) and the 100-N Area ROD (EPA 1999) to support a reclassification to Interim Closed Out. These sampling and modeling results established that residual contaminant concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils (i.e., surface to 4.6 m [15 ft] deep). The results also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River. Contamination above direct exposure levels was not observed in shallow zone or deep zone soils; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone soil are not required. The basis for reclassification is described in detail in the *Remaining Sites Verification Package for the 100-N-93, 100-N Stain Area #2 Waste Site* (attached).

Because the 100-N-93 waste site was located within the 100-N Area Borrow Pit, the soil surrounding and underlying the remediated waste site will be used as backfill material at other 100-N Area waste sites. Residual contamination below the remediated waste site meets the groundwater/river cleanup criteria and does not preclude the use of the underlying and surrounding soil as backfill providing the fill material is placed more than 1 m (3.3 ft) above the groundwater table.

Because the remediated 100-N-93 waste site was located within the 100-N Borrow Pit, the waste site will not be backfilled and revegetated as outlined in the 100-N Area RDR/RAWP (DOE-RL 2013). Recontouring and revegetation of the 100-N-93 waste site will occur as part of the 100-N Borrow Pit closure in accordance with the *Expansion of Borrow Areas on the Hanford Site – Mitigation Action Plan for DOE/EA-1934*, WCH-561, Rev. 0 (WCH 2013).

WASTE SITE RECLASSIFICATION FORM

Operable Unit: 100-NR-1 **Control No.:** 2014-090

Waste Site Code(s)/Subsite Code(s): 100-N-93

Regulator comments:

Waste Site Controls:

Engineered Controls: ☐ Yes ☒ No Institutional Controls: ☐ Yes ☒ No O&M Requirements: ☐ Yes ☒ No

If any of the Waste Site Controls are checked Yes, specify control requirements including reference to the Record of Decision, TSD Closure Letter, or other relevant documents:

J. P. Neath DOE Federal Project Director (printed)	J P Neath Signature	9/4/14 Date
N. Menard Ecology Project Manager (printed)	Nina M. Menard Signature	9/9/14 Date
N/A EPA Project Manager (printed)	Signature	Date

REMAINING SITES VERIFICATION PACKAGE FOR THE 100-N-93, 100-N STAIN AREA #2 WASTE SITE

Attachment to Waste Site Reclassification Form 2014-090

September 2014

REMAINING SITES VERIFICATION PACKAGE FOR THE 100-N-93, 100-N STAIN AREA #2 WASTE SITE

EXECUTIVE SUMMARY

The 100-N-93, 100-N Stain Area #2 waste site, part of the 100-NR-1 Operable Unit, is located approximately 1,131 m (3,711 ft) southwest of the 105-N Reactor Building. The 100-N-93 waste site consisted of potentially contaminated soil, concrete, metal, glass, miscellaneous debris, stained soil, friable asbestos, and garnet sand. The 100-N-93 waste site, classified as an inactive dumping area, was located within the much larger 100-N-19 waste site. The 100-N-19 waste site was used for disposal of nonhazardous debris from 100-N and the Hanford Generating Plant (HGP). The HGP is geographically located within the 100-NR-1 boundary, although it is not part of the 100-NR-1 source operable unit. The entire 100-N-19 waste site has been disturbed through past use as a borrow pit and by dumping of miscellaneous construction and demolition debris (WCH 2011a). The 100-N-19 waste site was reclassified as "Rejected" in the Waste Information Data System in July 2004 (BHI 2004). The 100-N-93 waste site was identified for remediation based on field observations and the confirmatory sampling results (WCH 2011a).

Remedial action at the 100-N-93 waste site was performed between March 26, 2013, and March 21, 2014. The depth of the remediation ranged from 4.6 to 6.1 m (15 to 20 ft) below ground surface resulting in approximately 35,551 bank cubic meters (46,499 bank cubic yards) of soil and debris removed for disposal at the Environmental Restoration Disposal Facility (ERDF). The debris consisted of lead-acid batteries, asbestos, miscellaneous steel, burnt wood, glass, concrete, empty steel drums, wire, garnet sand, and communications cable. All waste material was loaded directly from the waste site into the ERDF disposal containers; therefore, no waste staging pile area was created. Additionally, there is no overburden soil stockpile associated with the waste site. No anomalous materials were encountered during the remediation.

Verification soil sampling was conducted on May 15, 2014. A summary of the cleanup evaluation for the soil sampling results against the applicable remedial action goals (RAGs) is presented in Table ES-1. The results of the verification sampling were used to make reclassification decisions for the 100-N-93 waste site in accordance with the TPA-MP-14 procedure in the *Tri-Party Agreement Handbook Management Procedures* (DOE-RL 2011).

Table ES-1. Summary of Remedial Action Goals for the 100-N-93 Waste Site. (2 Pages)

Regulatory Requirement	Remedial Action Goals	Results	Remedial Action Objectives Attained?
Direct Exposure – Radionuclides	Attain a dose rate of <15 mrem/yr above background over 1,000 years.	Radionuclides were not COPCs for the 100-N-93 waste site.	NA
Direct Exposure – Nonradionuclides	Attain individual COPC direct exposure RAGs.	All individual COPC concentrations are below the direct exposure RAGs.	Yes

Table ES-1. Summary of Remedial Action Goals for the 100-N-93 Waste Site. (2 Pages)

Regulatory Requirement	Remedial Action Goals	Results	Remedial Action Objectives Attained?
Risk Requirements – Nonradionuclides	Attain a hazard quotient of <1 for all individual noncarcinogens.	The hazard quotients for individual nonradionuclide COPCs are <1.	Yes
	Attain a cumulative hazard quotient of <1 for noncarcinogens.	The cumulative hazard quotient for the 100-N-93 waste site (2.2×10^{-3}) is <1.	
	Attain an excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens.	The excess cancer risk for individual carcinogens is $<1 \times 10^{-6}$.	
	Attain a cumulative excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.	The cumulative excess cancer risk for the 100-N-93 waste site (1.7×10^{-7}) is $<1 \times 10^{-5}$.	
Groundwater/River Protection – Radionuclides	Attain single COPC groundwater and river RAGs.	Radionuclides were not COPCs for the 100-N-93 waste site.	Yes
	Attain National Primary Drinking Water Regulations [a]: 4 mrem/yr (beta/gamma) dose standard to target receptor/organ.		
	Meet drinking water standards for alpha emitters: the more stringent of 15 pCi/L MCL or 1/25th of the derived concentration guide for DOE Order 5400.5 [b].		
	Meet total uranium standard of 30 µg/L (21.2 pCi/L) [c].		
Groundwater/River Protection – Nonradionuclides	Attain individual nonradionuclide groundwater and Columbia River cleanup requirements.	Benzo(a)anthracene and benzo(a)pyrene exceeded soil RAGs for groundwater and/or river protection. However, based on RESRAD modeling discussed in Appendix C of the 100-N Area RDR/RAWP (DOE-RL 2013), it is predicted that the residual concentrations of these contaminants will not reach groundwater (and thus the Columbia River) within 1,000 years [d].	Yes

[a] "National Primary Drinking Water Regulations" (40 *Code of Federal Regulations* 141).

[b] *Radiation Protection of the Public and Environment* (DOE Order 5400.5).

[c] Based on the isotopic distribution of uranium in the 100 Area, the 30 µg/L MCL corresponds to 21.2 pCi/L. Concentration-to-activity calculations are documented in *Calculation of Total Uranium Activity Corresponding to a Maximum Contaminant Level for Total Uranium of 30 Micrograms per Liter in Groundwater* (BHI 2001).

[d] Based on RESRAD modeling discussed in Appendix C of the 100-N Area RDR/RAWP (DOE-RL 2013), residual concentrations of benzo(a)anthracene and benzo(a)pyrene, are not predicted to migrate vertically in 1,000 years (based on the lowest soil-partitioning coefficient of the contaminants [benzo(a)pyrene] of 360 mL/g). A contaminant with a soil-partitioning coefficient of 80 mL/g or greater is not predicted to migrate vertically through the soil. Therefore, the residual concentrations of benzo(a)anthracene and benzo(a)pyrene are predicted to be protective of groundwater and the Columbia River.

COPC = contaminant of potential concern
MCL = maximum contaminant level
NA = not applicable
RAG = remedial action goal
RDR/RAWP = Remedial Design Report/Remedial Action Work Plan
RESRAD = RESidual RADioactivity (dose model)

In accordance with this evaluation, the verification sampling results and modeling support a reclassification of this site to Interim Closed Out. The current site conditions achieve the remedial action objectives and the corresponding RAGs established in the *Remedial Design Report/Remedial Action Work Plan for the 100-N Area* (DOE-RL 2013) and the *Interim Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington* (100-N Area ROD) (EPA 1999). These results show that residual soil concentrations support future land uses that can be represented (or bounded) by a rural-residential scenario. The sampling and modeling results also demonstrate that residual contaminant concentrations support unrestricted future use of shallow zone soil (i.e., surface to 4.6 m [15 ft] deep), and contaminant levels remaining in the soil are protective of groundwater and the Columbia River. Excavation depths include both shallow zone and deep zone components that are considered as one decision unit and are interim closed out using the more restrictive of the shallow zone direct exposure and groundwater/river protection criteria. Contamination above direct exposure levels was not observed in shallow or deep zone soils; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone soil are not required.

The 100-N-93 waste site was located within the 100-N Area Borrow Pit and the soil surrounding and underlying the remediated waste site will be used as backfill material at other 100-N Area waste sites. Residual contamination below the remediated waste site meets the groundwater/river cleanup criteria and does not preclude the use of the underlying and surrounding soil as backfill providing the fill material is placed more than 1 m (3.3 ft) above the groundwater table.

Because the remediated 100-N-93 waste site was located within the 100-N Borrow Pit, the waste site will not be backfilled and revegetated as outlined in the 100-N Area RDR/RAWP (DOE-RL 2013). Recontouring and revegetation of the 100-N-93 waste site will occur as part of the 100-N Borrow Pit closure in accordance with the *Expansion of Borrow Areas on the Hanford Site – Mitigation Action Plan for DOE/EA-1934* (WCH 2013).

Soil cleanup levels were established in the 100-N Area ROD (EPA 1999) based in part on a limited ecological risk assessment. Although not required by the 100-N Area ROD, a comparison against ecological risk screening levels has been made for the 100-N-93 waste site contaminants of potential concern and other constituents (Appendix A). Ecological screening levels from the *Washington Administrative Code* 173-340 were exceeded for vanadium. The U.S. Environmental Protection Agency ecological soil screening levels were exceeded for manganese and vanadium. Exceedance of screening values is intended to trigger additional evaluation and does not necessarily indicate the existence of risk to ecological receptors. Because the concentrations of manganese and vanadium are below the Hanford Site background value, it is believed that the presence of these constituents do not pose a risk to ecological receptors. All exceedances will be evaluated in the context of additional lines of evidence for risk to ecological receptors as part of the final closeout decision for this site.

REMAINING SITES VERIFICATION PACKAGE FOR THE 100-N-93, 100-N STAIN AREA #2 WASTE SITE

STATEMENT OF PROTECTIVENESS

The 100-N-93, 100-N Stain Area #2 waste site cleanup verification sampling data, site evaluations, and supporting documentation demonstrate that the site meets the objectives established in the *Remedial Design Report/Remedial Action Work Plan for the 100-N Area* (100-N Area RDR/RAWP) (DOE-RL 2013) and the *Interim Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington* (100-N Area ROD) (EPA 1999). The results of verification sampling and modeling show that residual soil concentrations do not preclude any future uses (as bounded by the rural-residential scenario) and allow for unrestricted use of shallow zone soils (i.e., surface to 4.6 m [15 ft] deep). The results also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River. Excavation depths include both shallow zone and deep zone components that are considered as one decision unit and are interim closed out using the more restrictive of the shallow zone direct exposure and groundwater/river protection criteria. Contamination above direct exposure levels was not observed in shallow or deep zone soils; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone soil are not required.

The 100-N-93 waste site was located within the 100-N Area Borrow Pit and the soil surrounding and underlying the remediated waste site will be used as backfill material at other 100-N Area waste sites. Residual contamination below the remediated waste site meets the groundwater/river cleanup criteria and does not preclude the use of the underlying and surrounding soil as backfill providing the fill material is placed more than 1 m (3.3 ft) above the groundwater table.

Because the remediated 100-N-93 waste site was located within the 100-N Borrow Pit, the waste site will not be backfilled and revegetated as outlined in the 100-N Area RDR/RAWP (DOE-RL 2013). Recontouring and revegetation of the 100-N-93 waste site will occur as part of the 100-N Borrow Pit closure in accordance with the *Expansion of Borrow Areas on the Hanford Site – Mitigation Action Plan for DOE/EA-1934* (WCH 2013).

Soil cleanup levels were established in the 100-N Area ROD (EPA 1999) based in part on a limited ecological risk assessment. Although not required by the 100-N Area ROD, a comparison against ecological risk screening levels has been made for the 100-N-93 waste site contaminants of potential concern (COPCs) and other constituents (Appendix A). Ecological screening levels from the *Washington Administrative Code* (WAC) 173-340 were exceeded for vanadium. The U.S. Environmental Protection Agency (EPA) ecological soil screening levels were exceeded for manganese and vanadium. Exceedance of screening values is intended to trigger additional evaluation and does not necessarily indicate the existence of risk to ecological receptors. Because the concentrations of manganese and vanadium are below the Hanford Site background value, it is believed that the presence of these constituents do not pose a risk to ecological receptors. All exceedances will be evaluated in the context of additional lines of evidence for risk to ecological receptors as part of the final closeout decision for this site.

GENERAL SITE INFORMATION AND BACKGROUND

The 100-N-93, 100-N Stain Area #2 waste site is located within the 100-NR-1 Operable Unit, approximately 1,131 m (3,711 ft) southwest of the 105-N Reactor Building (Figure 1). The 100-N-93 waste site was identified during the 100-N Area orphan sites evaluation conducted in April 2008 and was described as a dumping area located within the 100-N-19 waste site (WCH 2011a). The 100-N-93 waste site contained concrete, metal, and glass debris. Stained soil, suspected friable asbestos, garnet sand, and areas of stressed vegetation were also noted. The 100-N-19 waste site was used for disposal of nonhazardous debris from the 100-N Area and the Hanford Generating Plant (HGP). Although the HGP is geographically located within the 100-NR-1 boundary, it is not part of the 100-NR-1 source operable unit. The entire 100-N-19 waste site has been disturbed through past use as a borrow pit and by dumping of miscellaneous construction and demolition debris (WCH 2011a). The 100-N-19 waste site was reclassified as "Rejected" in the Waste Information Data System in July 2004 (BHI 2004).

GEOPHYSICAL SURVEY

A geophysical survey was performed at the 100-N-93 waste site in October 2010 with the objective of detecting potentially buried features (WCH 2010a). Ground-penetrating radar and electromagnetic induction data were collected from the accessible areas of the site, as indicated by the gray shading on the geophysical interpretation map overlain on the waste site confirmatory sampling location map (Figure 2). No data were collected where there were thick concentrations of tumbleweeds or along the steep slopes that surround the site. The geophysical survey data indicated concentrations of metallic anomalies throughout the site that had the characteristics of debris. Many of the geophysical anomalies correlated with debris that was exposed at the surface; however, the data suggested that additional debris was buried within the site. The geophysical survey data were used to select the test pit and test trench locations for confirmatory sampling.

CONFIRMATORY SAMPLING ACTIVITIES

Contaminants of Potential Concern

The COPCs for confirmatory sampling were determined based on professional judgment and historical documentation. The COPCs included asbestos, cadmium, chromium, lead, mercury, and nickel. In addition, polychlorinated biphenyls (PCBs) were included as a COPC at the garnet sand location FS-5 (Figure 2), because of the possibility that the garnet sand was used to sandblast paint that contained PCBs. Although not considered COPCs, antimony, arsenic, barium, beryllium, boron, cobalt, copper, manganese, molybdenum, selenium, silver, vanadium, and zinc were included with analysis of the expanded list of inductively coupled plasma (ICP) metals (WCH 2010b).

During confirmatory sampling activities, suspected hydrocarbons were noted at sampling location FS-2; therefore, total petroleum hydrocarbons (TPH), semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAH), and PCBs were added as COPCs at the FS-2 location. Radiological activity was not detected in the field during confirmatory sampling activities; therefore, analyses for radionuclides were not performed (WCH 2011b).

Figure 1. 100-N-93 Waste Site Location Map.

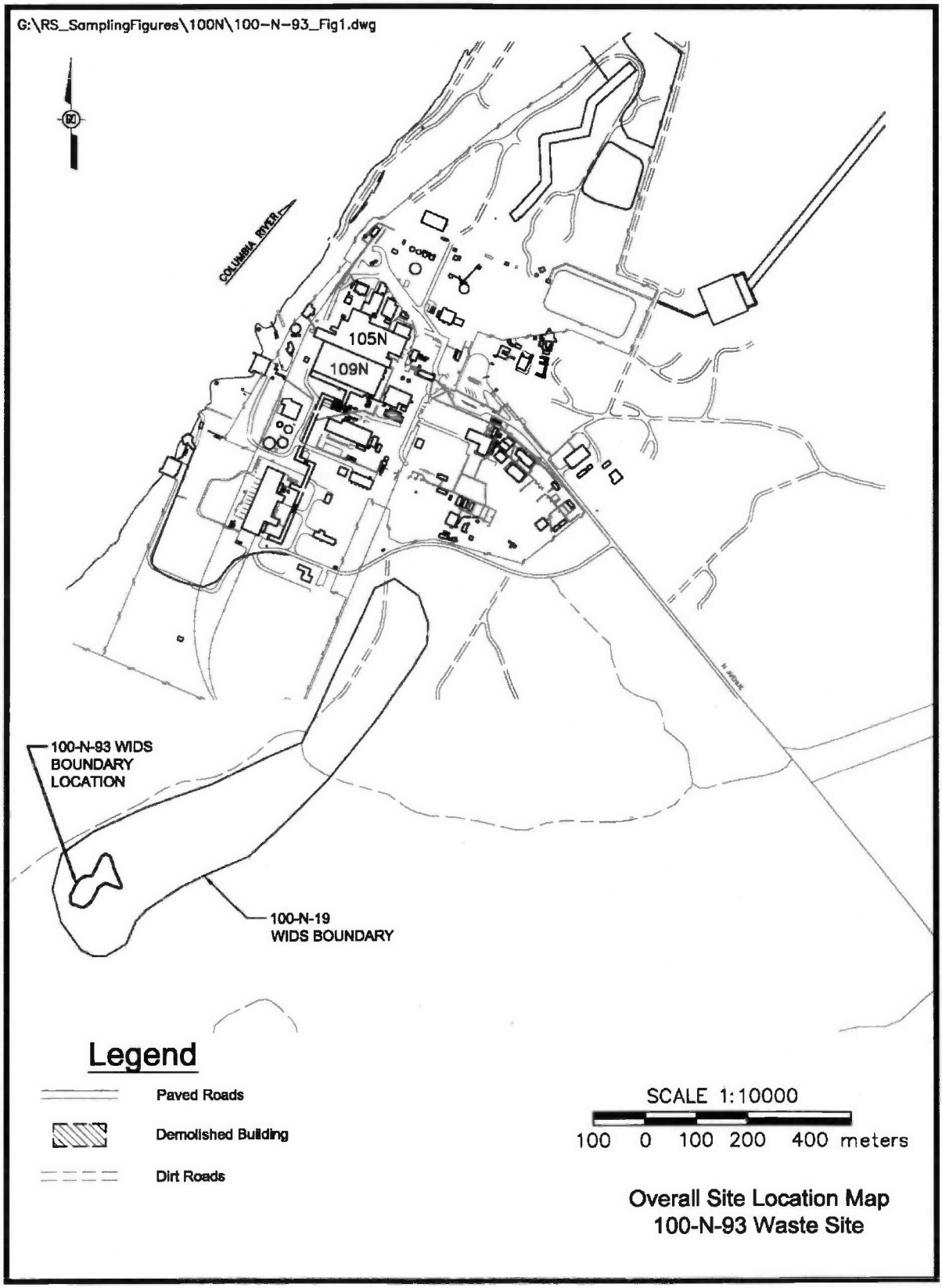
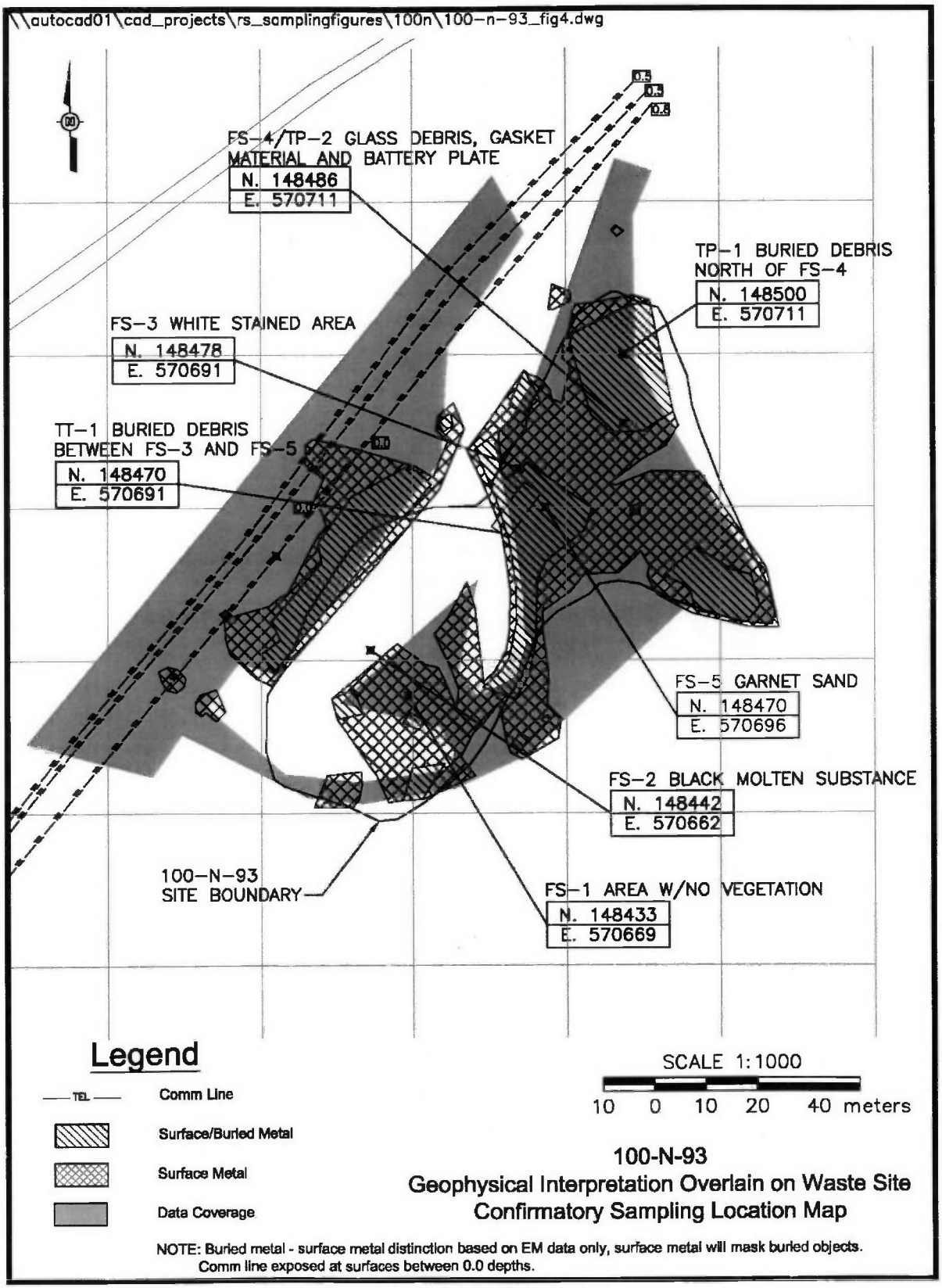


Figure 2. Geophysical Interpretation Overlain on Confirmatory Sampling Locations.



Confirmatory Sample Design and Sample Results

Confirmatory sampling was conducted at the 100-N-93 waste site on January 20 and 24, 2011, per the *Work Instruction for Confirmatory Sampling of the 100-N-93, 100-N Stain Area #2* (WCH 2010b). Discrete soil samples were collected from the surface of each location unless otherwise noted as described in Table 1. The confirmatory sample locations overlain on the geophysical survey map are shown in Figure 2.

Table 1. Confirmatory Sample Summary.

Sample Location	Sample Description	HEIS Sample Number	Washington State Plane Coordinates		Sample Analysis
			Northing (m)	Easting (m)	
FS-1	Soil, surface	J1D493	148433	570669	ICP metals [a], mercury
		J1D4B2			Asbestos
FS-2	Soil with black tar substance	J1D494	148442	570661	ICP metals [a], mercury, PAH, PCBs, SVOA, TPH
		J1D4B3			Asbestos
FS-3	Soil under white material	J1D495	148478	570690.8	ICP metals [a], mercury
		J1D4B4			Asbestos
FS-3	Other solid, white material	J1D4C3	148478	570690.8	ICP metals [a], mercury
		J1D4C1			Asbestos
FS-4	Soil, surface	J1D496	148486	570711	ICP metals [a], mercury
		J1D4B5			Asbestos
FS-4	Other solid, gasket material	J1D4C2	148486	570711	Asbestos
FS-5	Soil and garnet sand	J1D497	148470	570696	ICP metals [a], mercury, PCBs
		J1D4B6			Asbestos
Duplicate of FS-5	Soil and garnet sand	J1D499	148470	570696	ICP metals [a], mercury, PCBs
		J1D4B8			Asbestos
TP-1	Soil, ~ 1.8 m (6 ft) bgs	J1D4B0	148500	570711	ICP metals [a], mercury
		J1DW89			Asbestos
TP-2	Soil, ~ 0.6 m (2 ft) bgs	J1D4B1	148486	570711	ICP metals [a], mercury
		J1DW90			Asbestos
TT-1	Soil, ~ 1.8 m (6 ft) bgs	J1D498	148470	570691	ICP metals [a], mercury, PCBs
		J1D4B7			Asbestos
Equipment blank	Silica sand	J1D492	NA	NA	ICP metals [a], mercury

[a] The expanded list of ICP metals was performed to include antimony, arsenic, barium, beryllium, boron, cadmium, chromium (total), cobalt, copper, lead, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc.

bgs = below ground surface
HEIS = Hanford Environmental Information System
ICP = inductively coupled plasma
NA = not applicable
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons

Confirmatory sampling results for the 100-N-93 waste site are included in Appendix B. All areas sampled exceeded remedial action goals (RAGs) with the exception of TP-2. The waste site was recommended for remove, treat, and dispose based on the results of confirmatory sampling and field observations prior to confirmatory sampling (WCH 2011a).

REMEDIAL ACTION SUMMARY

Remedial action at the 100-N-93 waste site was performed between March 26, 2013, and March 21, 2014. The depth of the remediation ranged from 4.6 to 6.1 m (15 to 20 ft) below ground surface resulting in approximately 35,551 bank cubic meters (46,499 bank cubic yards) of soil and debris being removed for disposal at the Environmental Restoration Disposal Facility (ERDF). The debris consisted of lead-acid batteries, asbestos, miscellaneous steel, burnt wood, glass, concrete, empty steel drums, wire, garnet sand, and communications cable. All waste material was loaded directly from the waste site into the ERDF disposal containers; therefore, no waste staging pile area was created. Additionally, there is no overburden soil stockpile associated with the waste site. No anomalous materials were encountered during the remediation.

Several in-process soil samples and miscellaneous material samples were collected from the 100-N-93 waste site during and at the completion of field remediation. The data are presented in Appendix B. Photographs taken during and at the completion of remediation are presented in Figures 3 through 10. A post-remediation walkaround boundary survey was conducted following remedial action activities. The post-remediation survey is provided in Figure 11.

VERIFICATION SAMPLING ACTIVITIES

Verification soil sampling was conducted on May 15, 2014, per the *Work Instruction for Verification Sampling of the 100-N-93, 100-N Stain Area #2* (WCH 2014b). Sampling was conducted to support a determination that residual contaminant concentrations in the soil meet cleanup criteria specified in the 100-N Area RDR/RAWP (DOE-RL 2013) and 100-N Area ROD (EPA 1999).

The verification sample results are provided in Appendix C and indicate that the waste removal action achieved compliance with the remedial action objectives (RAOs) and RAGs for the 100-N-93 waste site. The following subsections provide additional discussion of the information used to develop the verification sampling design. The statistical results of verification sampling are also summarized to support interim closure of the site. A more detailed discussion of the verification sampling can be found in the *Work Instruction for Verification Sampling of the 100-N-93, 100-N Stain Area #2* (WCH 2014b).

Figure 3. 100-N-93 Excavation and Loadout (March 27, 2013).

Figure 4. 100-N-93 Excavation and Loadout (April 3, 2014).

Figure 5. 100-N-93 Excavation (April 30, 2013).

Figure 6. 100-N-93 Excavation and Loadout (June 26, 2013).

Figure 7. 100-N-93 Excavation and Loadout (August 14, 2013).

Figure 8. 100-N-93 Excavation and Loadout (October 2, 2013).

Figure 9. 100-N-93 Waste Site Looking South (April 2014).

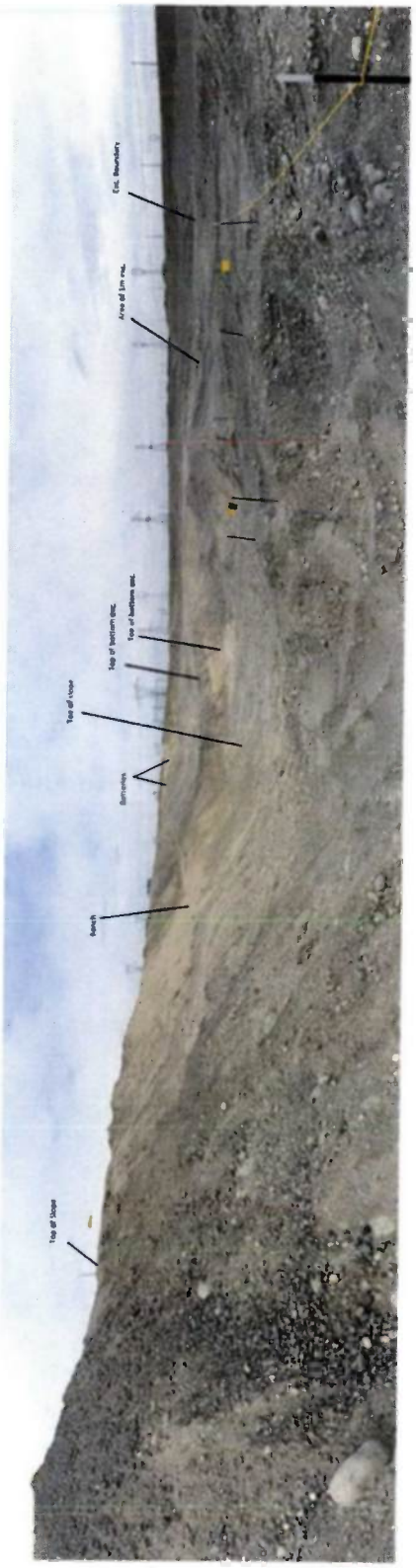


Figure 10. 100-N-93 Waste Site Looking Northwest (April 2014).

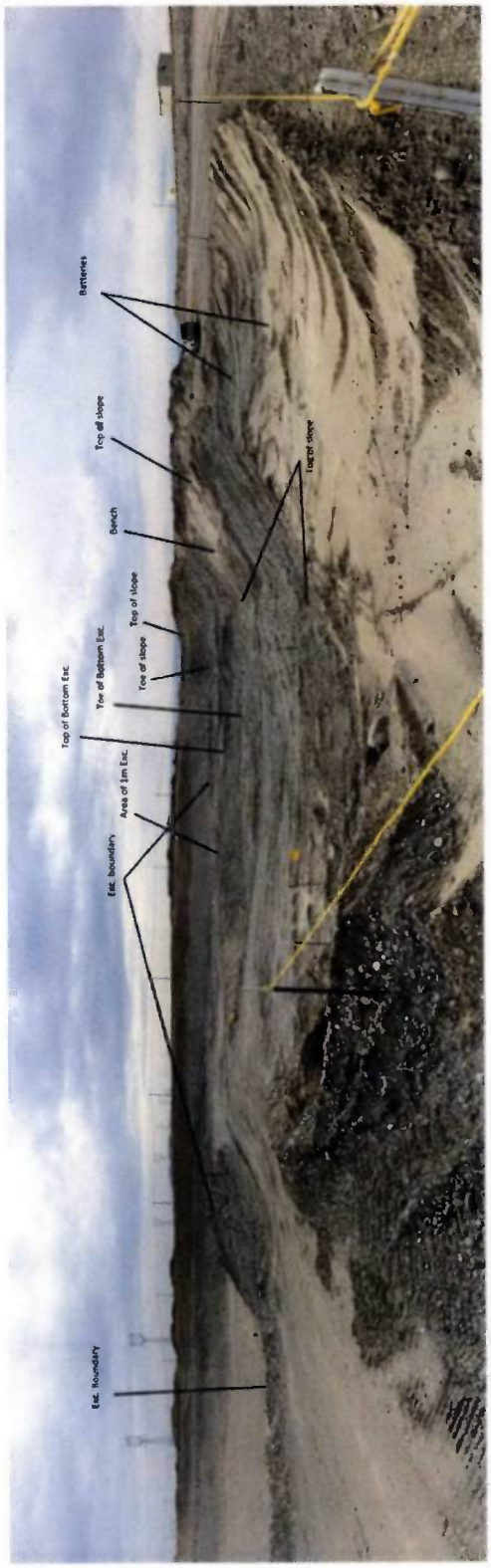
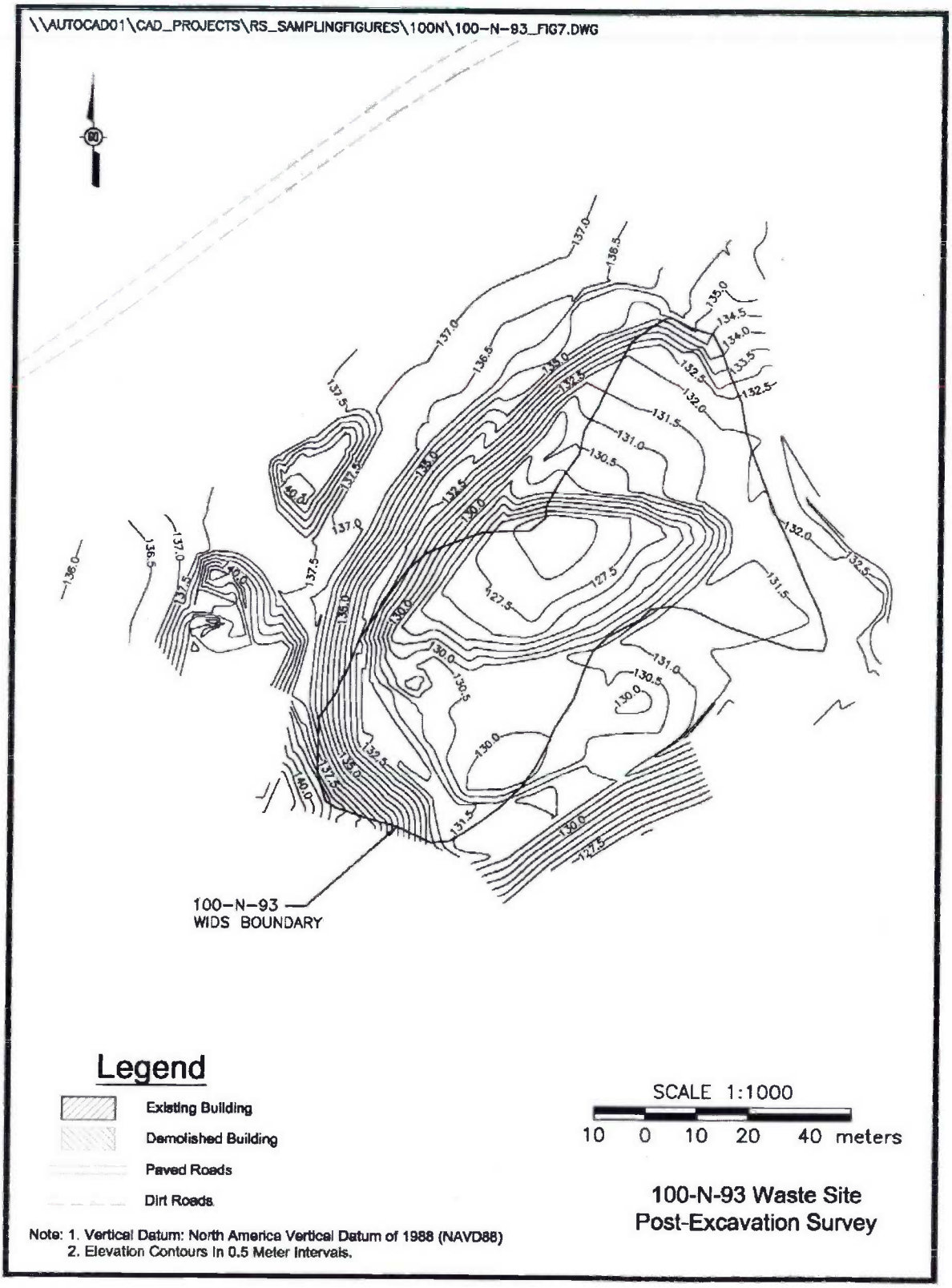


Figure 11. 100-N-93 Post-Excavation Civil Survey.



Contaminants of Potential Concern

Antimony, arsenic, barium, cadmium, chromium, copper, lead, manganese, mercury, molybdenum, nickel, selenium, silver, zinc, TPH, PAH, PCBs, and SVOCs were detected above RAGs in the confirmatory samples and/or waste characterization samples; therefore, they were retained as site COPCs. Asbestos fibers were detected in confirmatory samples; therefore, asbestos was retained as a site COPC. Although not considered as COPCs, beryllium, boron, cobalt, and vanadium were included in the expanded list of ICP metals. The confirmatory sampling data, waste characterization sampling data, and in-process soil sampling data are provided in Appendix B.

The analytical methods that were performed to evaluate the site COPCs are provided in Table 2.

Table 2. Laboratory Analytical Methods for the 100-N-93 Waste Site.

Analytical Method	Contaminants of Potential Concern
ICP metals[a] – EPA Method 6010	Antimony, arsenic, barium, cadmium, chromium, copper, lead, manganese, molybdenum, nickel, selenium, silver, zinc
Mercury – EPA Method 7471	Mercury
PAH – EPA Method 8310	Polycyclic aromatic hydrocarbons
PCBs – EPA Method	Polychlorinated biphenyls
TPH – NWTPH-Dx Northwest	Total petroleum hydrocarbons
SVOA – EPA Method 8270	Semivolatile organic compounds
Bulk asbestos – NIOSH Method 7400	Asbestos

[a] The expanded list of ICP metals included antimony, arsenic, barium, beryllium, boron, cadmium, chromium (total), cobalt, copper, lead, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc.

EPA = U.S. Environmental Protection Agency
ICP = inductively coupled plasma
NWTPH-Dx = Northwest total petroleum hydrocarbons – diesel range organics
NIOSH = National Institute for Occupational Safety and Health
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons

Verification Sample Design

One decision unit was identified for the 100-N-93 waste site. Twelve statistical soil samples plus one duplicate and one split were collected from the decision unit. Additionally, 16 focused soil samples plus 1 duplicate and 1 split were collected from locations where waste materials were located and confirmatory, waste characterization, and/or in-process samples were collected and failed direct exposure RAGs for one or more contaminants.

All sampling was performed in accordance with ENV-1, *Environmental Monitoring & Management*, to fulfill the requirements of the *100-N Area Sampling and Analysis Plan for CERCLA Waste Sites* (DOE-RL 2006). All samples were grab samples collected at the predetermined coordinates. Additional information related to verification sampling can be found in the field sampling logbook (WCH 2014a). The verification sample summary is provided in Table 3, and the sample locations are shown in Figure 12.

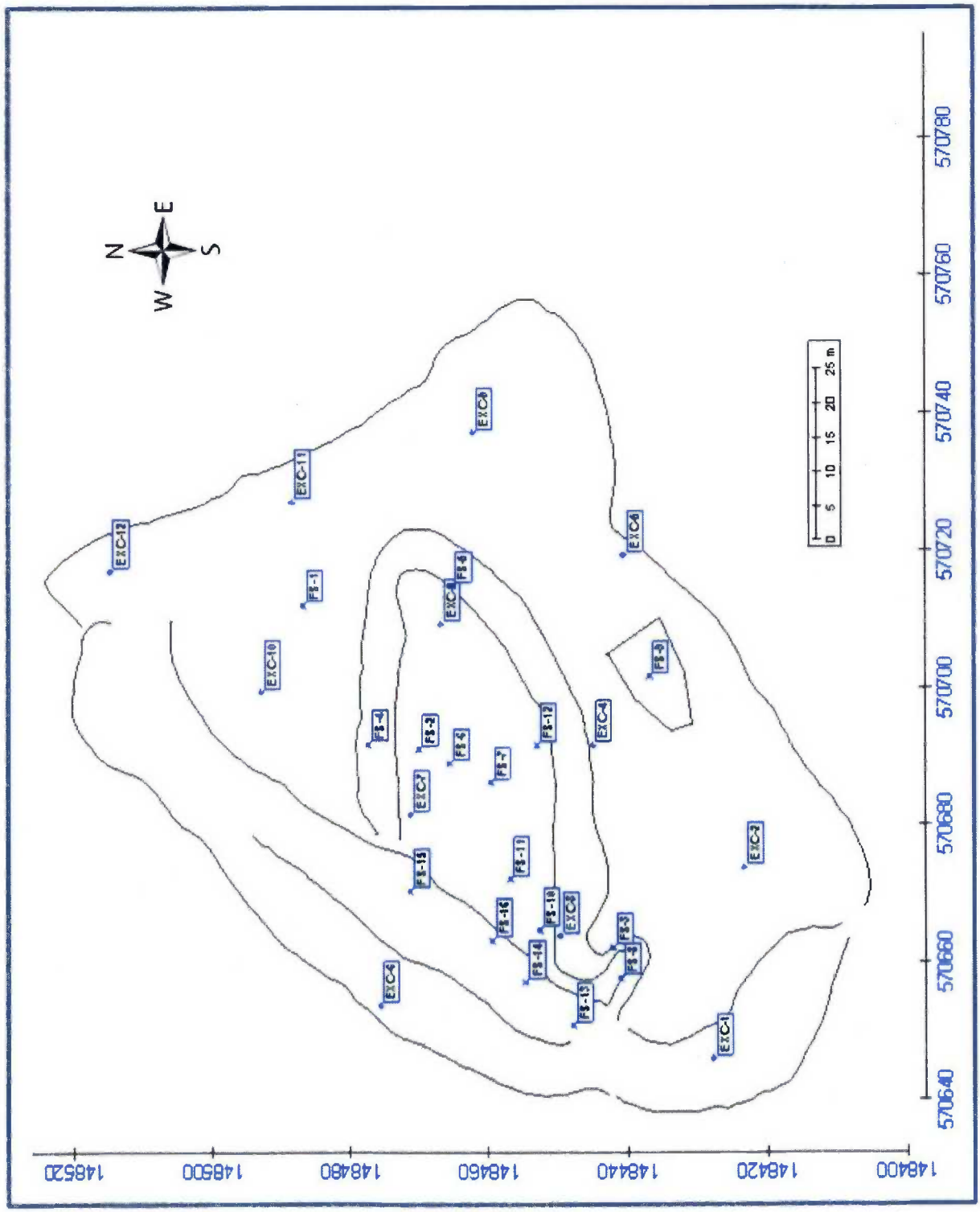
Table 3. 100-N-93 Waste Site Verification Sample Summary Table.

Sample Location	HEIS Sample Number (Chemical)	HEIS Sample Number (Asbestos)	Washington State Plane Coordinates		Sample Analysis
			Northing	Easting	
EXC-1	J1TPK8	J1TPM1	148427.8	570646.0	ICP metals [a], mercury, PAH, PCBs, SVOAs, TPH, asbestos
EXC-2	J1TPK9	J1TPM2	148423.3	570673.7	
EXC-3	J1TPL0	J1TPM3	148449.5	570663.7	
EXC-4	J1TPL1	J1TPM4	148445.0	570691.5	
EXC-5	J1TPL2	J1TPM5	148440.5	570719.2	
EXC-6	J1TPL3	J1TPM6	148475.8	570653.8	
EXC-7	J1TPL4	J1TPM7	148471.3	570681.5	
EXC-8	J1TPL5	J1TPM8	148466.8	570709.3	
EXC-9	J1TPL6	J1TPM9	148462.3	570737.0	
EXC-10	J1TPL7	J1TPN0	148493.1	570699.3	
EXC-11	J1TPL8	J1TPN1	148488.6	570727.0	
EXC-12	J1TPL9	J1TPN2	148514.9	570717.0	
Duplicate of EXC-7	J1TPM0	J1TPN3	148471.3	570681.5	
Split of EXC-7	J1TPN4	J1TPN5	148471.3	570681.5	
FS-1	J1TPN6	J1TPP6	148487.0	570712.0	ICP metals [a], mercury, PAH, PCBs, SVOA, TPH, asbestos
FS-2	J1TPN7	J1TPP7	148470.0	570691.0	
FS-3	J1TPN8	J1TPP8	148442.0	570662.0	
FS-4	J1TPN9	J1TPP9	148477.4	570691.7	
FS-5	J1TPP0	J1TPR0	148465.2	570714.7	
FS-6	J1TPP1	J1TPR1	148465.6	570689.0	
FS-7	J1TPP2	J1TPR2	148459.6	570686.1	
FS-8	J1TPP3	J1TPR3	148440.9	570657.6	
Duplicate of FS-2	J1TPP4	J1TPR4	148470.0	570691.0	
Split of FS-2	J1TPT3	J1TPT4	148470.0	570691.0	
FS-9	NA	J1TPR5	148436.8	570701.6	Asbestos
FS-10	NA	J1TPR6	148452.6	570664.6	
FS-11	NA	J1TPR7	148456.9	570672.0	
FS-12	NA	J1TPR8	148452.9	570691.6	
FS-13	NA	J1TPR9	148447.8	570650.8	
FS-14	NA	J1TPT0	148454.7	570657.1	
FS-15	NA	J1TPT1	148471.3	570670.5	
FS-16	NA	J1TPT2	148459.4	570663.1	
Equipment blank	J1TPP5	NA	NA	NA	ICP metals [a], mercury

[a] Analysis for the expanded list of ICP metals was performed to include antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, lead, manganese, molybdenum, nickel, selenium, silver, vanadium, and zinc.

HEIS = Hanford Environmental Information System
ICP = inductively coupled plasma
NA = not applicable
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons

Figure 12. Statistical and Focused Verification Sample Locations for the 100-N-93 Waste Site.



Verification Sample Results

All verification samples were analyzed using EPA-approved analytical methods. Evaluation of the verification data from the 100-N-93 waste site was performed by direct comparison of the statistical or maximum sample results for each COPC against the cleanup criteria.

The primary statistical calculation to evaluate compliance with cleanup standards is the 95% upper confidence limit (UCL) on the arithmetic mean of the data. The 95% UCL values for each detected COPC are computed for the 100-N-93 waste site decision unit as specified by the 100-N Area RDR/RAWP (DOE-RL 2013). The calculations are provided in Appendix C. When a nonradionuclide COPC was detected in fewer than 50% of the verification samples collected for the decision unit, the maximum detected value was used for comparison to the RAGs. If no detections for a given COPC were reported in the data set, then no statistical calculation or evaluation was performed for that COPC. The sample results for each focused sample were evaluated using the maximum detected concentration for each COPC and comparing the value directly to the RAG.

Comparisons of the results for each COPC from the 100-N-93 waste site against the RAGs are summarized in Tables 4 and 5. Contaminants that were not detected by laboratory analysis are excluded from the tables. Calculated cleanup levels are not presented in the Cleanup Levels and Risk Calculations Database (Ecology 2014) under WAC 173-340-740(3) for calcium, magnesium, potassium, silicon, and sodium. The EPA's *Risk Assessment Guidance for Superfund* (EPA 1989) recommends that aluminum and iron not be considered in site risk evaluations. Therefore, aluminum, calcium, iron, magnesium, potassium, silicon, and sodium are not considered site COPCs and are also not included in the table. The complete laboratory results for all constituents are stored in the Environmental Restoration (ENRE) project-specific database prior to archival in the Hanford Environmental Information System (HEIS) and are presented in Attachment 1 of the 95% UCL calculations (Appendix C).

DATA EVALUATION

This section demonstrates that contaminant concentrations at the 100-N-93 waste site achieve the applicable RAGs developed to support unrestricted land use at the 100 Area as established in the 100-N Area ROD (EPA 1999) and documented in the 100-N Area RDR/RAWP (DOE-RL 2013).

Table 4. Comparison of Contaminant Concentrations to Remedial Action Goals for the 100-N-93 Statistical Verification Samples.

COPC	Statistical or Maximum Result [b] (mg/kg)	Remedial Action Goals (mg/kg) [a]			Does the Result Exceed RAGs?	Does the Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Arsenic	3.0 (<BG)	20 [c]	20 [c]	20 [c]	No	--
Barium	56.0 (<BG)	16,000 [d]	200	400	No	--
Beryllium	0.25 (<BG)	10.4 [e]	1.51 [c]	1.51 [c]	No	--
Cadmium [f]	0.10 (<BG)	13.9 [e]	0.81 [c]	0.81 [c]	No	--
Chromium	11.0 (<BG)	120,000 [d]	18.5 [c]	18.5 [c]	No	--
Cobalt	7.5 (<BG)	1,600 [d]	32	-- [g]	No	--
Copper	18.2 (<BG)	2,960 [d]	59.2	22.0 [c]	No	--
Lead	3.5 (<BG)	353	10.2 [c]	10.2 [c]	No	--
Manganese	276 (<BG)	11,200 [d]	512 [c]	-- [g]	No	--
Molybdenum [h]	0.39	400 [d]	8	-- [g]	No	--
Nickel	11.6 (<BG)	1,600 [d]	19.1 [c]	27.4	No	--
Vanadium	43.5 (<BG)	560 [d]	85.1 [c]	-- [g]	No	--
Zinc	36.0 (<BG)	24,000 [d]	480	67.8 [c]	No	--
Dimethyl phthalate	0.035	80,000 [d]	1,600	14,400	No	--
TPH – diesel range ext.	10	200	200	200	No	--
TPH – diesel range	4.2	200	200	200	No	--

[a] RAGs obtained from the 100-N Area RDR/RAWP (DOE-RL 20013).
[b] Maximum or 95% UCL, depending on data censorship, as described in the *100-N-93 Waste Site Cleanup Verification 95% UCL Calculations* (Appendix C).
[c] Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d) (Ecology 1996). The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement project managers as discussed in Section 2.1.2.1 of the 100-N Area RDR/RAWP (DOE-RL 2013).
[d] Noncarcinogenic cleanup level calculated per WAC 173-340-740, Method B, 1996.
[e] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], Ecology 1996) using an airborne particulate mass-loading rate of 0.0001 g/m^3 (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).
[f] Hanford Site-specific background not available. Value is Washington State background from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).
[g] No parameters (bioconcentration factors or AWQC values) are available from the Ecology Cleanup Levels and Risk Calculations database or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], 1996 [Method B for surface waters]).
[h] No Hanford Site-specific or Washington State background value available.

-- = not applicable
AWQC = ambient water quality criteria
BG = background
COPC = contaminant of potential concern
RAG = remedial action goal
RDR/RAWP = Remedial Design Report/Remedial Acton Work Plan
RESRAD = RESidual RADioactivity
TPH = total petroleum hydrocarbons
UCL = upper confidence limit
WAC = *Washington Administrative Code*

Table 5. Comparison of Contaminant Concentrations to Remedial Action Goals for the 100-N-93 Focused Verification Samples.

COPC	Maximum Result [b] (mg/kg)	Remedial Action Goals (mg/kg) [a]			Does the Result Exceed RAGs?	Does the Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Arsenic	4.1 (<BG)	20 [c]	20 [c]	20 [c]	No	--
Barium	64.4 (<BG)	16,000 [d]	200	400	No	--
Beryllium	0.33 (<BG)	10.4 [e]	1.51 [c]	1.51 [c]	No	--
Cadmium [f]	0.11 (<BG)	13.9 [e]	0.81 [c]	0.81 [c]	No	--
Chromium	16.4 (<BG)	120,000 [d]	18.5 [c]	18.5 [c]	No	--
Cobalt	8.7 (<BG)	1,600 [d]	32	-- [g]	No	--
Copper	20.1 (<BG)	2,960 [d]	59.2	22.0 [c]	No	--
Lead	4.0 (<BG)	353	10.2 [c]	10.2 [c]	No	--
Manganese	315 (<BG)	11,200 [d]	512 [c]	-- [g]	No	--
Molybdenum [h]	0.88	400 [d]	8	-- [g]	No	--
Nickel	15.5 (<BG)	1,600 [d]	19.1 [c]	27.4	No	--
Vanadium	55.0 (<BG)	560 [d]	85.1 [c]	-- [g]	No	--
Zinc	39.6 (<BG)	24,000 [d]	480	67.8 [c]	No	--
TPH – diesel range ext.	14	200	200	200	No	--
TPH – diesel range	6.4	200	200	200	No	--
Benzo(a)anthracene [i]	U/0.029 [j]	1.37 [k]	0.015 [l]	0.015 [l]	Yes	Yes [m]
Benzo(a)pyrene [i]	U/0.021 [j]	0.137 [k]	0.015 [l]	0.015 [l]	Yes	Yes [m]
Chrysene [i]	0.011/0.036 [j]	137 [k]	1.2	0.10 [l]	No	--
Fluoranthene	0.017/0.053 [j]	3,200 [d]	64	18.0	No	--
Phenanthrene [n]	U/0.038 [j]	24,000 [d]	240	1,920	No	--
Pyrene	0.020/0.059 [j]	2,400 [d]	48	192	No	--

[a] RAGs obtained from the 100-N Area RDR/RAWP (DOE-RL 20013), or the 100 Area RDR/RAWP (DOE-RL 2009) where indicated.
[b] Maximum results, as described in the *100-N-93 Waste Site Cleanup Verification 95% UCL Calculations* (Appendix C).
[c] Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d) (Ecology 1996). The arsenic cleanup level of 20 mg/kg has been agreed to by the Tri-Party Agreement project managers as discussed in Section 2.1.2.1 of the 100-N Area RDR/RAWP (DOE-RL 2013).
[d] Noncarcinogenic cleanup level calculated from WAC 173-340-740, Method B (Ecology 1996).
[e] Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], Ecology 1996) using an airborne particulate mass-loading rate of 0.0001 g/m^3 (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).
[f] Hanford Site-specific background not available. Value is Washington State background from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).
[g] No parameters (bioconcentration factors or ambient water quality criteria values) are available from the Ecology Cleanup Levels and Risk Calculations database or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], 1996 [Method B for surface waters]).
[h] No Hanford Site-specific or Washington State background value available.
[i] Remedial action goals obtained from the 100 Area RDR/RAWP (DOE-RL 2009).
[j] Results from EPA method 8310 (polycyclic aromatic hydrocarbons) and method 8270 (semivolatile organic compounds) are shown, respectively.
[k] Carcinogenic cleanup level calculated from WAC 173-340-740, Method B, Ecology 1996.
[l] Where cleanup levels are less than RDLs, cleanup levels default to RDLs per WAC 173-340-707(2) (Ecology 1996).
[m] Based on RESRAD modeling discussed in Appendix C of the 100-N Area RDR/RAWP (DOE-RL 2013), the residual concentrations of benzo(a)anthracene and benzo(a)pyrene are not predicted to migrate vertically within 1,000 years (based on the lowest soil-partitioning coefficient of the contaminants [benzo(a)pyrene] of 360 mL/g). A contaminant with a soil-partitioning coefficient of 80 mL/g or greater is not predicted to migrate vertically through the soil. Therefore, the residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.
[n] Toxicity data for phenanthrene in not available. Cleanup levels are based on the surrogate chemical anthracene.

-- = not applicable
BG = background
COPC = contaminant of potential concern
EPA = U.S. Environmental Protection Agency
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = Remedial Design Report/Remedial Acton Work Plan
RESRAD = RESidual RADioactivity (dose model)
TPH = total petroleum hydrocarbons
U = undetected
WAC = *Washington Administrative Code*

Attainment of Nonradionuclide RAGS

Tables 4 and 5 compare the cleanup verification sample values for the 100-N-93 waste site excavation to the applicable soil RAGs for direct exposure, protection of groundwater, and protection of the Columbia River. All COPCs were quantified below direct exposure RAGs. All COPCs were quantified below groundwater and/or river protection soil RAGs with the exception of benzo(a)anthracene and benzo(a)pyrene. However, based on RESidual RADioactivity (RESRAD) modeling discussed in Appendix C of the 100-N Area RDR/RAWP (DOE-RL 2013), residual concentrations of benzo(a)anthracene and benzo(a)pyrene are not predicted to migrate vertically in 1,000 years (based on the lowest soil-partitioning coefficient of these contaminants [benzo(a)pyrene] of 360 mL/g). A contaminant with a soil-partitioning coefficient of 80 mL/g or greater is not predicted to migrate vertically through the soil. Therefore, the residual concentrations of benzo(a)anthracene and benzo(a)pyrene are predicted to be protective of groundwater and the Columbia River. All asbestos results were reported as nondetected in soil.

Three-Part Test for Nonradionuclides

A RAG requirement for nonradionuclide statistical data sets is the WAC 173-340-740(7)(e) three-part test, which consists of the following criteria: (1) the cleanup verification 95% UCL value must be less than the cleanup level, (2) no single detection shall exceed two times the cleanup criteria, and (3) the percentage of samples exceeding the cleanup criteria must be less than 10% of the data set.

The application of the three-part test for the 100-N-93 waste site is included in the *100-N-93 Waste Site Cleanup Verification 95% UCL Calculations* in Appendix C of this remaining sites verification package, where half or more of the data set was detected. The results of this evaluation indicate that residual COPC concentrations pass the three-part test in comparison against applicable RAGs and are protective of groundwater and the Columbia River.

An additional application of the three-part test is included for the statistical data sets that default to the maximum because less than half of the data set was detected. The results of this evaluation indicate that residual COPC concentrations pass the three-part test in comparison against applicable RAGs.

Nonradionuclide Direct Contact Hazard Quotient and Carcinogenic Risk RAGs Attained

Nonradionuclide risk requirements include an individual hazard quotient of less than 1.0, a cumulative hazard quotient of less than 1.0, an individual contaminant carcinogenic risk of less than 1×10^{-6}, and a cumulative carcinogenic risk of less than 1×10^{-5}. For the 100-N-93 waste site, these risk values were not calculated for constituents that were either not detected or were detected at concentrations below Hanford Site or Washington State background. Although TPH (diesel and diesel range extended) were detected and no background value is available, the risk associated with TPH does not contribute to the cumulative toxicity calculation. All individual hazard quotients for noncarcinogenic constituents are less than 1.0. The cumulative hazard quotient for those noncarcinogenic constituents above background or detected levels is 2.2×10^{-3}. The individual carcinogenic risk values for the carcinogenic constituents detected above background are less than 1×10^{-6}, and the cumulative carcinogenic risk value is 1.7×10^{-7}, which is less than 1×10^{-5}. The 100-N-93 waste site meets the requirements for the direct

contact hazard quotient and excess carcinogenic risk as identified in the 100-N Area RDR/RAWP (DOE-RL 2013).

Nonradionuclide Groundwater Hazard Quotient and Carcinogenic Risk RAGs Attained

Assessment of the risk requirements for the 100-N-93 waste site included a calculation of the hazard quotient and carcinogenic (excess cancer) risk values for groundwater protection for nonradionuclides. The requirements include an individual and cumulative hazard quotient of less than 1.0, an individual excess carcinogenic risk of less than 1×10^{-6}, and a cumulative excess carcinogenic risk of less than 1×10^{-5}. Risk values were calculated for constituents that were detected at concentrations above Hanford Site or Washington State background values or for which there is no background value. In addition, the soil-partitioning coefficients for these contaminants must be less than that necessary to show no migration to groundwater in 1,000 years based on RESRAD modeling discussed in Appendix C of the 100-N Area RDR/RAWP (DOE-RL 2013). Based on this model and a vadose zone of approximately 9 m (29.5 ft) in thickness, a K_d of 7.9 or greater is required to show no predicted migration to groundwater in 1,000 years. The hazard quotient for dimethyl phthalate, the only constituent subject to the groundwater hazard quotient calculation, is 2.2×10^{-5}, which is less than 1.0. No carcinogenic soil constituents met the criteria for groundwater protection evaluation at the 100-N-93 waste site; therefore, no calculations of excess carcinogenic risk were performed. Therefore, nonradionuclide risk requirements related to groundwater are met.

DATA QUALITY ASSESSMENT

A data quality assessment (DQA) was performed to compare the verification sampling approach (WCH 2014b), the field logbook (WCH 2014a), and resulting analytical data with the sampling and data quality requirements specified by the project objectives and performance specifications.

The DQA for the 100-N-93 waste site established that the data are of the right type, quality, and quantity to support site closeout decisions within specified error tolerances. The evaluation verified that the sample design was sufficient for the purpose of clean site verification. The cleanup verification sample analytical data are stored in the ENRE project-specific database for data evaluation prior to archival in the HEIS and are summarized in Appendix C. The detailed DQA is presented in Appendix D.

SUMMARY FOR INTERIM CLOSURE

The 100-N-93 waste site has been evaluated in accordance with the 100-N Area ROD (EPA 1999) and the 100-N Area RDR/RAWP (DOE-RL 2013). Verification sampling was performed, and the analytical results indicate that the residual concentrations of COPCs at the site meet the RAOs for direct exposure, groundwater protection, and river protection.

In accordance with this evaluation, the verification sampling results support a reclassification of the 100-N-93 waste site to Interim Closed Out. Contamination above direct exposure levels was not observed in the shallow zone or deep zone soils and is concluded to not exist further into the

deep zone soils. Institutional controls to prevent uncontrolled drilling or excavation into the deep zone of the sites are not required.

The 100-N-93 waste site was located within the 100-N Area borrow pit, and the soil surrounding and underlying the remediated waste site will be used as backfill material at other 100-N Area waste sites. Residual contamination below the remediated waste site meets the groundwater/river cleanup criteria and does not preclude the use of the underlying and surrounding soil as backfill providing the fill material is placed more than 1 m (3.3 ft) above the groundwater table.

Because the remediated 100-N-93 waste site was located within the 100-N borrow pit, the waste site will not be backfilled and revegetated as outlined in the 100-N Area RDR/RAWP (DOE-RL 2013). Recontouring and revegetation of the 100-N-93 waste site will occur as part of the 100-N borrow pit closure in accordance with the *Expansion of Borrow Areas on the Hanford Site – Mitigation Action Plan for DOE/EA-1934* (WCH 2013).

REFERENCES

40 CFR 141, "National Primary Drinking Water Regulations," *Code of Federal Regulations*, as amended.

BHI, 2001, *Calculation of Total Uranium Activity Corresponding to a Maximum Contaminant Level for Total Uranium of 30 Micrograms per Liter in Groundwater*, 0100X-CA-V0038, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2004, "Contract No. DE-AC06-93RL12367, Transmittal of Approved Waste Site Reclassification Forms for the 100-N-19 and 600-32 Sites," CCN 115097, external letter to K. R. Westover, U.S. Department of Energy, Richland Operations Office, from R. L. Donahoe, Bechtel Hanford, Inc., Richland, Washington, July 29.

DOE Order 5400.5, *Radiation Protection of the Public and the Environment,* as amended, U.S. Department of Energy, Washington, D.C.

DOE-RL, 2006, *100-N Area Sampling and Analysis Plan for CERCLA Waste Sites,* DOE/RL-2005-92, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2009, *Remedial Design Report/Remedial Action Work Plan for the 100 Areas,* DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2011, *Tri-Party Agreement Handbook Management Procedures,* RL-TPA-90-0001, Guideline Number TPA-MP-14, "Maintenance of the Waste Information Data System (WIDS)," Rev. 2, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2013, *Remedial Design Report/Remedial Action Work Plan for the 100-N Area,* DOE/RL-2005-93, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology, 1994, *Natural Background Soil Metals Concentrations in Washington State*, Publication No. 94-115, Washington State Department of Ecology, Olympia, Washington.

Ecology, 1996, "Model Toxics Control Act – Cleanup," *Washington Administrative Code* (WAC) 173-340, Washington State Department of Ecology, Olympia, Washington.

Ecology, 2014, Cleanup Levels and Risk Calculations (CLARC) Database, Washington State Department of Ecology, Olympia, Washington, <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.

ENV-1, *Environmental Monitoring & Management*, Washington Closure Hanford, Richland, Washington.

EPA, 1989, *Risk Assessment Guidance for Superfund: Volume 1, Human Health Evaluation Manual, Part A; Interim Final*, EPA/540/1-89/002, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1999, *Interim Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

EPA, 2011, *Explanation of Significant Differences for the 100-NR-1 and 100-NR-2 Operable Units Interim Remedial Action Record of Decision, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

WAC 173-340, 1996, "Model Toxics Control Act – Cleanup," *Washington Administrative Code.*

WCH, 2010a, *Geophysical Site Investigation Summary, 100-N-93 Waste Site Debris,* GI #0609819, Rev. 0, Washington Closure Hanford, Richland, Washington.

WCH, 2010b, *Work Instruction for Confirmatory Sampling of the 100-N-93, 100-N Stain Area #2,* 0100N-WI-G0021, Rev. 0, Washington Closure Hanford, Richland, Washington.

WCH, 2011a, "100-N-93, 100-N Stain Area #2 for Remedial Action," CCN 157732, Interoffice Memorandum to S. W. Callison from M. L. Proctor, Washington Closure Hanford, Richland, Washington, March 31.

WCH, 2011b, *Miscellaneous Sampling*, Logbook EL-1601-05, pp. 28-36, Washington Closure Hanford, Richland, Washington.

WCH, 2013, *Expansion of Borrow Areas on the Hanford Site – Mitigation Action Plan for DOE/EA-1934*, WCH-561, Rev. 0, Washington Closure Hanford, Richland, Washington.

WCH, 2014a, *100-N Field Remediation and Sampling*, Logbook EL-1652-12, pp. 2-8, Washington Closure Hanford, Richland, Washington.

WCH, 2014b, *Work Instruction for Verification Sampling of the 100-N-93, 100-N Stain Area #2,* 0100N-WI-G0091, Rev. 0, Washington Closure Hanford, Richland, Washington.

WDOH, 1997, *Hanford Guidance for Radiological Cleanup*, WDOH/320-015, Rev. 1, Washington State Department of Health, Olympia, Washington.

APPENDIX A

ECOLOGICAL RISK COMPARISON TABLE

Table A-1. Maximum Contaminant Concentrations that Exceed Ecological Screening Levels for the 100-N-93 Waste Site [a].

Hazardous Substance		2001 WAC 173-340 Table 749-3			EPA Ecological Soil Screening Levels [b]				Maximum Result
		Plants	Soil Biota	Wildlife	Plants	Soil Biota	Avian [c]	Mammalian [c]	
	Background	Metals (mg/kg)							
Manganese	512	1,100 [d]	NA	1,500	220	450	4,300	4,000	315 (<BG)
Vanadium	85.1	2	NA	NA	NA	NA	7.8	280	55.0 (<BG)

NOTE: Shaded cells indicate screening values that are exceeded.

[a] Exceedance of screening values does not necessarily indicate the existence of risk to ecological receptors. All exceedances must be evaluated in the context of additional lines of evidence for ecological effects following a baseline risk assessment for the river corridor portion of the Hanford Site, which will include a more complete quantitative ecological risk assessment.

[b] Available on the Internet at www.epa.gov/ecotox/ecossl.

[c] Wildlife.

[d] Benchmark replaced by Washington state natural background concentration from Ecology, 1994. *Natural Background Soil Metals Concentrations in Washington State*, Publication 94-115, Washington State Department of Ecology, Olympia, Washington.

BG = background
EPA = U.S. Environmental Protection Agency
NA = not available
WAC= *Washington Administrative Code*

APPENDIX B

CONFIRMATORY, WASTE CHARACTERIZATION, AND IN-PROCESS SAMPLE RESULTS

Table B-1. Confirmatory Sampling Results. (5 Pages)

Site Code	Sample Number	Sample Date/Time	Sample Area	Northing	Easting	Aluminum			Antimony			Arsenic		
						mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
100-N-93	J1D492	1/20/2011 10:30	Equipment blank	NA	NA	225		3.25	0.39	U	0.39	0.399	B	0.65
100-N-93	J1D493	1/20/2011 10:40	FS-1	148433	570669	6160		3.87	0.464	U	0.46	2.24		0.77
100-N-93	J1D494	1/20/2011 10:50	FS-2	148442	570662	6040		5.41	0.649	U	0.65	3.29		1.08
100-N-93	J1D495	1/20/2011 12:25	FS-3	148478	570691	4990		4.76	1.92		0.57	2.29		0.95
100-N-93	J1D496	1/20/2011 12:30	FS-4	148486	570711	8410		14.7	320		1.76	25.9		2.94
100-N-93	J1D497	1/20/2011 12:35	FS-5	148470	570696	1540		3.29	0.394	U	0.39	0.836		0.66
100-N-93	J1D498	1/20/2011 12:40	TT-1	148470	570691	9200		17.8	19.1		2.14	26.6		3.56
100-N-93	J1D499	1/20/2011 12:35	Duplicate of J1D497	148470	570696	1490		5.18	0.622	U	0.62	0.596	B	1.04
100-N-93	J1D4B0	1/24/2011 9:00	TP-1	148500	570711	9090		4.66	6.33		0.56	3		0.93
100-N-93	J1D4B1	1/24/2011 9:25	TP-2	148486	570711	9710		4.99	0.344	B	0.6	4.47		1
100-N-93	J1D4C3	1/20/2011 12:27	FS-3	148478	570691	2490		3.85	7.38		0.46	11		0.77

Site Code	Sample Number	Sample Date/Time	Sample Area	Northing	Easting	Barium			Beryllium			Boron		
						mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
100-N-93	J1D492	1/20/2011 10:30	Equipment blank	NA	NA	2.07		0.33	0.162		0.13	1.3	U	1.3
100-N-93	J1D493	1/20/2011 10:40	FS-1	148433	570669	53		0.39	0.2		0.16	1.45	B	1.55
100-N-93	J1D494	1/20/2011 10:50	FS-2	148442	570662	88.9		0.54	0.2	B	0.22	1.13	B	2.16
100-N-93	J1D495	1/20/2011 12:25	FS-3	148478	570691	119		0.48	0.185	B	0.19	3.41		1.91
100-N-93	J1D496	1/20/2011 12:30	FS-4	148486	570711	186		1.47	0.208	B	0.59	42.9		5.88
100-N-93	J1D497	1/20/2011 12:35	FS-5	148470	570696	28.4		0.33	0.048	B	0.13	1.31	U	1.31
100-N-93	J1D498	1/20/2011 12:40	TT-1	148470	570691	266		1.78	0.713	U	0.71	51.8		7.13
100-N-93	J1D499	1/20/2011 12:35	Duplicate of J1D497	148470	570696	19.8		0.52	0.207	U	0.21	2.07	U	2.07
100-N-93	J1D4B0	1/24/2011 9:00	TP-1	148500	570711	38.4		0.47	0.301		0.19	2.62		1.86
100-N-93	J1D4B1	1/24/2011 9:25	TP-2	148486	570711	90.8		0.5	0.322		0.2	2.33		2
100-N-93	J1D4C3	1/20/2011 12:27	FS-3	148478	570691	51.3		0.39	0.154	U	0.15	6.97		1.54

Site Code	Sample Number	Sample Date/Time	Sample Area	Northing	Easting	Cadmium			Calcium			Chromium		
						mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
100-N-93	J1D492	1/20/2011 10:30	Equipment blank	NA	NA	0.13	U	0.13	38.9	B	64.9	0.146		0.13
100-N-93	J1D493	1/20/2011 10:40	FS-1	148433	570669	0.178		0.16	4010		77.3	13.1		0.16
100-N-93	J1D494	1/20/2011 10:50	FS-2	148442	570662	0.318		0.22	6750		108	12.1		0.22
100-N-93	J1D495	1/20/2011 12:25	FS-3	148478	570691	0.932		0.19	10600		95.3	10.1		0.19
100-N-93	J1D496	1/20/2011 12:30	FS-4	148486	570711	8.25		0.59	17800		294	230		0.59
100-N-93	J1D497	1/20/2011 12:35	FS-5	148470	570696	0.137		0.13	1110		65.7	16.3		0.13
100-N-93	J1D498	1/20/2011 12:40	TT-1	148470	570691	5.62		0.71	35100		356	202		0.71
100-N-93	J1D499	1/20/2011 12:35	Duplicate of J1D497	148470	570696	0.126	B	0.21	701		104	8.53		0.21
100-N-93	J1D4B0	1/24/2011 9:00	TP-1	148500	570711	0.102	B	0.19	5340		93.2	16		0.19
100-N-93	J1D4B1	1/24/2011 9:25	TP-2	148486	570711	0.139	B	0.2	6490		99.9	16.7		0.2
100-N-93	J1D4C3	1/20/2011 12:27	FS-3	148478	570691	0.422		0.15	84000		385	22		0.15

Site Code	Sample Number	Sample Date/Time	Sample Area	Northing	Easting	Cobalt			Copper			Iron		
						mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
100-N-93	J1D492	1/20/2011 10:30	Equipment blank	NA	NA	1.3	U	1.3	0.649	U	0.65	775		13
100-N-93	J1D493	1/20/2011 10:40	FS-1	148433	570669	4.98		1.55	12		0.77	16800		15.5
100-N-93	J1D494	1/20/2011 10:50	FS-2	148442	570662	5.62		2.16	14.3		1.08	17600		21.6
100-N-93	J1D495	1/20/2011 12:25	FS-3	148478	570691	6.43		1.91	31.6		0.95	16900		19.1
100-N-93	J1D496	1/20/2011 12:30	FS-4	148486	570711	23.6		5.88	2890		2.94	122000		58.8
100-N-93	J1D497	1/20/2011 12:35	FS-5	148470	570696	2.24		1.31	6.08		0.66	8090		13.1
100-N-93	J1D498	1/20/2011 12:40	TT-1	148470	570691	22.2		7.13	3460		3.56	157000		71.3
100-N-93	J1D499	1/20/2011 12:35	Duplicate of J1D497	148470	570696	1.19	B	2.07	3.73		1.04	4740		20.7
100-N-93	J1D4B0	1/24/2011 9:00	TP-1	148500	570711	4.71		1.86	28.1		0.93	18700		18.6
100-N-93	J1D4B1	1/24/2011 9:25	TP-2	148486	570711	7.28		2	13.7		1	21300		20
100-N-93	J1D4C3	1/20/2011 12:27	FS-3	148478	570691	6.93		1.54	161		0.77	49800		76.9

Table B-1. Confirmatory Sampling Results. (5 Pages)

Site Code	Sample Number	Sample Date/Time	Sample Area	Northing	Easting	Lead			Magnesium			Manganese		
						mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
100-N-93	J1D492	1/20/2011 10:30	Equipment blank	NA	NA	0.654		0.33	24.9	B	48.7	6.7		3.25
100-N-93	J1D493	1/20/2011 10:40	FS-1	148433	570669	13.9		0.39	3440		58	231		3.87
100-N-93	J1D494	1/20/2011 10:50	FS-2	148442	570662	18.6		0.54	4080		81.1	278		5.41
100-N-93	J1D495	1/20/2011 12:25	FS-3	148478	570691	77.1		0.48	5880		71.5	427		4.76
100-N-93	J1D496	1/20/2011 12:30	FS-4	148486	570711	34600		5.88	5870		220	1140		14.7
100-N-93	J1D497	1/20/2011 12:35	FS-5	148470	570696	68.7		0.33	701		49.3	146		3.29
100-N-93	J1D498	1/20/2011 12:40	TT-1	148470	570691	1000		1.78	28700		267	1470		17.8
100-N-93	J1D499	1/20/2011 12:35	Duplicate of J1D497	148470	570696	19.5		0.52	580		77.7	120		5.18
100-N-93	J1D4B0	1/24/2011 9:00	TP-1	148500	570711	18.1		0.47	4930		69.9	184		4.66
100-N-93	J1D4B1	1/24/2011 9:25	TP-2	148486	570711	6.02		0.5	5630		74.9	346		4.99
100-N-93	J1D4C3	1/20/2011 12:27	FS-3	148478	570691	48.7		0.39	40200		288	294		3.85

Site Code	Sample Number	Sample Date/Time	Sample Area	Northing	Easting	Mercury			Molybdenum			Nickel		
						mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
100-N-93	J1D492	1/20/2011 10:30	Equipment blank	NA	NA	0.024	U	0.02	1.3	U	1.3	2.6	U	2.6
100-N-93	J1D493	1/20/2011 10:40	FS-1	148433	570669	0.03	U	0.03	0.262	B	1.55	10.9		3.09
100-N-93	J1D494	1/20/2011 10:50	FS-2	148442	570662	0.026	U	0.03	0.416	B	2.16	9.44		4.32
100-N-93	J1D495	1/20/2011 12:25	FS-3	148478	570691	0.012	B	0.03	0.526	B	1.91	8.34		3.81
100-N-93	J1D496	1/20/2011 12:30	FS-4	148486	570711	3.23		0.17	29.7		5.88	131		11.8
100-N-93	J1D497	1/20/2011 12:35	FS-5	148470	570696	0.024	U	0.02	2.04		1.31	2.36	B	2.63
100-N-93	J1D498	1/20/2011 12:40	TT-1	148470	570691	0.171		0.03	30.5		7.13	209		14.3
100-N-93	J1D499	1/20/2011 12:35	Duplicate of J1D497	148470	570696	0.025	U	0.03	0.993	B	2.07	2.9	B	4.15
100-N-93	J1D4B0	1/24/2011 9:00	TP-1	148500	570711	0.03	U	0.03	0.339	B	1.86	12.4		3.73
100-N-93	J1D4B1	1/24/2011 9:25	TP-2	148486	570711	0.029	U	0.03	0.348	B	2	13.8		4
100-N-93	J1D4C3	1/20/2011 12:27	FS-3	148478	570691	0.018	B	0.03	8.37		1.54	58.4		3.08

Site Code	Sample Number	Sample Date/Time	Sample Area	Northing	Easting	Potassium			Selenium			Silicon		
						mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
100-N-93	J1D492	1/20/2011 10:30	Equipment blank	NA	NA	44.4	B	260	0.195	U	0.2	176		1.3
100-N-93	J1D493	1/20/2011 10:40	FS-1	148433	570669	1080		309	0.232	U	0.23	484		1.55
100-N-93	J1D494	1/20/2011 10:50	FS-2	148442	570662	916		432	0.324	U	0.32	504		2.16
100-N-93	J1D495	1/20/2011 12:25	FS-3	148478	570691	817		381	0.286	U	0.29	423		1.91
100-N-93	J1D496	1/20/2011 12:30	FS-4	148486	570711	1360		1180	0.882	U	0.88	856		5.88
100-N-93	J1D497	1/20/2011 12:35	FS-5	148470	570696	191	B	263	0.197	U	0.2	364		1.31
100-N-93	J1D498	1/20/2011 12:40	TT-1	148470	570691	1510		1430	1.07	U	1.07	1230		7.13
100-N-93	J1D499	1/20/2011 12:35	Duplicate of J1D497	148470	570696	155	B	415	0.311	U	0.31	514		2.07
100-N-93	J1D4B0	1/24/2011 9:00	TP-1	148500	570711	2210		373	0.28	U	0.28	657		1.86
100-N-93	J1D4B1	1/24/2011 9:25	TP-2	148486	570711	1840		400	0.3	U	0.3	621		2
100-N-93	J1D4C3	1/20/2011 12:27	FS-3	148478	570691	426		308	0.231	U	0.23	677		1.54

Site Code	Sample Number	Sample Date/Time	Sample Area	Northing	Easting	Silver			Sodium			Vanadium		
						mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
100-N-93	J1D492	1/20/2011 10:30	Equipment blank	NA	NA	0.13	U	0.13	6.98	B	32.5	0.391	B	1.62
100-N-93	J1D493	1/20/2011 10:40	FS-1	148433	570669	0.155	U	0.16	195		38.7	44.4		1.93
100-N-93	J1D494	1/20/2011 10:50	FS-2	148442	570662	0.631		0.22	241		54.1	49.2		2.7
100-N-93	J1D495	1/20/2011 12:25	FS-3	148478	570691	0.191	U	0.19	324		47.6	45.4		2.38
100-N-93	J1D496	1/20/2011 12:30	FS-4	148486	570711	7.67		0.59	750		147	32.3		7.35
100-N-93	J1D497	1/20/2011 12:35	FS-5	148470	570696	0.131	U	0.13	47.9		32.9	8.75		1.64
100-N-93	J1D498	1/20/2011 12:40	TT-1	148470	570691	4.73		0.71	3160		178	49.5		8.91
100-N-93	J1D499	1/20/2011 12:35	Duplicate of J1D497	148470	570696	0.207	U	0.21	38.9	B	51.8	4.88		2.59
100-N-93	J1D4B0	1/24/2011 9:00	TP-1	148500	570711	0.186	U	0.19	542		46.6	40.8		2.33
100-N-93	J1D4B1	1/24/2011 9:25	TP-2	148486	570711	0.2	U	0.2	408		49.9	49.1		2.5
100-N-93	J1D4C3	1/20/2011 12:27	FS-3	148478	570691	0.513		0.15	178		38.5	16.9		1.92

Table B-1. Confirmatory Sampling Results. (5 Pages)

Site Code	Sample Number	Sample Date/Time	Sample Area	Northing	Easting	Zinc		
						mg/kg	Q	PQL
100-N-93	J1D492	1/20/2011 10:30	Equipment blank	NA	NA	1.55	B	6.49
100-N-93	J1D493	1/20/2011 10:40	FS-1	148433	570669	39.6		7.73
100-N-93	J1D494	1/20/2011 10:50	FS-2	148442	570662	51.8		10.8
100-N-93	J1D495	1/20/2011 12:25	FS-3	148478	570691	242		9.53
100-N-93	J1D496	1/20/2011 12:30	FS-4	148486	570711	2570		29.4
100-N-93	J1D497	1/20/2011 12:35	FS-5	148470	570696	76.5		6.57
100-N-93	J1D498	1/20/2011 12:40	TT-1	148470	570691	12600		143
100-N-93	J1D499	1/20/2011 12:35	Duplicate of J1D497	148470	570696	52.2		10.4
100-N-93	J1D4B0	1/24/2011 9:00	TP-1	148500	570711	69.8		9.32
100-N-93	J1D4B1	1/24/2011 9:25	TP-2	148486	570711	46.9		9.99
100-N-93	J1D4C3	1/20/2011 12:27	FS-3	148478	570691	162		7.69

Site Code	Sample Number	Sample Date/Time	Sample Area	Northing	Easting	TPH - Diesel Range			TPH - Motor Oil (high boiling)		
						ug/kg	Q	PQL	ug/kg	Q	PQL
100-N-93	J1D492	1/20/2011 10:30	Equipment blank	NA	NA						
100-N-93	J1D493	1/20/2011 10:40	FS-1	148433	570669						
100-N-93	J1D494	1/20/2011 10:50	FS-2	148442	570662	1340000		917000	3230000		2750000
100-N-93	J1D495	1/20/2011 12:25	FS-3	148478	570691						
100-N-93	J1D496	1/20/2011 12:30	FS-4	148486	570711						
100-N-93	J1D497	1/20/2011 12:35	FS-5	148470	570696						
100-N-93	J1D498	1/20/2011 12:40	TT-1	148470	570691						
100-N-93	J1D499	1/20/2011 12:35	Duplicate of J1D497	148470	570696						
100-N-93	J1D4B0	1/24/2011 9:00	TP-1	148500	570711						
100-N-93	J1D4B1	1/24/2011 9:25	TP-2	148486	570711						
100-N-93	J1D4C3	1/20/2011 12:27	FS-3	148478	570691						

Table B-1. 100-N-93 Confirmatory Sampling Results. (5 Pages)

SAMPLE NUMBER		J1D494			J1D497			J1D498			J1D499		
CONSTITUENT	CLASS	01/20/11 10:50 AM			01/20/11 12:35			01/20/11 12:40			01/20/11 12:35		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	564000	D	7120									
Acenaphthylene	PAH	7120	U	7120									
Anthracene	PAH	300000	D	7120									
Benzo(a)anthracene	PAH	240000	D	7120									
Benzo(a)pyrene	PAH	140000	D	7120									
Benzo(b)fluoranthene	PAH	146000	D	7120									
Benzo(ghi)perylene	PAH	52300	D	7120									
Benzo(k)fluoranthene	PAH	69100	D	7120									
Chrysene	PAH	122000	D	7120									
Dibenz[a,h]anthracene	PAH	21300	D	7120									
Fluoranthene	PAH	1090000	D	7120									
Fluorene	PAH	183000	D	7120									
Indeno(1,2,3-cd)pyrene	PAH	39500	D	7120									
Naphthalene	PAH	201000	D	7120									
Phenanthrene	PAH	1080000	D	7120									
Pyrene	PAH	1110000	D	7120									
Aroclor-1016	PCB	13.7	U	13.7	13.6	U	13.6	63.2	JD	72.6	13.6	U	13.6
Aroclor-1221	PCB	13.7	U	13.7	13.6	U	13.6	72.6	UD	72.6	13.6	U	13.6
Aroclor-1232	PCB	13.7	U	13.7	13.6	U	13.6	72.6	UD	72.6	13.6	U	13.6
Aroclor-1242	PCB	13.7	U	13.7	13.6	U	13.6	72.6	UD	72.6	13.6	U	13.6
Aroclor-1248	PCB	13.7	U	13.7	13.6	U	13.6	72.6	UD	72.6	13.6	U	13.6
Aroclor-1254	PCB	16.5		13.7	13.6	U	13.6	722	D	72.6	38.1		13.6
Aroclor-1260	PCB	10.4	J	13.7	13.6	U	13.6	115	D	72.6	8.6	J	13.6
Aroclor-1262	PCB												
Aroclor-1268	PCB												
1,2,4-Trichlorobenzene	SVOA	3530	UD	3530									
1,2-Dichlorobenzene	SVOA	3530	UD	3530									
1,3-Dichlorobenzene	SVOA	3530	UD	3530									
1,4-Dichlorobenzene	SVOA	3530	UD	3530									
2,4,5-Trichlorophenol	SVOA	3530	UD	3530									
2,4,6-Trichlorophenol	SVOA	3530	UD	3530									
2,4-Dichlorophenol	SVOA	3530	UD	3530									
2,4-Dimethylphenol	SVOA	3530	UD	3530									
2,4-Dinitrophenol	SVOA	17700	UD	17700									
2,4-Dinitrotoluene	SVOA	3530	UD	3530									
2,6-Dinitrotoluene	SVOA	3530	UD	3530									
2-Chloronaphthalene	SVOA	3530	UD	3530									
2-Chlorophenol	SVOA	3530	UD	3530									
2-Methylnaphthalene	SVOA	692	JD	3530									
2-Methylphenol (cresol, o-)	SVOA	3530	UD	3530									
2-Nitroaniline	SVOA	17700	UD	17700									
2-Nitrophenol	SVOA	3530	UD	3530									
3,3'-Dichlorobenzidine	SVOA	7060	UD	7060									
3+4 Methylphenol (cresol, m+p)	SVOA	3530	UD	3530									
3-Nitroaniline	SVOA	17700	UD	17700									
4,6-Dinitro-2-methylphenol	SVOA	3530	UD	3530									
4-Bromophenylphenyl ether	SVOA	3530	UD	3530									
4-Chloro-3-methylphenol	SVOA	3530	UD	3530									
4-Chloroaniline	SVOA	3530	UD	3530									

Table B-1. 100-N-93 Confirmatory Sampling Results. (5 Pages)

SAMPLE NUMBER		J1D494			J1D497			J1D498			J1D499		
CONSTITUENT	CLASS	01/20/11 10:50 AM			01/20/11 12:35			01/20/11 12:40			01/20/11 12:35		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
4-Chlorophenylphenyl ether	SVOA	3530	UD	3530									
4-Nitroaniline	SVOA	17700	UD	17700									
4-Nitrophenol	SVOA	17700	UD	17700									
Acenaphthene	SVOA	3150	JD	3530									
Acenaphthylene	SVOA	3530	UD	3530									
Anthracene	SVOA	5820	D	3530									
Benzo(a)anthracene	SVOA	15800	D	3530									
Benzo(a)pyrene	SVOA	17300	D	3530									
Benzo(b)fluoranthene	SVOA	18400	D	3530									
Benzo(ghi)perylene	SVOA	8280	D	3530									
Benzo(k)fluoranthene	SVOA	13300	D	3530									
Bis(2-chloro-1-methylethyl)ether	SVOA	3530	UD	3530									
Bis(2-Chloroethoxy)methane	SVOA	3530	UD	3530									
Bis(2-chloroethyl) ether	SVOA	3530	UD	3530									
Bis(2-ethylhexyl) phthalate	SVOA	3530	UD	3530									
Butylbenzylphthalate	SVOA	3530	UD	3530									
Carbazole	SVOA	4360	D	3530									
Chrysene	SVOA	20100	D	3530									
Dibenz[a,h]anthracene	SVOA	4470	D	3530									
Dibenzofuran	SVOA	1340	JD	3530									
Diethyl phthalate	SVOA	3530	UD	3530									
Dimethyl phthalate	SVOA	3530	UD	3530									
Di-n-butylphthalate	SVOA	3530	UD	3530									
Di-n-octylphthalate	SVOA	3530	UD	3530									
Fluoranthene	SVOA	34500	D	7060									
Fluorene	SVOA	2430	JD	3530									
Hexachlorobenzene	SVOA	3530	UD	3530									
Hexachlorobutadiene	SVOA	3530	UD	3530									
Hexachlorocyclopentadiene	SVOA	3530	UD	3530									
Hexachloroethane	SVOA	3530	UD	3530									
Indeno(1,2,3-cd)pyrene	SVOA	8500	D	3530									
Isophorone	SVOA	3530	UD	3530									
Naphthalene	SVOA	3530	UD	3530									
Nitrobenzene	SVOA	3530	UD	3530									
N-Nitroso-di-n-dipropylamine	SVOA	3530	UD	3530									
N-Nitrosodiphenylamine	SVOA	3530	UD	3530									
Pentachlorophenol	SVOA	17700	UD	17700									
Phenanthrene	SVOA	30400	D	7060									
Phenol	SVOA	3530	UD	3530									
Pyrene	SVOA	36600	D	7060									

Table B-2. 100-N-93 Waste Characterization Sampling Results. (3 Pages)

Sample Number	Sample Date/Time	Northing	Easting	Aluminum			Antimony			Arsenic			Barium		
				mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
J1R5X4	11/20/2012 8:24	148453.6	570685.6	5520		27.6	3.31	U	3.31	2.07	B	5.52	143		2.76
J1R5X5	11/20/2012 8:29	148477.4	570691.8	5240		13.7	17.2		1.65	2.06	B	2.75	83.6		1.37
J1R5X6	11/20/2012 8:33	148487.8	570712.6	7680		13.7	8.18		1.64	5.32		2.74	109		1.37
J1R5X7	11/20/2012 8:37	148465.2	570714.7	9090		16.8	7.62		2.02	4.74		3.36	182		1.68

Sample Number	Sample Date/Time	Northing	Easting	Beryllium			Boron			Cadmium			Calcium		
				mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
J1R5X4	11/20/2012 8:24	148453.6	570685.6	1.1	U	1.1	4.87	B	11	1.65		1.1	15200		552
J1R5X5	11/20/2012 8:29	148477.4	570691.8	0.208	B	0.55	6.57		5.49	3.21		0.55	35900		275
J1R5X6	11/20/2012 8:33	148487.8	570712.6	0.268	B	0.55	5.5		5.48	1.96		0.55	15200		274
J1R5X7	11/20/2012 8:37	148465.2	570714.7	0.318	B	0.67	6.42	B	6.72	27.1		0.67	16300		336

Sample Number	Sample Date/Time	Northing	Easting	Chromium			Cobalt			Copper			Iron		
				mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
J1R5X4	11/20/2012 8:24	148453.6	570685.6	11.5		1.1	11	U	11	33.4		5.52	15000		110
J1R5X5	11/20/2012 8:29	148477.4	570691.8	10.3		0.55	7.97		5.49	64.5		2.75	23500		54.9
J1R5X6	11/20/2012 8:33	148487.8	570712.6	42.2		0.55	8.36		5.48	6630		2.74	23000		54.8
J1R5X7	11/20/2012 8:37	148465.2	570714.7	28.7		0.67	9.83		6.72	83.1		3.36	42000		67.2

Sample Number	Sample Date/Time	Northing	Easting	Lead			Magnesium			Manganese			Mercury		
				mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
J1R5X4	11/20/2012 8:24	148453.6	570685.6	49		2.76	3420		414	266		27.6	0.0362	B	0.05
J1R5X5	11/20/2012 8:29	148477.4	570691.8	88.2		1.37	15900		206	286		13.7	0.236		0.03
J1R5X6	11/20/2012 8:33	148487.8	570712.6	752		1.37	4590		205	372		13.7	0.115		0.03
J1R5X7	11/20/2012 8:37	148465.2	570714.7	216		1.68	4970		252	483		16.8	4.62		0.17

Sample Number	Sample Date/Time	Northing	Easting	Molybdenum			Nickel			Potassium			Selenium		
				mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
J1R5X4	11/20/2012 8:24	148453.6	570685.6	4.2	B	11	13.9	B	22.1	1580	B	2210	1.66	U	1.66
J1R5X5	11/20/2012 8:29	148477.4	570691.8	0.584	B	5.49	11.5		11	832	B	1100	0.824	U	0.82
J1R5X6	11/20/2012 8:33	148487.8	570712.6	5.08	B	5.48	69.2		11	1710		1100	0.822	U	0.82
J1R5X7	11/20/2012 8:37	148465.2	570714.7	2.34	B	6.72	25.9		13.4	1470		1340	1.01	U	1.01

Sample Number	Sample Date/Time	Northing	Easting	Silicon			Silver			Sodium			Vanadium		
				mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
J1R5X4	11/20/2012 8:24	148453.6	570685.6	558		11	1.1	U	1.1	193	B	276	40		13.8
J1R5X5	11/20/2012 8:29	148477.4	570691.8	259		5.49	0.607		0.55	432		137	58.8		6.87
J1R5X6	11/20/2012 8:33	148487.8	570712.6	366		5.48	1.68		0.55	593		137	47.4		6.85
J1R5X7	11/20/2012 8:37	148465.2	570714.7	536		6.72	2.64		0.67	1040		168	48.5		8.41

Sample Number	Sample Date/Time	Northing	Easting	Zinc		
				mg/kg	Q	PQL
J1R5X4	11/20/2012 8:24	148453.6	570685.6	126		55.2
J1R5X5	11/20/2012 8:29	148477.4	570691.8	479		27.5
J1R5X6	11/20/2012 8:33	148487.8	570712.6	777		27.4
J1R5X7	11/20/2012 8:37	148465.2	570714.7	1250		33.6

Table B-2. 100-N-93 Waste Characterization Sampling Results. (3 Pages)

	Sample Number	J1R5X4			J1R5X5			J1R5X6			J1R5X7		
	Location	100-N-93			100-N-93			100-N-93			100-N-93		
Constituent	Class	11/20/12 08:24 AM			11/20/12 08:29			11/20/12 08:33			11/20/12 08:37		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	646	UD	646	38.9	UD	38.9	134	JD	183	38.9	UD	38.9
Acenaphthylene	PAH	646	UD	646	38.9	UD	38.9	225	D	183	38.9	UD	38.9
Anthracene	PAH	646	UD	646	14.4	JD	38.9	183	UD	183	38.9	UD	38.9
Benzo(a)anthracene	PAH	646	UD	646	179	D	38.9	83.5	JD	183	38.5	JD	38.9
Benzo(a)pyrene	PAH	646	UD	646	38.9	UD	38.9	66.4	JD	183	45.7	D	38.9
Benzo(b)fluoranthene	PAH	646	UD	646	219	D	38.9	183	UD	183	26.3	JD	38.9
Benzo(ghi)perylene	PAH	646	UD	646	413	D	38.9	183	UD	183	54.5	D	38.9
Benzo(k)fluoranthene	PAH	646	UD	646	129	D	38.9	183	UD	183	16.1	JD	38.9
Chrysene	PAH	646	UD	646	165	D	38.9	183	UD	183	29.8	JD	38.9
Dibenz[a,h]anthracene	PAH	646	UD	646	51.4	D	38.9	183	UD	183	10.3	JD	38.9
Fluoranthene	PAH	646	UD	646	400	D	38.9	107	JD	183	73.9	D	38.9
Fluorene	PAH	646	UD	646	38.9	UD	38.9	183	UD	183	38.9	UD	38.9
Indeno(1,2,3-cd)pyrene	PAH	273	JD	646	188	D	38.9	183	UD	183	31.9	JD	38.9
Naphthalene	PAH	646	UD	646	271	D	38.9	144	JD	183	76.2	D	38.9
Phenanthrene	PAH	646	UD	646	122	D	38.9	65.9	JD	183	17.9	JD	38.9
Pyrene	PAH	646	UD	646	195	D	38.9	183	UD	183	43	D	38.9
Aroclor-1016	PCB	54.9	UD	54.9	152	UD	152	300	UD	300	15.8	U	15.8
Aroclor-1221	PCB	54.9	UD	54.9	152	UD	152	300	UD	300	15.8	U	15.8
Aroclor-1232	PCB	54.9	UD	54.9	152	UD	152	300	UD	300	15.8	U	15.8
Aroclor-1242	PCB	33.4	JD	54.9	152	UD	152	300	UD	300	18.5		15.8
Aroclor-1248	PCB	54.9	UD	54.9	152	UD	152	300	UD	300	15.8	U	15.8
Aroclor-1254	PCB	407	D	54.9	700	D	152	3570	D	300	43.5		15.8
Aroclor-1260	PCB	44.4	JD	54.9	131	JD	152	439	D	300	6.93	J	15.8
Aroclor-1262	PCB	54.9	UD	54.9	152	UD	152	300	UD	300	15.8	U	15.8
Aroclor-1268	PCB	54.9	UD	54.9	152	UD	152	300	UD	300	15.8	U	15.8
1,2,4-Trichlorobenzene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
1,2-Dichlorobenzene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
1,3-Dichlorobenzene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
1,4-Dichlorobenzene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
2,4,5-Trichlorophenol	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
2,4,6-Trichlorophenol	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
2,4-Dichlorophenol	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
2,4-Dimethylphenol	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
2,4-Dinitrophenol	SVOA	129000	UD	129000	22600	UD	22600	22400	UD	22400	11700	UD	11700
2,4-Dinitrotoluene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
2,6-Dinitrotoluene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
2-Chloronaphthalene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
2-Chlorophenol	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
2-Methylnaphthalene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
2-Methylphenol (cresol, o-)	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
2-Nitroaniline	SVOA	129000	UD	129000	22600	UD	22600	22400	UD	22400	11700	UD	11700
2-Nitrophenol	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
3,3'-Dichlorobenzidine	SVOA	51700	UD	51700	9040	UD	9040	8950	UD	8950	4690	UD	4690
3+4 Methylphenol (cresol, m+p)	SVOA	25900	UD	25900	4520	UD	4520	2390	JD	4470	2350	UD	2350
3-Nitroaniline	SVOA	129000	UD	129000	22600	UD	22600	22400	UD	22400	11700	UD	11700
4,6-Dinitro-2-methylphenol	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
4-Bromophenylphenyl ether	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
4-Chloro-3-methylphenol	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
4-Chloroaniline	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350

Table B-2. 100-N-93 Waste Characterization Sampling Results. (3 Pages)

Sample Number		J1R5X4			J1R5X5			J1R5X6			J1R5X7		
Location		100-N-93			100-N-93			100-N-93			100-N-93		
Constituent	Class	11/20/12 08:24 AM			11/20/12 08:29			11/20/12 08:33			11/20/12 08:37		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
4-Chlorophenylphenyl ether	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
4-Nitroaniline	SVOA	129000	UD	129000	22600	UD	22600	22400	UD	22400	11700	UD	11700
4-Nitrophenol	SVOA	129000	UD	129000	22600	UD	22600	22400	UD	22400	11700	UD	11700
Acenaphthene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Acenaphthylene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Anthracene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Benzo(a)anthracene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Benzo(a)pyrene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Benzo(b)fluoranthene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Benzo(ghi)perylene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Benzo(k)fluoranthene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Bis(2-chloro-1-methylethyl)ether	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Bis(2-Chloroethoxy)methane	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Bis(2-chloroethyl) ether	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Bis(2-ethylhexyl) phthalate	SVOA	67000	D	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Butylbenzylphthalate	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Carbazole	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Chrysene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Dibenz[a,h]anthracene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Dibenzofuran	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Diethyl phthalate	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Dimethyl phthalate	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Di-n-butylphthalate	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Di-n-octylphthalate	SVOA	19600	DJ	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Fluoranthene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Fluorene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Hexachlorobenzene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Hexachlorobutadiene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Hexachlorocyclopentadiene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Hexachloroethane	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Indeno(1,2,3-cd)pyrene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Isophorone	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Naphthalene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Nitrobenzene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
N-Nitroso-di-n-dipropylamine	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
N-Nitrosodiphenylamine	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Pentachlorophenol	SVOA	129000	UD	129000	22600	UD	22600	22400	UD	22400	11700	UD	11700
Phenanthrene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Phenol	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350
Pyrene	SVOA	25900	UD	25900	4520	UD	4520	4470	UD	4470	2350	UD	2350

Table B-3. 100-N-93 In-Process Sampling Results. (16 Pages)

Sample Number	Sample Date/Time	Northing	Easting	Aluminum			Antimony			Arsenic			Barium			Beryllium		
				mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
J1RJR8	3/28/2013 10:28	148465.6	570689	16400		1.7	11.8		0.41	10.9		0.71	255		0.082	0.35		0.036
J1RJR9	3/28/2013 10:35	148468	570689.6	7770		1.6	0.39	U	0.39	5.2		0.68	114		0.079	0.27		0.034
J1RJT0	3/28/2013 10:39			8010		1.6	0.4	U	0.4	6.6		0.69	163		0.08	0.29		0.035
J1RP74	6/17/2013 12:05	148495.5	570724.7	8070	X	1.4	0.84	M	0.33	3.3		0.58	72	X	0.067	0.22		0.029
J1RP75	6/17/2013 12:10	148450.6	570730.9	8830	X	1.3	0.41	B	0.33	3.7		0.57	61.7	X	0.066	0.26		0.029
J1RP76	6/17/2013 12:20	148431.2	570692.4	4630	X	1.6	0.97		0.38	2		0.66	46.2	X	0.076	0.088	B	0.033
J1RP77	6/17/2013 12:25	148430.4	570652.9	5310	X	1.4	0.62		0.35	1.7		0.6	49.8	X	0.069	0.12	B	0.03
J1RP78	6/17/2013 12:30	148446.7	570649.9	7630	X	1.5	0.37	B	0.37	4.6		0.64	87.9	X	0.073	0.21		0.032
J1T0V8	9/10/2013 14:20	148435.8	570701.6	5440	X	1.6	0.38	U	0.38	2.7		0.66	52.1	X	0.076	0.3		0.033
J1T0V9	9/10/2013 14:25	148440.9	570657.6	5050	X	1.3	0.32	U	0.32	1.9		0.56	50.5	X	0.065	0.28		0.028
J1T0W0	9/10/2013 14:30	148452.6	570664.6	6490	X	1.5	0.36	U	0.36	3.1		0.63	53.9	X	0.073	0.24		0.032
J1T0W1	9/10/2013 14:35	148456.9	570672	6220	X	1.5	0.37	U	0.37	2.8		0.64	58	X	0.073	0.25		0.032
J1T0W2	9/10/2013 14:40	148441.4	570679.9	6450	X	1.5	0.36	U	0.36	3		0.62	59.4	X	0.071	0.32		0.031
J1T4N9	10/30/2013 13:30	148501.4	570710.5	9670		1.6	0.4	U	0.4	4		0.7	79.3		0.081	0.26		0.035
J1T4P0	10/30/2013 13:35	148480.8	570721.1	6780		1.4	0.34	U	0.34	3.1		0.58	57.4		0.067	0.16	B	0.029
J1T4P1	10/30/2013 13:40	148460.9	570739.8	9370		1.5	0.37	U	0.37	4.2		0.65	84.4		0.075	0.29		0.032
J1T4P2	10/30/2013 13:45	148443.7	570717.6	6160		1.4	0.34	U	0.34	2.6		0.59	58.6		0.068	0.15	B	0.029
J1T4P3	10/30/2013 13:50	148464.2	570709.1	4690		1.6	0.39	U	0.39	2.2		0.67	41.2		0.077	0.11	B	0.034
J1T4P4	10/30/2013 13:55	148483.5	570700.2	5780		1.5	0.37	U	0.37	2.3		0.65	34		0.074	0.12	B	0.032
J1T4P5	10/30/2013 14:00	148480.9	570683.9	6090		1.3	0.33	U	0.33	2.8		0.57	48		0.066	0.13	B	0.028
J1T4P6	10/30/2013 14:05	148461.9	570696.2	6650		1.4	0.35	U	0.35	3.6		0.61	62.1		0.07	0.15	B	0.03
J1T4P7	10/30/2013 14:10	148459.6	570686.1	6480		1.4	0.34	U	0.34	2.6		0.58	49.1		0.067	0.12	B	0.029
J1T4P8	10/30/2013 14:15	148447	570702.1	5380		1.3	0.33	U	0.33	1.8		0.57	49.9		0.066	0.1	B	0.029
J1T646	11/19/2013 11:55	148447.8	570650.8	6410		1.4	0.34	U	0.34	3.2		0.58	69.2		0.067	0.029	U	0.029
J1T647	11/19/2013 12:00	148454.7	570657.1	6380		1.4	6		0.34	3.4		0.59	95.4		0.067	0.029	U	0.029
J1T648	11/19/2013 12:05	148471.3	570670.5	5660		1.4	4		0.34	2.6		0.59	135		0.068	0.03		0.03
J1T649	11/19/2013 12:10	148440.9	570679.3	5190		1.4	0.35	U	0.35	2.3		0.61	56.2		0.07	0.15	U	0.15
J1T650	11/19/2013 12:15	148424.7	570679.2	8260		1.6	0.39	U	0.39	3.8		0.67	67.9		0.078	0.034	U	0.034
J1T651	11/19/2013 12:20	148428.6	570662.9	4780		1.5	0.37	U	0.37	1.9		0.64	38.7		0.074	0.16	U	0.16
J1T666	11/19/2013 12:25	148470.9	570653.6	4940		1.5	0.36	U	0.36	2.4		0.63	49.5		0.073	0.032	U	0.032
J1T667	11/19/2013 12:30	148487.9	570660.9	5160		1.5	0.36	U	0.36	2		0.63	43.4		0.072	0.031	U	0.031

Sample Number	Sample Date/Time	Northing	Easting	Boron			Cadmium			Calcium			Chromium			Cobalt		
				mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
J1RJR8	3/28/2013 10:28	148465.6	570689	31.8		1.1	7.7		0.044	44800		15.3	71.7		0.063	13.8	X	0.11
J1RJR9	3/28/2013 10:35	148468	570689.6	6.7		1	1.6		0.042	23100		14.6	34.1		0.06	8.1	X	0.1
J1RJT0	3/28/2013 10:39			15.8	M	1	2.1		0.043	24100		14.8	35.9	N	0.061	8.4	X	0.1
J1RP74	6/17/2013 12:05	148495.5	570724.7	1.3	BM	0.86	0.21		0.036	6350	XMN	12.3	14	X	0.051	8.2	X	0.088
J1RP75	6/17/2013 12:10	148450.6	570730.9	0.85	U	0.85	0.15	B	0.036	5780	X	12.3	10.1	X	0.05	10.6	X	0.087
J1RP76	6/17/2013 12:20	148431.2	570692.4	0.98	U	0.98	0.13	B	0.041	4480	X	14.2	3.9	X	0.058	10.4	X	0.1
J1RP77	6/17/2013 12:25	148430.4	570652.9	0.89	U	0.89	0.12	B	0.037	4950	X	12.9	5.2	X	0.053	10.4	X	0.091
J1RP78	6/17/2013 12:30	148446.7	570649.9	1.8	B	0.95	0.36		0.04	15400	X	13.6	69.5	X	0.056	7.5	X	0.096
J1T0V8	9/10/2013 14:20	148435.8	570701.6	0.98	U	0.98	0.27		0.041	7810	X	14.1	6.7	X	0.058	8.4	X	0.1
J1T0V9	9/10/2013 14:25	148440.9	570657.6	0.84	U	0.84	0.19		0.035	5500	X	12	4.9	X	0.05	8.6	X	0.085
J1T0W0	9/10/2013 14:30	148452.6	570664.6	0.94	U	0.94	0.28		0.039	7830	X	13.5	12.9	X	0.055	7.3	X	0.096
J1T0W1	9/10/2013 14:35	148456.9	570672	1.4	B	0.94	0.3		0.039	7700	X	13.6	11.2	X	0.056	6.5	X	0.096
J1T0W2	9/10/2013 14:40	148441.4	570679.9	0.92	U	0.92	0.26		0.038	7630	X	13.2	9.7	X	0.054	8.9	X	0.094
J1T4N9	10/30/2013 13:30	148501.4	570710.5	2.4		1	0.1	B	0.043	7430		14.9	14.2		0.061	8.5	X	0.11
J1T4P0	10/30/2013 13:35	148480.8	570721.1	1.1	B	0.87	0.08	B	0.036	4520		12.5	7.7		0.051	8.7	X	0.088
J1T4P1	10/30/2013 13:40	148460.9	570739.8	1.1	B	0.96	0.11	B	0.04	4770		13.9	10.8		0.057	9.3	X	0.098
J1T4P2	10/30/2013 13:45	148443.7	570717.6	0.87	U	0.87	0.079	B	0.037	6290		12.6	6.7		0.052	8.1	X	0.089
J1T4P3	10/30/2013 13:50	148464.2	570709.1	1	U	1	0.07	B	0.042	5240		14.3	7.1		0.059	6	X	0.1
J1T4P4	10/30/2013 13:55	148483.5	570700.2	0.96	U	0.96	0.069	B	0.04	6790		13.8	9		0.057	5.1	X	0.098
J1T4P5	10/30/2013 14:00	148480.9	570683.9	1.2	B	0.85	0.081	B	0.035	7830		12.2	10.1		0.05	5.4	X	0.086
J1T4P6	10/30/2013 14:05	148461.9	570696.2	0.9	U	0.9	0.12	B	0.038	8790		13	13.1		0.053	5.8	X	0.092
J1T4P7	10/30/2013 14:10	148459.6	570686.1	0.94	B	0.87	0.081	B	0.036	4960		12.4	12.3		0.051	6.8	X	0.088
J1T4P8	10/30/2013 14:15	148447	570702.1	0.85	U	0.85	0.073	B	0.036	5160		12.2	5		0.05	7.5	X	0.087
J1T646	11/19/2013 11:55	148447.8	570650.8	2.2		0.86	0.37		0.036	8670		12.4	17.2		0.051	18.8	NXM	0.088
J1T647	11/19/2013 12:00	148454.7	570657.1	3.3		0.87	0.87		0.036	9410		12.5	14.3		0.052	6.7	X	0.089
J1T648	11/19/2013 12:05	148471.3	570670.5	3.5		0.88	0.4		0.037	11500		12.6	12.3		0.052	6.5	X	0.09
J1T649	11/19/2013 12:10	148440.9	570679.3	0.9	U	0.9	0.23		0.038	5690		13	7.7		0.054	9.2	X	0.092
J1T650	11/19/2013 12:15	148424.7	570679.2	1.1	B	1	0.24		0.042	10500		14.4	15.9		0.059	7.1	X	0.1
J1T651	11/19/2013 12:20	148428.6	570662.9	0.95	U	0.95	0.093	B	0.04	4840		13.7	4.8		0.056	9.3	X	0.097
J1T666	11/19/2013 12:25	148470.9	570653.6	0.94	U	0.94	0.11	B	0.039	5700		13.5	7.3		0.056	6.4	X	0.096
J1T667	11/19/2013 12:30	148487.9	570660.9	0.93	U	0.93	0.11	B	0.039	4440		13.4	6.6		0.055	6.3	X	0.095

Table B-3. 100-N-93 In-Process Sampling Results. (16 Pages)

Sample Number	Sample Date/Time	Northing	Easting	Copper			Iron			Lead			Magnesium			Manganese		
				mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
J1RJR8	3/28/2013 10:28	148465.6	570689	781		0.24	91800		4.1	969	X	0.29	12500		4	1250		0.11
J1RJR9	3/28/2013 10:35	148468	570689.6	91.4		0.22	31900		3.9	175	X	0.28	7200		3.8	504		0.1
J1RJT0	3/28/2013 10:39			135	M	0.23	35200		4	317	X	0.28	6310		3.9	505		0.1
J1RP74	6/17/2013 12:05	148495.5	570724.7	20.1		0.19	21500	X	3.3	20.9	X	0.24	4940	X	3.2	412	X	0.088
J1RP75	6/17/2013 12:10	148450.6	570730.9	19.9		0.19	23900	X	3.3	6	X	0.23	5950	X	3.2	363	X	0.087
J1RP76	6/17/2013 12:20	148431.2	570692.4	14.5		0.22	25300	X	3.8	2.6	X	0.27	4490	X	3.7	339	X	0.1
J1RP77	6/17/2013 12:25	148430.4	570652.9	15.7		0.2	25100	X	3.5	2.9	X	0.25	4740	X	3.4	310	X	0.091
J1RP78	6/17/2013 12:30	148446.7	570649.9	42.6		0.21	21400	X	3.7	52.7	X	0.26	5990	X	3.6	402	X	0.096
J1T0V8	9/10/2013 14:20	148435.8	570701.6	141	XM	0.22	23700	X	3.8	15	X	0.27	4390	X	3.7	283	X	0.1
J1T0V9	9/10/2013 14:25	148440.9	570657.6	16.5	X	0.19	22700	X	3.2	5.6	X	0.23	3870	X	3.2	339	X	0.085
J1T0W0	9/10/2013 14:30	148452.6	570664.6	21.4	X	0.21	22000	X	3.6	7.1	X	0.26	4480	X	3.5	318	X	0.096
J1T0W1	9/10/2013 14:35	148456.9	570672	28.7	X	0.21	17200	X	3.7	14.2	X	0.26	4340	X	3.6	282	X	0.096
J1T0W2	9/10/2013 14:40	148441.4	570679.9	1250	X	0.2	23200	X	3.6	33.8	X	0.25	4910	X	3.5	331	X	0.094
J1T4N9	10/30/2013 13:30	148501.4	570710.5	22.6		0.23	19600		4	11.1		0.29	6060		3.9	316		0.11
J1T4P0	10/30/2013 13:35	148480.8	570721.1	17.1		0.19	20400		3.4	4.5		0.24	4850		3.3	309		0.088
J1T4P1	10/30/2013 13:40	148460.9	570739.8	20.6		0.21	22200		3.7	6.6		0.27	6140		3.6	377		0.098
J1T4P2	10/30/2013 13:45	148443.7	570717.6	17.9		0.19	19700		3.4	3.1		0.24	4160		3.3	264		0.089
J1T4P3	10/30/2013 13:50	148464.2	570709.1	14		0.22	15400		3.9	2.3		0.27	3710		3.8	210		0.1
J1T4P4	10/30/2013 13:55	148483.5	570700.2	12.7		0.21	13500		3.7	2.5		0.26	4250		3.6	238		0.098
J1T4P5	10/30/2013 14:00	148480.9	570683.9	18.7		0.19	14200		3.3	2.6		0.23	4590		3.2	262		0.086
J1T4P6	10/30/2013 14:05	148461.9	570696.2	17.1		0.2	13800		3.5	3.1		0.25	4860		3.4	277		0.092
J1T4P7	10/30/2013 14:10	148459.6	570686.1	16.7		0.19	17000		3.4	3.3		0.24	5060		3.3	259		0.088
J1T4P8	10/30/2013 14:15	148447	570702.1	18.2		0.19	18800		3.3	2.6		0.23	3670		3.2	220		0.087
J1T646	11/19/2013 11:55	148447.8	570650.8	93.2	NM	0.19	16600		3.4	23	M	0.24	4690		3.3	284		0.088
J1T647	11/19/2013 12:00	148454.7	570657.1	51.1		0.19	19900		3.4	125		0.24	5290		3.3	303		0.089
J1T648	11/19/2013 12:05	148471.3	570670.5	46.6		0.19	20900		3.4	32.3		0.24	4140		3.3	257		0.09
J1T649	11/19/2013 12:10	148440.9	570679.3	98.6		0.2	24800		3.5	9		0.25	4910		3.4	333		0.092
J1T650	11/19/2013 12:15	148424.7	570679.2	19.9		0.22	17400		3.9	11.3		0.28	5480		3.8	318		0.1
J1T651	11/19/2013 12:20	148428.6	570662.9	15.5		0.21	26100		3.7	3.5		0.26	4470		3.6	299		0.097
J1T666	11/19/2013 12:25	148470.9	570653.6	14.9		0.21	18000		3.6	3.8		0.26	4010		3.5	262		0.096
J1T667	11/19/2013 12:30	148487.9	570660.9	14.3		0.21	17600		3.6	3.3		0.26	3710		3.5	232		0.095

Sample Number	Sample Date/Time	Northing	Easting	Mercury			Molybdenum			Nickel			Potassium			Selenium		
				mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
J1RJR8	3/28/2013 10:28	148465.6	570689	0.19		0.0067	11.8		0.28	101	X	0.13	2000		44.4	0.93	U	0.93
J1RJR9	3/28/2013 10:35	148468	570689.6	0.081		0.0053	6.4		0.27	32.6	X	0.13	1690		42.4	0.89	U	0.89
J1RJT0	3/28/2013 10:39			0.58		0.0055	5.8	M	0.27	25.9	XM	0.13	1630		43	0.9	U	0.9
J1RP74	6/17/2013 12:05	148495.5	570724.7	0.0053	U	0.0053	1.2	BM	0.23	24.1	XM	0.11	1550		35.9	0.75	U	0.75
J1RP75	6/17/2013 12:10	148450.6	570730.9	0.0063	U	0.0063	0.23	U	0.23	13.3	X	0.11	1650		35.7	0.75	U	0.75
J1RP76	6/17/2013 12:20	148431.2	570692.4	0.006	U	0.006	0.26	U	0.26	7.8	X	0.12	730		41.1	0.86	U	0.86
J1RP77	6/17/2013 12:25	148430.4	570652.9	0.0055	U	0.0055	0.24	U	0.24	9.7	X	0.11	869		37.4	0.78	U	0.78
J1RP78	6/17/2013 12:30	148446.7	570649.9	0.016	B	0.0056	12.1		0.25	21.6	X	0.12	1250		39.6	0.83	U	0.83
J1T0V8	9/10/2013 14:20	148435.8	570701.6	0.0067	U	0.0067	0.44	BM	0.26	9.9	X	0.12	799		41.1	0.86	U	0.86
J1T0V9	9/10/2013 14:25	148440.9	570657.6	0.0055	U	0.0055	0.28	B	0.22	8.4	X	0.11	695		35	0.73	U	0.73
J1T0W0	9/10/2013 14:30	148452.6	570664.6	0.034		0.0061	0.35	B	0.25	13.1	X	0.12	961		39.2	0.82	U	0.82
J1T0W1	9/10/2013 14:35	148456.9	570672	0.027		0.0062	0.41	B	0.25	10.6	X	0.12	884		39.5	0.83	U	0.83
J1T0W2	9/10/2013 14:40	148441.4	570679.9	0.0063	U	0.0063	0.41	B	0.24	12.8	X	0.12	896		38.5	0.81	U	0.81
J1T4N9	10/30/2013 13:30	148501.4	570710.5	0.0077	B	0.006	0.31	B	0.28	16.4		0.13	1970		43.5	0.91	U	0.91
J1T4P0	10/30/2013 13:35	148480.8	570721.1	0.0048	U	0.0048	0.23	U	0.23	10.2		0.11	1260		36.2	0.76	U	0.76
J1T4P1	10/30/2013 13:40	148460.9	570739.8	0.0065	B	0.0058	0.26	U	0.26	13.3		0.12	1750		40.3	0.84	U	0.84
J1T4P2	10/30/2013 13:45	148443.7	570717.6	0.0065	U	0.0065	0.23	U	0.23	9.6		0.11	973		36.6	0.77	U	0.77
J1T4P3	10/30/2013 13:50	148464.2	570709.1	0.005	U	0.005	0.26	U	0.26	8.2		0.12	708		41.6	0.87	U	0.87
J1T4P4	10/30/2013 13:55	148483.5	570700.2	0.0051	U	0.0051	0.25	U	0.25	9.5		0.12	799		40.1	0.84	U	0.84
J1T4P5	10/30/2013 14:00	148480.9	570683.9	0.0055	U	0.0055	0.22	U	0.22	10.6		0.11	861		35.4	0.74	U	0.74
J1T4P6	10/30/2013 14:05	148461.9	570696.2	0.0058	U	0.0058	0.24	U	0.24	12.8		0.11	1030		37.7	0.79	U	0.79
J1T4P7	10/30/2013 14:10	148459.6	570686.1	0.006	U	0.006	0.23	U	0.23	14.8		0.11	933		36.2	0.76	U	0.76
J1T4P8	10/30/2013 14:15	148447	570702.1	0.0066	U	0.0066	0.23	U	0.23	8.2		0.11	713		35.6	0.75	U	0.75
J1T646	11/19/2013 11:55	148447.8	570650.8	0.26	N	0.0055	0.44	B	0.23	13.2	X	0.11	1010		36.2	0.76	U	0.76
J1T647	11/19/2013 12:00	148454.7	570657.1	0.022		0.0058	0.58	B	0.23	17.8	X	0.11	961		36.4	0.76	U	0.76
J1T648	11/19/2013 12:05	148471.3	570670.5	0.0061	B	0.0053	0.47	B	0.23	13.2	X	0.11	903		36.7	0.77	U	0.77
J1T649	11/19/2013 12:10	148440.9	570679.3	0.0051	U	0.0051	0.24	U	0.24	10.9	X	0.11	812		37.8	0.79	U	0.79
J1T650	11/19/2013 12:15	148424.7	570679.2	0.0063	B	0.0058	0.27	U	0.27	15.4	X	0.13	1440		41.9	0.88	U	0.88
J1T651	11/19/2013 12:20	148428.6	570662.9	0.0053	U	0.0053	0.25	U	0.25	9.1	X	0.12	746		39.9	0.84	U	0.84
J1T666	11/19/2013 12:25	148470.9	570653.6	0.005	U	0.005	0.25	U	0.25	9.3	X	0.12	663		39.2	0.82	U	0.82
J1T667	11/19/2013 12:30	148487.9	570660.9	0.0054	U	0.0054	0.25	U	0.25	8.5	X	0.12	727		39	0.82	U	0.82

Table B-3. 100-N-93 In-Process Sampling Results. (16 Pages)

Sample Number	Sample Date/Time	Northing	Easting	Silicon			Silver			Sodium			Vanadium			Zinc		
				mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
J1RJR8	3/28/2013 10:28	148465.6	570689	441		6.1	6.6		0.17	3210		63.9	41.4		0.1	3950		0.43
J1RJR9	3/28/2013 10:35	148468	570689.6	367		5.9	0.58		0.17	812		61	44.2		0.097	477		0.41
J1RJT0	3/28/2013 10:39			377	N	5.9	1.2		0.17	764		61.8	44.9		0.099	645	M	0.42
J1RP74	6/17/2013 12:05	148495.5	570724.7	340	XN	5	0.29		0.14	357		51.7	42.7	X	0.082	104	XN	0.35
J1RP75	6/17/2013 12:10	148450.6	570730.9	186	X	4.9	0.16	B	0.14	375		51.3	51	X	0.082	51.9	X	0.35
J1RP76	6/17/2013 12:20	148431.2	570692.4	176	X	5.7	0.16	U	0.16	265		59.2	64.5	X	0.094	45.2	X	0.4
J1RP77	6/17/2013 12:25	148430.4	570652.9	198	X	5.2	0.2		0.15	283		53.8	58.1	X	0.086	45.6	X	0.36
J1RP78	6/17/2013 12:30	148446.7	570649.9	248	X	5.5	0.26		0.15	260		56.9	37	X	0.091	66.7	X	0.38
J1T0V8	9/10/2013 14:20	148435.8	570701.6	255	N	5.7	0.16	U	0.16	372		59.1	56	X	0.094	64.2	X	0.4
J1T0V9	9/10/2013 14:25	148440.9	570657.6	187		4.8	0.14	U	0.14	278		50.4	59.4	X	0.08	42.4	X	0.34
J1T0W0	9/10/2013 14:30	148452.6	570664.6	226		5.4	0.15	U	0.15	211		56.4	40.9	X	0.09	36.6	X	0.38
J1T0W1	9/10/2013 14:35	148456.9	570672	223		5.4	0.15	U	0.15	283		56.8	44.6	X	0.09	54.2	X	0.38
J1T0W2	9/10/2013 14:40	148441.4	570679.9	263		5.3	0.15	U	0.15	309		55.4	57.5	X	0.088	71.7	X	0.37
J1T4N9	10/30/2013 13:30	148501.4	570710.5	282	N	6	0.17	U	0.17	2260		62.5	34.8		0.1	56.2	X	0.42
J1T4P0	10/30/2013 13:35	148480.8	570721.1	168	N	5	0.14	U	0.14	381		52.1	41.2		0.083	42.1	X	0.35
J1T4P1	10/30/2013 13:40	148460.9	570739.8	184	N	5.6	0.16	U	0.16	395		58	42.7		0.092	52.3	X	0.39
J1T4P2	10/30/2013 13:45	148443.7	570717.6	130	N	5.1	0.14	U	0.14	390		52.6	38.4		0.084	37.3	X	0.36
J1T4P3	10/30/2013 13:50	148464.2	570709.1	143	N	5.7	0.16	U	0.16	174		59.9	31.8		0.095	29.7	X	0.4
J1T4P4	10/30/2013 13:55	148483.5	570700.2	133	N	5.5	0.16	U	0.16	192		57.7	32.4		0.092	30.3	X	0.39
J1T4P5	10/30/2013 14:00	148480.9	570683.9	156	N	4.9	0.14	U	0.14	207		50.9	32.8		0.081	32.1	X	0.34
J1T4P6	10/30/2013 14:05	148461.9	570696.2	203	N	5.2	0.15	U	0.15	171		54.2	29.8		0.086	33.2	X	0.37
J1T4P7	10/30/2013 14:10	148459.6	570686.1	152	N	5	0.14	U	0.14	354		52.1	37.1		0.083	34.9	X	0.35
J1T4P8	10/30/2013 14:15	148447	570702.1	173	N	4.9	0.14	U	0.14	420		51.2	39		0.082	34.2	X	0.35
J1T646	11/19/2013 11:55	148447.8	570650.8	165	N	5	0.23		0.14	220		52.1	36.7		0.083	112		0.35
J1T647	11/19/2013 12:00	148454.7	570657.1	159	N	5	0.5		0.14	582		52.4	39.2		0.083	199		0.35
J1T648	11/19/2013 12:05	148471.3	570670.5	217	N	5.1	0.29		0.14	519		52.9	43.7		0.084	116		0.36
J1T649	11/19/2013 12:10	148440.9	570679.3	115	N	5.2	0.15	U	0.15	235		54.4	55.8		0.087	49.5		0.37
J1T650	11/19/2013 12:15	148424.7	570679.2	214	N	5.8	0.16	U	0.16	225		60.3	35.5		0.096	82.2		0.41
J1T651	11/19/2013 12:20	148428.6	570662.9	98.3	N	5.5	0.16	U	0.16	294		57.4	63.1		0.091	43.5		0.39
J1T666	11/19/2013 12:25	148470.9	570653.6	114	N	5.4	0.15	U	0.15	205		56.5	42.6		0.09	35		0.38
J1T667	11/19/2013 12:30	148487.9	570660.9	107	N	5.4	0.15	U	0.15	190		56.1	42.8		0.089	34.3		0.38

Table B-3. 100-N-93 In-Process Sampling Results. (16 Pages)

Sample Number	Sample Date/Time	Northing	Easting	TPH - Diesel			TPH - Diesel Ext.			Percent moisture (wet sample)		
				ug/kg	Q	PQL	ug/kg	Q	PQL	%	Q	PQL
J1RJR8	3/28/2013 10:28	148465.6	570689							10.4		0
J1RJR9	3/28/2013 10:35	148468	570689.6							7.9		0
J1RJT0	3/28/2013 10:39									7.3		0
J1RP74	6/17/2013 12:05	148495.5	570724.7	34000		1000	17000		680	1.5		0
J1RP75	6/17/2013 12:10	148450.6	570730.9	1000	U	1000	680	U	680	0.94		0
J1RP76	6/17/2013 12:20	148431.2	570692.4	990	U	990	670	U	670	1.3		0
J1RP77	6/17/2013 12:25	148430.4	570652.9	1000	U	1000	680	U	680	1.3		0
J1RP78	6/17/2013 12:30	148446.7	570649.9	14000		950	8100		650	0.33		0
J1T0V8	9/10/2013 14:20	148435.8	570701.6	9200		930	6800		630	2.2		0
J1T0V9	9/10/2013 14:25	148440.9	570657.6	78000		920	50000		630	1.6		0
J1T0W0	9/10/2013 14:30	148452.6	570664.6	4400		920	2800	J	630	0.44		0
J1T0W1	9/10/2013 14:35	148456.9	570672	15000		980	6500		670	2		0
J1T0W2	9/10/2013 14:40	148441.4	570679.9	7000		970	4300		660	2.3		0
J1T4N9	10/30/2013 13:30	148501.4	570710.5	8400	B	1000	4600	B	690	7.5		0
J1T4P0	10/30/2013 13:35	148480.8	570721.1	1600	JB	1000	1200	JB	680	1.6		0
J1T4P1	10/30/2013 13:40	148460.9	570739.8	2400	JB	980	1900	JB	670	2.1		0
J1T4P2	10/30/2013 13:45	148443.7	570717.6	2000	JB	970	1600	JB	660	1.7		0
J1T4P3	10/30/2013 13:50	148464.2	570709.1	1700	JB	1000	1300	JB	680	2.5		0
J1T4P4	10/30/2013 13:55	148483.5	570700.2	2400	JB	940	1900	JB	640	0.68		0
J1T4P5	10/30/2013 14:00	148480.9	570683.9	2400	JB	970	1700	JB	660	0.93		0
J1T4P6	10/30/2013 14:05	148461.9	570696.2	3300	JB	1000	2400	JB	680	2.8		0
J1T4P7	10/30/2013 14:10	148459.6	570686.1	570000	B	950	250000	B	640	1.5		0
J1T4P8	10/30/2013 14:15	148447	570702.1	2900	JB	990	2200	JB	670	1.4		0
J1T646	11/19/2013 11:55	148447.8	570650.8	18000	B	1000	10000	B	690	2.3		0
J1T647	11/19/2013 12:00	148454.7	570657.1	15000	B	1000	10000	B	700	3.8		0
J1T648	11/19/2013 12:05	148471.3	570670.5	7000	B	1000	4800	B	690	3		0
J1T649	11/19/2013 12:10	148440.9	570679.3	2200	JB	1000	1600	JB	700	3.2		0
J1T650	11/19/2013 12:15	148424.7	570679.2	4500	B	1100	2700	JB	720	5.9		0
J1T651	11/19/2013 12:20	148428.6	570662.9	2800	JB	980	2200	JB	670	3		0
J1T666	11/19/2013 12:25	148470.9	570653.6	4200	B	990	2900	JB	680	1.4		0
J1T667	11/19/2013 12:30	148487.9	570660.9	3400	JB	1000	2200	JB	680	2.6		0
J1TFL9	3/13/2014 13:50	148435.8	570701.6	2700	J	1000	2100	J	690	3.3		0
J1TFM0	3/13/2014 14:00	148452.6	570664.6	1000	U	1000	700	U	700	3.8		0
J1TFM1	3/13/2014 14:05	148455	570671.9	1000	U	1000	680	U	680	4.1		0
J1TFM2	3/13/2014 14:10	148456.9	570672	27000		1000	12000		690	6.5		0
J1TFM3	3/13/2014 14:15	148459.6	570686.1	2000	J	1000	1500	J	680	5.8		0
J1TFM4	3/13/2014 14:20	148452	570690.9	3200	J	1000	2500	J	690	8.6		0
J1TFM5	3/13/2014 14:25	148458.3	570657.5	2200	J	1100	1800	J	720	6.8		0
J1TFM6	3/13/2014 14:30	148465.5	570671.9	1100	U	1100	710	U	710	7		0
J1TFM7	3/13/2014 14:35	148459.5	570698.3	2200	J	1000	2100	J	710	6.1		0
J1TFM8	3/13/2014 14:40	148467	570681.2	1000	U	1000	710	U	710	5.4		0
J1TFM9	3/13/2014 14:45	148468.5	570689.7	1200	J	1000	1000	J	680	0.9		0
J1TFN0	3/13/2014 14:50	148469.6	570705.1	1000	U	1000	710	U	710	4.7		0
J1TFN1	3/13/2014 14:55	148440.9	570657.6							2.8		0

Table B-3. 100-N-93 In-Process Sampling Results. (16 Pages)

Sample Number		J1RP74			J1RP75			J1RP76			J1RP77			J1RP78		
Constituent	Class	06/17/13 12:05			06/17/13 12:10			06/17/13 12:20			06/17/13 12:25			06/17/13 12:30		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	10	U	10	9.9	U	9.9	9.9	U	9.9	9.8	U	9.8
Acenaphthylene	PAH	9.1	U	9.1	9	U	9	8.9	U	8.9	8.9	U	8.9	8.9	U	8.9
Anthracene	PAH	3.1	U	3.1	3	U	3	3	U	3	3	U	3	3	U	3
Benzo(a)anthracene	PAH	3.2	U	3.2	3.2	U	3.2	3.2	U	3.2	3.1	U	3.1	3.1	U	3.1
Benzo(a)pyrene	PAH	6.5	U	6.5	6.4	U	6.4	6.4	U	6.4	6.3	U	6.3	6.3	U	6.3
Benzo(b)fluoranthene	PAH	4.2	U	4.2	4.2	U	4.2	4.2	U	4.2	4.1	U	4.1	4.1	U	4.1
Benzo(ghi)perylene	PAH	7.3	U	7.3	7.2	U	7.2	7.2	U	7.2	7.1	U	7.1	7.1	U	7.1
Benzo(k)fluoranthene	PAH	4	U	4	3.9	U	3.9	3.9	U	3.9	3.9	U	3.9	3.9	U	3.9
Chrysene	PAH	4.9	U	4.9	4.8	U	4.8	4.8	U	4.8	4.8	U	4.8	4.8	U	4.8
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
Fluorene	PAH	5.3	U	5.3	5.3	U	5.3	5.2	U	5.2	5.2	U	5.2	5.2	U	5.2
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
Naphthalene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
Phenanthrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
Pyrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
Aroclor-1016	PCB	2.8	U	2.8	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6	2.6	U	2.6
Aroclor-1221	PCB	8.1	U	8.1	7.8	U	7.8	7.8	U	7.8	7.6	U	7.6	7.5	U	7.5
Aroclor-1232	PCB	2	U	2	1.9	U	1.9	2	U	2	1.9	U	1.9	1.9	U	1.9
Aroclor-1242	PCB	4.7	U	4.7	4.5	U	4.5	4.6	U	4.6	4.4	U	4.4	4.4	U	4.4
Aroclor-1248	PCB	4.7	U	4.7	4.5	U	4.5	4.6	U	4.6	4.4	U	4.4	4.4	U	4.4
Aroclor-1254	PCB	2.6	U	2.6	2.5	U	2.5	2.5	U	2.5	2.5	U	2.5	7.3	J	2.4
Aroclor-1260	PCB	3.5	J	2.6	2.5	U	2.5	2.5	U	2.5	2.5	U	2.5	2.4	U	2.4
Aroclor-1262	PCB															
Aroclor-1268	PCB															
1,2,4-Trichlorobenzene	SVOA	27	U	27	28	U	28	28	U	28	26	U	26	27	U	27
1,2-Dichlorobenzene	SVOA	21	U	21	22	U	22	22	U	22	21	U	21	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	11	U	11	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	13	U	13	14	U	14	13	U	13	13	U	13
2,4,5-Trichlorophenol	SVOA	9.7	U	9.7	9.8	U	9.8	10	U	10	9.4	U	9.4	9.8	U	9.8
2,4,6-Trichlorophenol	SVOA	9.7	U	9.7	9.8	U	9.8	10	U	10	9.4	U	9.4	9.8	U	9.8
2,4-Dichlorophenol	SVOA	9.7	U	9.7	9.8	U	9.8	10	U	10	9.4	U	9.4	9.8	U	9.8
2,4-Dimethylphenol	SVOA	64	U	64	65	U	65	66	U	66	62	U	62	65	U	65
2,4-Dinitrophenol	SVOA	320	U	320	330	U	330	330	U	330	310	U	310	330	U	330
2,4-Dinitrotoluene	SVOA	64	U	64	65	U	65	66	U	66	62	U	62	65	U	65
2,6-Dinitrotoluene	SVOA	27	U	27	28	U	28	28	U	28	26	U	26	27	U	27
2-Chloronaphthalene	SVOA	9.7	U	9.7	9.8	U	9.8	10	U	10	9.4	U	9.4	9.8	U	9.8
2-Chlorophenol	SVOA	20	U	20	21	U	21	21	U	21	20	U	20	21	U	21
2-Methylnaphthalene	SVOA	18	U	18	19	U	19	19	U	19	18	U	18	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	12	U	12	13	U	13
2-Nitroaniline	SVOA	49	U	49	49	U	49	50	U	50	47	U	47	49	U	49
2-Nitrophenol	SVOA	9.7	U	9.7	9.8	U	9.8	10	U	10	9.4	U	9.4	9.8	U	9.8
3,3'-Dichlorobenzidine	SVOA	87	U	87	88	U	88	90	U	90	84	U	84	88	U	88
3+4 Methylphenol (cresol, m+p)	SVOA	32	U	32	32	U	32	33	U	33	31	U	31	32	U	32
3-Nitroaniline	SVOA	71	U	71	72	U	72	73	U	73	68	U	68	71	U	71
4,6-Dinitro-2-methylphenol	SVOA	320	U	320	320	U	320	330	U	330	310	U	310	320	U	320
4-Bromophenylphenyl ether	SVOA	18	U	18	19	U	19	19	U	19	18	U	18	19	U	19
4-Chloro-3-methylphenol	SVOA	64	U	64	65	U	65	66	U	66	62	U	62	65	U	65
4-Chloroaniline	SVOA	79	U	79	81	U	81	82	U	82	77	U	77	80	U	80
4-Chlorophenylphenyl ether	SVOA	20	U	20	21	U	21	21	U	21	20	U	20	21	U	21
4-Nitroaniline	SVOA	70	U	70	71	U	71	73	U	73	68	U	68	71	U	71
4-Nitrophenol	SVOA	94	U	94	95	U	95	97	U	97	91	U	91	95	U	95
Acenaphthene	SVOA	10	U	10	10	U	10	10	U	10	9.7	U	9.7	10	U	10
Acenaphthylene	SVOA	16	U	16	17	U	17	17	U	17	16	U	16	17	U	17

Table B-3. 100-N-93 In-Process Sampling Results. (16 Pages)

Sample Number		J1RP74			J1RP75			J1RP76			J1RP77			J1RP78		
Constituent	Class	06/17/13 12:05			06/17/13 12:10			06/17/13 12:20			06/17/13 12:25			06/17/13 12:30		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Anthracene	SVOA	16	U	16	17	U	17	17	U	17	16	U	16	17	U	17
Benzo(a)anthracene	SVOA	19	U	19	20	U	20	20	U	20	19	U	19	20	U	20
Benzo(a)pyrene	SVOA	19	U	19	20	U	20	20	U	20	19	U	19	20	U	20
Benzo(b)fluoranthene	SVOA	25	U	25	26	U	26	26	U	26	25	U	25	26	U	26
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	16	U	16	15	U	15	16	U	16
Benzo(k)fluoranthene	SVOA	39	U	39	39	U	39	40	U	40	38	U	38	39	U	39
Bis(2-chloro-1-methylethyl)ether	SVOA	22	U	22	23	U	23	23	U	23	22	U	22	22	U	22
Bis(2-Chloroethoxy)methane	SVOA	22	U	22	23	U	23	23	U	23	22	U	22	22	U	22
Bis(2-chloroethyl) ether	SVOA	16	U	16	16	U	16	17	U	17	16	U	16	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	45	U	45	45	U	45	46	U	46	43	U	43	45	U	45
Butylbenzylphthalate	SVOA	42	U	42	42	U	42	43	U	43	40	U	40	42	U	42
Carbazole	SVOA	35	U	35	35	U	35	36	U	36	34	U	34	35	U	35
Chrysene	SVOA	26	U	26	27	U	27	27	U	27	25	U	25	26	U	26
Dibenz[a,h]anthracene	SVOA	18	U	18	19	U	19	19	U	19	18	U	18	19	U	19
Dibenzofuran	SVOA	19	U	19	20	U	20	20	U	20	19	U	19	20	U	20
Diethyl phthalate	SVOA	25	U	25	26	U	26	26	U	26	24	U	24	25	U	25
Dimethyl phthalate	SVOA	22	U	22	23	U	23	23	U	23	22	U	22	22	U	22
Di-n-butylphthalate	SVOA	28	U	28	29	U	29	29	U	29	27	U	27	28	U	28
Di-n-octylphthalate	SVOA	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
Fluoranthene	SVOA	35	U	35	35	U	35	36	U	36	34	U	34	35	U	35
Fluorene	SVOA	17	U	17	18	U	18	18	U	18	17	U	17	18	U	18
Hexachlorobenzene	SVOA	28	U	28	29	U	29	29	U	29	27	U	27	28	U	28
Hexachlorobutadiene	SVOA	9.7	U	9.7	9.8	U	9.8	10	U	10	9.4	U	9.4	9.8	U	9.8
Hexachlorocyclopentadiene	SVOA	49	U	49	49	U	49	50	U	50	47	U	47	49	U	49
Hexachloroethane	SVOA	21	U	21	21	U	21	21	U	21	20	U	20	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	21	U	21	22	U	22	22	U	22	21	U	21	22	U	22
Isophorone	SVOA	16	U	16	17	U	17	17	U	17	16	U	16	17	U	17
Naphthalene	SVOA	30	U	30	30	U	30	31	U	31	29	U	29	30	U	30
Nitrobenzene	SVOA	21	U	21	22	U	22	22	U	22	21	U	21	22	U	22
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30	30	U	30	31	U	31	29	U	29	30	U	30
N-Nitrosodiphenylamine	SVOA	20	U	20	21	U	21	21	U	21	20	U	20	21	U	21
Pentachlorophenol	SVOA	320	U	320	320	U	320	330	U	330	310	U	310	320	U	320
Phenanthrene	SVOA	20	J	16	17	U	17	17	U	17	16	U	16	17	U	17
Phenol	SVOA	17	U	17	18	U	18	18	U	18	17	U	17	18	U	18
Pyrene	SVOA	33	J	12	12	U	12	12	U	12	11	U	11	12	U	12

Table B-3. 100-N-93 In-Process Sampling Results. (16 Pages)

Sample Number		J1T0V8			J1T0V9			J1T0W0			J1T0W1			J1T0W2		
Constituent	Class	09/10/13 02:20			09/10/13 02:25			09/10/13 02:30			09/10/13 02:35			09/10/13 02:40		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	110	NX	9.3	9.7	U	9.7	10	U	10	9.6	U	9.6
Acenaphthylene	PAH	9.1	U	9.1	8.3	U	8.3	8.7	U	8.7	9.2	U	9.2	8.6	U	8.6
Anthracene	PAH	3.1	U	3.1	400	N	2.8	3	U	3	3.1	U	3.1	2.9	U	2.9
Benzo(a)anthracene	PAH	3.2	U	3.2	260	N	3	3.1	U	3.1	7.6	J	3.3	3.1	U	3.1
Benzo(a)pyrene	PAH	6.5	U	6.5	210	N	5.9	6.2	U	6.2	6.5	U	6.5	6.1	U	6.1
Benzo(b)fluoranthene	PAH	4.3	U	4.3	220	NX	3.9	4.1	U	4.1	4.3	U	4.3	4	U	4
Benzo(ghi)perylene	PAH	7.3	U	7.3	190	N	6.7	7	U	7	7.3	U	7.3	6.9	U	6.9
Benzo(k)fluoranthene	PAH	4	U	4	65	N	3.7	3.8	U	3.8	4	U	4	3.8	U	3.8
Chrysene	PAH	6.4	J	4.9	370	N	4.5	4.7	U	4.7	14	J	4.9	4.6	U	4.6
Dibenz[a,h]anthracene	PAH	11	U	11	42		10	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	13	U	13	1200	N	12	13	U	13	13	U	13	12	U	12
Fluorene	PAH	5.4	U	5.4	150	N	4.9	5.1	U	5.1	5.4	U	5.4	5	U	5
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	170	N	11	12	U	12	12	U	12	11	U	11
Naphthalene	PAH	12	U	12	11	UN	11	12	U	12	12	U	12	11	U	11
Phenanthrene	PAH	12	U	12	830	N	11	12	U	12	12	U	12	11	U	11
Pyrene	PAH	12	U	12	1100	N	11	12	U	12	12	U	12	11	U	11
Aroclor-1016	PCB	2.8	U	2.8	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6
Aroclor-1221	PCB	8.1	U	8.1	7.9	U	7.9	7.8	U	7.8	7.8	U	7.8	7.5	U	7.5
Aroclor-1232	PCB	2	U	2	2	U	2	1.9	U	1.9	1.9	U	1.9	1.9	U	1.9
Aroclor-1242	PCB	4.7	U	4.7	4.6	U	4.6	4.5	U	4.5	15		4.5	4.4	U	4.4
Aroclor-1248	PCB	4.7	U	4.7	4.6	U	4.6	4.5	U	4.5	4.5	U	4.5	4.4	U	4.4
Aroclor-1254	PCB	12		2.6	2.6	U	2.6	2.5	U	2.5	14		2.5	3.3	JP	2.4
Aroclor-1260	PCB	2.6	U	2.6	2.6	U	2.6	2.5	U	2.5	2.5	U	2.5	2.4	U	2.4
Aroclor-1262	PCB															
Aroclor-1268	PCB															
1,2,4-Trichlorobenzene	SVOA	28	U	28	26	U	26	28	U	28	28	U	28	27	U	27
1,2-Dichlorobenzene	SVOA	22	U	22	20	U	20	22	U	22	22	U	22	21	U	21
1,3-Dichlorobenzene	SVOA	12	U	12	11	U	11	12	U	12	12	U	12	11	U	11
1,4-Dichlorobenzene	SVOA	14	U	14	13	U	13	13	U	13	14	U	14	13	U	13
2,4,5-Trichlorophenol	SVOA	10	U	10	9.2	U	9.2	9.8	U	9.8	9.9	U	9.9	9.5	U	9.5
2,4,6-Trichlorophenol	SVOA	10	U	10	9.2	U	9.2	9.8	U	9.8	9.9	U	9.9	9.5	U	9.5
2,4-Dichlorophenol	SVOA	10	U	10	9.2	U	9.2	9.8	U	9.8	9.9	U	9.9	9.5	U	9.5
2,4-Dimethylphenol	SVOA	66	U	66	61	U	61	65	U	65	66	U	66	63	U	63
2,4-Dinitrophenol	SVOA	330	U	330	310	U	310	330	U	330	330	U	330	320	U	320
2,4-Dinitrotoluene	SVOA	66	U	66	61	U	61	65	U	65	66	U	66	63	U	63
2,6-Dinitrotoluene	SVOA	28	U	28	26	U	26	28	U	28	28	U	28	27	U	27
2-Chloronaphthalene	SVOA	10	U	10	9.2	U	9.2	9.8	U	9.8	9.9	U	9.9	9.5	U	9.5
2-Chlorophenol	SVOA	21	U	21	19	U	19	21	U	21	21	U	21	20	U	20
2-Methylnaphthalene	SVOA	19	U	19	18	U	18	19	U	19	19	U	19	18	U	18
2-Methylphenol (cresol, o-)	SVOA	13	U	13	12	U	12	13	U	13	13	U	13	12	U	12
2-Nitroaniline	SVOA	50	U	50	46	U	46	49	U	49	50	U	50	48	U	48
2-Nitrophenol	SVOA	10	U	10	9.2	U	9.2	9.8	U	9.8	9.9	U	9.9	9.5	U	9.5
3,3'-Dichlorobenzidine	SVOA	90	U	90	83	U	83	89	U	89	89	U	89	86	U	86
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	30	U	30	32	U	32	33	U	33	31	U	31
3-Nitroaniline	SVOA	73	U	73	67	U	67	72	U	72	73	U	73	70	U	70
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	300	U	300	320	U	320	330	U	330	310	U	310
4-Bromophenylphenyl ether	SVOA	19	U	19	18	U	18	19	U	19	19	U	19	18	U	18
4-Chloro-3-methylphenol	SVOA	66	U	66	61	U	61	65	U	65	66	U	66	63	U	63
4-Chloroaniline	SVOA	82	U	82	76	U	76	81	U	81	81	U	81	78	U	78
4-Chlorophenylphenyl ether	SVOA	21	U	21	19	U	19	21	U	21	21	U	21	20	U	20
4-Nitroaniline	SVOA	72	U	72	67	U	67	71	U	71	72	U	72	69	U	69
4-Nitrophenol	SVOA	97	U	97	90	U	90	96	U	96	96	U	96	92	U	92
Acenaphthene	SVOA	10	U	10	43	J	9.5	10	U	10	10	U	10	9.8	U	9.8
Acenaphthylene	SVOA	17	U	17	16	U	16	17	U	17	17	U	17	16	U	16

Table B-3. 100-N-93 In-Process Sampling Results. (16 Pages)

Sample Number		J1T0V8			J1T0V9			J1T0W0			J1T0W1			J1T0W2		
Constituent	Class	09/10/13 02:20			09/10/13 02:25			09/10/13 02:30			09/10/13 02:35			09/10/13 02:40		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Anthracene	SVOA	17	U	17	280	J	16	17	U	17	17	U	17	16	U	16
Benzo(a)anthracene	SVOA	47	J	20	210	J	18	20	U	20	20	U	20	19	U	19
Benzo(a)pyrene	SVOA	33	J	20	170	J	18	20	U	20	20	U	20	19	U	19
Benzo(b)fluoranthene	SVOA	53	J	26	350	K	24	26	U	26	26	U	26	25	U	25
Benzo(ghi)perylene	SVOA	16	U	16	130	J	15	16	U	16	16	U	16	15	U	15
Benzo(k)fluoranthene	SVOA	40	U	40	37	UK	37	39	U	39	40	U	40	38	U	38
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	21	U	21	23	U	23	23	U	23	22	U	22
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	21	U	21	23	U	23	23	U	23	22	U	22
Bis(2-chloroethyl) ether	SVOA	17	U	17	15	U	15	16	U	16	16	U	16	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	46	U	46	42	U	42	45	U	45	46	U	46	520		44
Butylbenzylphthalate	SVOA	43	U	43	40	U	40	42	U	42	43	U	43	41	U	41
Carbazole	SVOA	36	U	36	75	J	33	35	U	35	36	U	36	34	U	34
Chrysene	SVOA	53	J	27	300		25	27	U	27	27	U	27	26	U	26
Dibenz[a,h]anthracene	SVOA	19	U	19	28	J	18	19	U	19	19	U	19	18	U	18
Dibenzofuran	SVOA	20	U	20	37	J	18	20	U	20	20	U	20	19	U	19
Diethyl phthalate	SVOA	26	U	26	24	U	24	26	U	26	26	U	26	25	U	25
Dimethyl phthalate	SVOA	180	JB	23	300	B	21	80	JB	23	190	JB	23	220	JB	22
Di-n-butylphthalate	SVOA	29	U	29	27	U	27	29	U	29	29	U	29	28	U	28
Di-n-octylphthalate	SVOA	14	U	14	13	U	13	14	U	14	14	U	14	14	U	14
Fluoranthene	SVOA	95	J	36	1000		33	35	U	35	36	U	36	34	U	34
Fluorene	SVOA	18	U	18	110	J	17	18	U	18	18	U	18	17	U	17
Hexachlorobenzene	SVOA	29	U	29	27	U	27	29	U	29	29	U	29	28	U	28
Hexachlorobutadiene	SVOA	10	U	10	9.2	U	9.2	9.8	U	9.8	9.9	U	9.9	9.5	U	9.5
Hexachlorocyclopentadiene	SVOA	50	U	50	46	U	46	49	U	49	50	U	50	48	U	48
Hexachloroethane	SVOA	21	U	21	20	U	20	21	U	21	21	U	21	20	U	20
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	140	J	20	22	U	22	22	U	22	21	U	21
Isophorone	SVOA	17	U	17	16	U	16	17	U	17	17	U	17	16	U	16
Naphthalene	SVOA	31	U	31	29	U	29	31	U	31	31	U	31	30	U	30
Nitrobenzene	SVOA	22	U	22	20	U	20	22	U	22	22	U	22	21	U	21
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	29	U	29	31	U	31	31	U	31	30	U	30
N-Nitrosodiphenylamine	SVOA	21	U	21	19	U	19	21	U	21	21	U	21	20	U	20
Pentachlorophenol	SVOA	330	U	330	300	U	300	320	U	320	330	U	330	310	U	310
Phenanthrene	SVOA	17	U	17	870		16	17	U	17	17	U	17	16	U	16
Phenol	SVOA	18	U	18	17	U	17	18	U	18	18	U	18	17	U	17
Pyrene	SVOA	100	J	12	950		11	12	U	12	12	J	12	12	U	12

Table B-3. 100-N-93 In-Process Sampling Results. (16 Pages)

Sample Number		J1T4N9			J1T4P0			J1T4P1			J1T4P2			J1T4P3		
Constituent	Class	10/30/13 01:30			10/30/13 01:35			10/30/13 01:40			10/30/13 01:45			10/30/13 01:50		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	11	U	11	10	U	10	10	U	10	10	U	10	9.4	U	9.4
Acenaphthylene	PAH	9.7	U	9.7	9	U	9	9.2	U	9.2	9	U	9	8.4	U	8.4
Anthracene	PAH	3.3	U	3.3	3	U	3	3.1	U	3.1	3	U	3	2.9	U	2.9
Benzo(a)anthracene	PAH	83	X	3.4	3.2	U	3.2	3.3	U	3.3	3.2	U	3.2	3	U	3
Benzo(a)pyrene	PAH	65		6.9	6.4	U	6.4	6.6	U	6.6	6.4	U	6.4	6	U	6
Benzo(b)fluoranthene	PAH	34	X	4.5	4.2	U	4.2	4.3	U	4.3	4.2	U	4.2	3.9	U	3.9
Benzo(ghi)perylene	PAH	13	JN	7.8	7.2	U	7.2	7.4	U	7.4	7.2	U	7.2	6.8	U	6.8
Benzo(k)fluoranthene	PAH	18		4.3	3.9	U	3.9	4	U	4	3.9	U	3.9	3.7	U	3.7
Chrysene	PAH	98		5.2	4.8	U	4.8	5	U	5	4.8	U	4.8	4.5	U	4.5
Dibenz[a,h]anthracene	PAH	12	U	12	11	U	11	11	U	11	11	U	11	10	U	10
Fluoranthene	PAH	98		14	13	U	13	13	U	13	13	U	13	12	U	12
Fluorene	PAH	5.7	U	5.7	5.3	U	5.3	5.4	U	5.4	5.3	U	5.3	5	U	5
Indeno(1,2,3-cd)pyrene	PAH	25	J	13	12	U	12	12	U	12	12	U	12	11	U	11
Naphthalene	PAH	13	U	13	12	U	12	12	U	12	12	U	12	11	U	11
Phenanthrene	PAH	13	U	13	12	U	12	12	U	12	12	U	12	11	U	11
Pyrene	PAH	100		13	12	U	12	12	U	12	12	U	12	11	U	11
Aroclor-1016	PCB	2.8	U	2.8	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7
Aroclor-1221	PCB	8.2	U	8.2	7.8	U	7.8	7.8	U	7.8	7.8	U	7.8	8	U	8
Aroclor-1232	PCB	2.1	U	2.1	1.9	U	1.9	1.9	U	1.9	2	U	2	2	U	2
Aroclor-1242	PCB	4.8	U	4.8	4.5	U	4.5	4.5	U	4.5	4.6	U	4.6	4.6	U	4.6
Aroclor-1248	PCB	4.8	U	4.8	4.5	U	4.5	4.5	U	4.5	4.6	U	4.6	4.6	U	4.6
Aroclor-1254	PCB	2.7	U	2.7	2.5	U	2.5	2.5	U	2.5	2.5	U	2.5	2.6	U	2.6
Aroclor-1260	PCB	7.4	J	2.7	2.5	U	2.5	2.5	U	2.5	2.5	U	2.5	2.6	U	2.6
Aroclor-1262	PCB															
Aroclor-1268	PCB															
1,2,4-Trichlorobenzene	SVOA	29	U	29	26	U	26	28	U	28	27	U	27	28	U	28
1,2-Dichlorobenzene	SVOA	23	U	23	21	U	21	22	U	22	21	U	21	22	U	22
1,3-Dichlorobenzene	SVOA	13	U	13	11	U	11	12	U	12	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	14	U	14	13	U	13	14	U	14	13	U	13	13	U	13
2,4,5-Trichlorophenol	SVOA	11	U	11	9.3	U	9.3	10	U	10	9.7	U	9.7	9.8	U	9.8
2,4,6-Trichlorophenol	SVOA	11	U	11	9.3	U	9.3	10	U	10	9.7	U	9.7	9.8	U	9.8
2,4-Dichlorophenol	SVOA	11	U	11	9.3	U	9.3	10	U	10	9.7	U	9.7	9.8	U	9.8
2,4-Dimethylphenol	SVOA	70	U	70	62	U	62	66	U	66	64	U	64	65	U	65
2,4-Dinitrophenol	SVOA	350	U	350	310	UJ	310	330	U	330	320	U	320	330	U	330
2,4-Dinitrotoluene	SVOA	70	U	70	62	U	62	66	U	66	64	U	64	65	U	65
2,6-Dinitrotoluene	SVOA	29	U	29	26	U	26	28	U	28	27	U	27	28	U	28
2-Chloronaphthalene	SVOA	11	U	11	9.3	U	9.3	10	U	10	9.7	U	9.7	9.8	U	9.8
2-Chlorophenol	SVOA	22	U	22	20	U	20	21	U	21	20	U	20	21	U	21
2-Methylnaphthalene	SVOA	20	U	20	18	U	18	19	U	19	18	U	18	19	U	19
2-Methylphenol (cresol, o-)	SVOA	14	U	14	12	U	12	13	U	13	13	U	13	13	U	13
2-Nitroaniline	SVOA	53	U	53	47	U	47	50	U	50	48	U	48	49	U	49
2-Nitrophenol	SVOA	11	U	11	9.3	U	9.3	10	U	10	9.7	U	9.7	9.8	U	9.8
3,3'-Dichlorobenzidine	SVOA	95	U	95	84	U	84	90	U	90	87	U	87	88	U	88
3+4 Methylphenol (cresol, m+p)	SVOA	35	U	35	31	U	31	33	U	33	32	U	32	32	U	32
3-Nitroaniline	SVOA	77	U	77	68	U	68	73	U	73	71	U	71	72	U	72
4,6-Dinitro-2-methylphenol	SVOA	350	U	350	310	U	310	330	U	330	320	U	320	320	U	320
4-Bromophenylphenyl ether	SVOA	20	U	20	18	U	18	19	U	19	18	U	18	19	U	19
4-Chloro-3-methylphenol	SVOA	70	U	70	62	U	62	66	U	66	64	U	64	65	U	65
4-Chloroaniline	SVOA	86	U	86	76	U	76	82	U	82	79	U	79	81	U	81
4-Chlorophenylphenyl ether	SVOA	22	U	22	20	U	20	21	U	21	20	U	20	21	U	21
4-Nitroaniline	SVOA	76	U	76	68	U	68	73	U	73	70	U	70	71	U	71
4-Nitrophenol	SVOA	100	U	100	90	U	90	97	U	97	94	U	94	95	U	95
Acenaphthene	SVOA	11	U	11	9.6	U	9.6	10	U	10	10	U	10	10	U	10
Acenaphthylene	SVOA	18	U	18	16	U	16	17	U	17	16	U	16	17	U	17

Table B-3. 100-N-93 In-Process Sampling Results. (16 Pages)

Sample Number		J1T4N9			J1T4P0			J1T4P1			J1T4P2			J1T4P3		
Constituent	Class	10/30/13 01:30			10/30/13 01:35			10/30/13 01:40			10/30/13 01:45			10/30/13 01:50		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Anthracene	SVOA	18	U	18	16	U	16	17	U	17	16	U	16	17	U	17
Benzo(a)anthracene	SVOA	32	J	21	19	U	19	20	U	20	19	U	19	20	U	20
Benzo(a)pyrene	SVOA	22	J	21	19	U	19	20	U	20	19	U	19	20	U	20
Benzo(b)fluoranthene	SVOA	28	U	28	24	U	24	26	U	26	25	U	25	26	U	26
Benzo(ghi)perylene	SVOA	17	U	17	15	U	15	16	U	16	16	U	16	16	U	16
Benzo(k)fluoranthene	SVOA	42	U	42	37	U	37	40	U	40	39	U	39	39	U	39
Bis(2-chloro-1-methylethyl)ether	SVOA	24	U	24	21	U	21	23	U	23	22	U	22	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	24	U	24	21	U	21	23	U	23	22	U	22	23	U	23
Bis(2-chloroethyl) ether	SVOA	17	U	17	15	U	15	17	U	17	16	U	16	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	48	U	48	43	U	43	46	U	46	45	U	45	45	U	45
Butylbenzylphthalate	SVOA	45	U	45	40	U	40	43	U	43	42	U	42	42	U	42
Carbazole	SVOA	38	U	38	34	U	34	36	U	36	35	U	35	35	U	35
Chrysene	SVOA	30	J	28	25	U	25	27	U	27	26	U	26	27	U	27
Dibenz[a,h]anthracene	SVOA	20	U	20	18	U	18	19	U	19	18	U	18	19	U	19
Dibenzofuran	SVOA	21	U	21	19	U	19	20	U	20	19	U	19	20	U	20
Diethyl phthalate	SVOA	27	U	27	24	U	24	26	U	26	25	U	25	26	U	26
Dimethyl phthalate	SVOA	67	J	24	22	J	21	48	J	23	36	J	22	23	U	23
Di-n-butylphthalate	SVOA	31	U	31	27	U	27	29	U	29	28	U	28	29	U	29
Di-n-octylphthalate	SVOA	15	U	15	13	U	13	14	U	14	14	U	14	14	U	14
Fluoranthene	SVOA	40	J	38	34	U	34	36	U	36	35	U	35	35	U	35
Fluorene	SVOA	19	U	19	17	U	17	18	U	18	17	U	17	18	U	18
Hexachlorobenzene	SVOA	31	U	31	27	U	27	29	U	29	28	U	28	29	U	29
Hexachlorobutadiene	SVOA	11	U	11	9.3	U	9.3	10	U	10	9.7	U	9.7	9.8	U	9.8
Hexachlorocyclopentadiene	SVOA	53	U	53	47	U	47	50	U	50	48	U	48	49	U	49
Hexachloroethane	SVOA	22	U	22	20	U	20	21	U	21	21	U	21	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	23	U	23	21	U	21	22	U	22	21	U	21	22	U	22
Isophorone	SVOA	18	U	18	16	U	16	17	U	17	16	U	16	17	U	17
Naphthalene	SVOA	33	U	33	29	U	29	31	U	31	30	U	30	30	U	30
Nitrobenzene	SVOA	23	U	23	21	U	21	22	U	22	21	U	21	22	U	22
N-Nitroso-di-n-dipropylamine	SVOA	33	U	33	29	U	29	31	U	31	30	U	30	30	U	30
N-Nitrosodiphenylamine	SVOA	22	U	22	20	U	20	21	U	21	20	U	20	21	U	21
Pentachlorophenol	SVOA	350	U	350	310	U	310	330	U	330	320	U	320	320	U	320
Phenanthrene	SVOA	23	J	18	16	U	16	17	U	17	16	U	16	17	U	17
Phenol	SVOA	19	U	19	17	U	17	18	U	18	17	U	17	18	U	18
Pyrene	SVOA	44	J	13	11	U	11	12	U	12	12	U	12	12	U	12

Table B-3. 100-N-93 In-Process Sampling Results. (16 Pages)

Sample Number		J1T4P4			J1T4P5			J1T4P6			J1T4P7			J1T4P8		
Constituent	Class	10/30/13 01:55			10/30/13 02:00			10/30/13 02:05			10/30/13 02:10			10/30/13 02:15		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.3	U	9.3	9.8	U	9.8	10	U	10	9.7	U	9.7	9.3	U	9.3
Acenaphthylene	PAH	8.4	U	8.4	8.8	U	8.8	9.1	U	9.1	8.7	U	8.7	8.4	U	8.4
Anthracene	PAH	2.8	U	2.8	3	U	3	3.1	U	3.1	3	U	3	2.8	U	2.8
Benzo(a)anthracene	PAH	3	U	3	3.1	U	3.1	3.2	U	3.2	3.1	U	3.1	3	U	3
Benzo(a)pyrene	PAH	6	U	6	6.3	U	6.3	6.5	U	6.5	6.2	U	6.2	6	U	6
Benzo(b)fluoranthene	PAH	3.9	U	3.9	4.1	U	4.1	4.2	U	4.2	4.1	U	4.1	3.9	U	3.9
Benzo(ghi)perylene	PAH	6.7	U	6.7	7.1	U	7.1	7.3	U	7.3	7	U	7	6.7	U	6.7
Benzo(k)fluoranthene	PAH	3.7	U	3.7	3.9	U	3.9	4	U	4	3.8	U	3.8	3.7	U	3.7
Chrysene	PAH	4.5	U	4.5	4.7	U	4.7	4.9	U	4.9	4.7	U	4.7	4.5	U	4.5
Dibenz[a,h]anthracene	PAH	10	U	10	11	U	11	11	U	11	11	U	11	10	U	10
Fluoranthene	PAH	12	U	12	13	U	13	13	U	13	13	U	13	12	U	12
Fluorene	PAH	4.9	U	4.9	5.2	U	5.2	5.3	U	5.3	5.1	U	5.1	4.9	U	4.9
Indeno(1,2,3-cd)pyrene	PAH	11	U	11	12	U	12	12	U	12	12	U	12	11	U	11
Naphthalene	PAH	11	U	11	12	U	12	12	U	12	12	U	12	11	U	11
Phenanthrene	PAH	11	U	11	12	U	12	12	U	12	12	U	12	11	U	11
Pyrene	PAH	11	U	11	12	U	12	12	U	12	12	U	12	11	U	11
Aroclor-1016	PCB	2.5	U	2.5	2.6	U	2.6	2.8	U	2.8	2.7	U	2.7	2.8	U	2.8
Aroclor-1221	PCB	7.4	U	7.4	7.7	U	7.7	8.1	U	8.1	7.9	U	7.9	8.1	U	8.1
Aroclor-1232	PCB	1.8	U	1.8	1.9	U	1.9	2	U	2	2	U	2	2	U	2
Aroclor-1242	PCB	4.3	U	4.3	4.5	U	4.5	4.7	U	4.7	4.6	U	4.6	4.7	U	4.7
Aroclor-1248	PCB	4.3	U	4.3	4.5	U	4.5	4.7	U	4.7	4.6	U	4.6	4.7	U	4.7
Aroclor-1254	PCB	2.4	U	2.4	2.5	U	2.5	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6
Aroclor-1260	PCB	2.4	U	2.4	2.5	U	2.5	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6
Aroclor-1262	PCB															
Aroclor-1268	PCB															
1,2,4-Trichlorobenzene	SVOA	27	U	27	27	U	27	26	U	26	28	U	28	28	U	28
1,2-Dichlorobenzene	SVOA	21	U	21	21	U	21	20	U	20	22	U	22	22	U	22
1,3-Dichlorobenzene	SVOA	11	U	11	11	U	11	11	U	11	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	13	U	13	13	U	13	14	U	14	13	U	13
2,4,5-Trichlorophenol	SVOA	9.5	U	9.5	9.5	U	9.5	9.3	U	9.3	10	U	10	9.9	U	9.9
2,4,6-Trichlorophenol	SVOA	9.5	U	9.5	9.5	U	9.5	9.3	U	9.3	10	U	10	9.9	U	9.9
2,4-Dichlorophenol	SVOA	9.5	U	9.5	9.5	U	9.5	9.3	U	9.3	10	U	10	9.9	U	9.9
2,4-Dimethylphenol	SVOA	62	U	62	63	U	63	61	U	61	67	U	67	65	U	65
2,4-Dinitrophenol	SVOA	320	U	320	320	U	320	310	U	310	340	U	340	330	U	330
2,4-Dinitrotoluene	SVOA	62	U	62	63	U	63	61	U	61	67	U	67	65	U	65
2,6-Dinitrotoluene	SVOA	27	U	27	27	U	27	26	U	26	28	U	28	28	U	28
2-Chloronaphthalene	SVOA	9.5	U	9.5	9.5	U	9.5	9.3	U	9.3	10	U	10	9.9	U	9.9
2-Chlorophenol	SVOA	20	U	20	20	U	20	20	U	20	21	U	21	21	U	21
2-Methylnaphthalene	SVOA	18	U	18	18	U	18	18	U	18	19	U	19	19	U	19
2-Methylphenol (cresol, o-)	SVOA	12	U	12	12	U	12	12	U	12	13	U	13	13	U	13
2-Nitroaniline	SVOA	47	U	47	47	U	47	46	U	46	50	U	50	50	U	50
2-Nitrophenol	SVOA	9.5	U	9.5	9.5	U	9.5	9.3	U	9.3	10	U	10	9.9	U	9.9
3,3'-Dichlorobenzidine	SVOA	85	U	85	85	U	85	84	U	84	91	U	91	89	U	89
3+4 Methylphenol (cresol, m+p)	SVOA	31	U	31	31	U	31	31	U	31	33	U	33	33	U	33
3-Nitroaniline	SVOA	69	U	69	69	U	69	68	U	68	74	U	74	72	U	72
4,6-Dinitro-2-methylphenol	SVOA	310	U	310	310	U	310	310	U	310	330	U	330	330	U	330
4-Bromophenylphenyl ether	SVOA	18	U	18	18	U	18	18	U	18	19	U	19	19	U	19
4-Chloro-3-methylphenol	SVOA	62	U	62	63	U	63	61	U	61	67	U	67	65	U	65
4-Chloroaniline	SVOA	78	U	78	78	U	78	76	U	76	83	U	83	81	U	81
4-Chlorophenylphenyl ether	SVOA	20	U	20	20	U	20	20	U	20	21	U	21	21	U	21
4-Nitroaniline	SVOA	69	U	69	69	U	69	67	U	67	73	U	73	72	U	72
4-Nitrophenol	SVOA	92	U	92	92	U	92	90	U	90	98	U	98	96	U	96
Acenaphthene	SVOA	9.8	U	9.8	9.8	U	9.8	9.6	U	9.6	10	U	10	10	U	10
Acenaphthylene	SVOA	16	U	16	16	U	16	16	U	16	17	U	17	17	U	17

Table B-3. 100-N-93 In-Process Sampling Results. (16 Pages)

Sample Number		J1T4P4			J1T4P5			J1T4P6			J1T4P7			J1T4P8		
Constituent	Class	10/30/13 01:55			10/30/13 02:00			10/30/13 02:05			10/30/13 02:10			10/30/13 02:15		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Anthracene	SVOA	16	U	16	16	U	16	16	U	16	17	U	17	17	U	17
Benzo(a)anthracene	SVOA	19	U	19	19	U	19	19	U	19	20	U	20	20	U	20
Benzo(a)pyrene	SVOA	19	U	19	19	U	19	19	U	19	20	U	20	20	U	20
Benzo(b)fluoranthene	SVOA	25	U	25	25	U	25	24	U	24	26	U	26	26	U	26
Benzo(ghi)perylene	SVOA	15	U	15	15	U	15	15	U	15	16	U	16	16	U	16
Benzo(k)fluoranthene	SVOA	38	U	38	38	U	38	37	U	37	40	U	40	40	U	40
Bis(2-chloro-1-methylethyl)ether	SVOA	22	U	22	22	U	22	21	U	21	23	U	23	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	22	U	22	22	U	22	21	U	21	23	U	23	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16	16	U	16	15	U	15	17	U	17	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	44	U	44	44	U	44	43	U	43	46	U	46	46	U	46
Butylbenzylphthalate	SVOA	41	U	41	41	U	41	40	U	40	43	U	43	43	U	43
Carbazole	SVOA	34	U	34	34	U	34	33	U	33	36	U	36	36	U	36
Chrysene	SVOA	26	U	26	26	U	26	25	U	25	27	U	27	27	U	27
Dibenz[a,h]anthracene	SVOA	18	U	18	18	U	18	18	U	18	19	U	19	19	U	19
Dibenzofuran	SVOA	19	U	19	19	U	19	19	U	19	20	U	20	20	U	20
Diethyl phthalate	SVOA	25	U	25	25	U	25	24	U	24	26	U	26	26	U	26
Dimethyl phthalate	SVOA	39	J	22	22	U	22	21	U	21	23	U	23	23	U	23
Di-n-butylphthalate	SVOA	27	U	27	28	U	28	27	U	27	29	U	29	29	U	29
Di-n-octylphthalate	SVOA	14	U	14	14	U	14	13	U	13	15	U	15	14	U	14
Fluoranthene	SVOA	34	U	34	34	U	34	33	U	33	36	U	36	36	U	36
Fluorene	SVOA	17	U	17	17	U	17	17	U	17	18	U	18	18	U	18
Hexachlorobenzene	SVOA	27	U	27	28	U	28	27	U	27	29	U	29	29	U	29
Hexachlorobutadiene	SVOA	9.5	U	9.5	9.5	U	9.5	9.3	U	9.3	10	U	10	9.9	U	9.9
Hexachlorocyclopentadiene	SVOA	47	U	47	47	U	47	46	U	46	50	U	50	50	U	50
Hexachloroethane	SVOA	20	U	20	20	U	20	20	U	20	21	U	21	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	21	U	21	21	U	21	20	U	20	22	U	22	22	U	22
Isophorone	SVOA	16	U	16	16	U	16	16	U	16	17	U	17	17	U	17
Naphthalene	SVOA	29	U	29	29	U	29	29	U	29	31	U	31	31	U	31
Nitrobenzene	SVOA	21	U	21	21	U	21	20	U	20	22	U	22	22	U	22
N-Nitroso-di-n-dipropylamine	SVOA	29	U	29	29	U	29	29	U	29	31	U	31	31	U	31
N-Nitrosodiphenylamine	SVOA	20	U	20	20	U	20	20	U	20	21	U	21	21	U	21
Pentachlorophenol	SVOA	310	U	310	310	U	310	310	U	310	330	U	330	330	U	330
Phenanthrene	SVOA	16	U	16	16	U	16	16	U	16	17	U	17	17	U	17
Phenol	SVOA	17	U	17	17	U	17	17	U	17	18	U	18	18	U	18
Pyrene	SVOA	11	U	11	11	U	11	11	U	11	12	U	12	12	U	12

Table B-3. 100-N-93 In-Process Sampling Results. (16 Pages)

Sample Number		J1T646			J1T647			J1T648			J1T649			J1T650		
Constituent	Class	11/19/13 11:55			11/19/13 12:00			11/19/13 12:05			11/19/13 12:10			11/19/13 12:15		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	10	U	10	9.8	U	9.8	9.9	U	9.9	10	U	10
Acenaphthylene	PAH	9	U	9	9.1	U	9.1	8.9	U	8.9	8.9	U	8.9	9.4	U	9.4
Anthracene	PAH	3.1	U	3.1	3.1	U	3.1	3	U	3	3	U	3	3.2	U	3.2
Benzo(a)anthracene	PAH	3.8	J	3.2	5	J	3.2	3.1	U	3.1	3.1	U	3.1	3.3	U	3.3
Benzo(a)pyrene	PAH	7.4	J	6.4	6.5	U	6.5	6.3	U	6.3	6.3	U	6.3	6.7	U	6.7
Benzo(b)fluoranthene	PAH	4.2	U	4.2	4.3	U	4.3	4.1	U	4.1	4.1	U	4.1	4.4	U	4.4
Benzo(ghi)perylene	PAH	7.2	U	7.2	7.3	U	7.3	7.1	U	7.1	7.1	U	7.1	7.5	U	7.5
Benzo(k)fluoranthene	PAH	3.9	U	3.9	4	U	4	3.9	U	3.9	3.9	U	3.9	4.1	U	4.1
Chrysene	PAH	10	J	4.8	5.3	JX	4.9	4.8	U	4.8	4.8	U	4.8	5	U	5
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	13	U	13	13	U	13	13	U	13	13	U	13	14	U	14
Fluorene	PAH	5.3	U	5.3	5.3	U	5.3	5.2	U	5.2	5.2	U	5.2	5.5	U	5.5
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13
Naphthalene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13
Phenanthrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13
Pyrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13
Aroclor-1016	PCB	2.8	U	2.8	2.8	UN	2.8	2.8	U	2.8	2.8	U	2.8	2.9	U	2.9
Aroclor-1221	PCB	8.2	U	8.2	8.1	U	8.1	8.1	U	8.1	8.2	U	8.2	8.4	U	8.4
Aroclor-1232	PCB	2	U	2	2	U	2	2	U	2	2.1	U	2.1	2.1	U	2.1
Aroclor-1242	PCB	4.8	U	4.8	4.7	U	4.7	4.7	U	4.7	4.8	U	4.8	4.9	U	4.9
Aroclor-1248	PCB	4.8	U	4.8	4.7	U	4.7	4.7	U	4.7	4.8	U	4.8	4.9	U	4.9
Aroclor-1254	PCB	120		2.7	73		2.6	18		2.6	2.7	U	2.7	16		2.7
Aroclor-1260	PCB	2.7	U	2.7	2.6	UN	2.6	2.6	U	2.6	2.7	U	2.7	2.7	U	2.7
Aroclor-1262	PCB															
Aroclor-1268	PCB															
1,2,4-Trichlorobenzene	SVOA	27	U	27	29	U	29	28	U	28	27	U	27	28	U	28
1,2-Dichlorobenzene	SVOA	21	U	21	23	U	23	22	U	22	22	U	22	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	14	U	14	14	U	14	13	U	13	14	U	14
2,4,5-Trichlorophenol	SVOA	9.7	U	9.7	10	U	10	9.9	U	9.9	9.8	U	9.8	10	U	10
2,4,6-Trichlorophenol	SVOA	9.7	U	9.7	10	U	10	9.9	U	9.9	9.8	U	9.8	10	U	10
2,4-Dichlorophenol	SVOA	9.7	U	9.7	10	U	10	9.9	U	9.9	9.8	U	9.8	10	U	10
2,4-Dimethylphenol	SVOA	64	U	64	68	U	68	66	U	66	65	U	65	67	U	67
2,4-Dinitrophenol	SVOA	320	U	320	340	U	340	330	U	330	330	U	330	340	U	340
2,4-Dinitrotoluene	SVOA	64	U	64	68	U	68	66	U	66	65	U	65	67	U	67
2,6-Dinitrotoluene	SVOA	27	U	27	29	U	29	28	U	28	27	U	27	28	U	28
2-Chloronaphthalene	SVOA	9.7	U	9.7	10	U	10	9.9	U	9.9	9.8	U	9.8	10	U	10
2-Chlorophenol	SVOA	20	U	20	22	U	22	21	U	21	21	U	21	21	U	21
2-Methylnaphthalene	SVOA	19	U	19	20	U	20	19	U	19	19	U	19	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
2-Nitroaniline	SVOA	49	U	49	51	U	51	50	U	50	49	U	49	50	U	50
2-Nitrophenol	SVOA	9.7	U	9.7	10	U	10	9.9	U	9.9	9.8	U	9.8	10	U	10
3,3'-Dichlorobenzidine	SVOA	88	U	88	93	U	93	89	U	89	88	U	88	91	U	91
3+4 Methylphenol (cresol, m+p)	SVOA	32	U	32	34	U	34	33	U	33	32	U	32	33	U	33
3-Nitroaniline	SVOA	71	U	71	75	U	75	73	U	73	71	U	71	74	U	74
4,6-Dinitro-2-methylphenol	SVOA	320	U	320	340	U	340	330	U	330	320	U	320	330	U	330
4-Bromophenylphenyl ether	SVOA	19	U	19	20	U	20	19	U	19	19	U	19	19	U	19
4-Chloro-3-methylphenol	SVOA	64	U	64	68	U	68	66	U	66	65	U	65	67	U	67
4-Chloroaniline	SVOA	80	U	80	84	U	84	81	U	81	80	U	80	83	U	83
4-Chlorophenylphenyl ether	SVOA	20	U	20	22	U	22	21	U	21	21	U	21	21	U	21
4-Nitroaniline	SVOA	71	U	71	75	U	75	72	U	72	71	U	71	73	U	73
4-Nitrophenol	SVOA	95	U	95	100	U	100	96	U	96	95	U	95	98	U	98
Acenaphthene	SVOA	10	U	10	11	U	11	10	U	10	10	U	10	10	U	10
Acenaphthylene	SVOA	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17

Table B-3. 100-N-93 In-Process Sampling Results. (16 Pages)

Sample Number		J1T646			J1T647			J1T648			J1T649			J1T650		
Constituent	Class	11/19/13 11:55			11/19/13 12:00			11/19/13 12:05			11/19/13 12:10			11/19/13 12:15		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Anthracene	SVOA	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17
Benzo(a)anthracene	SVOA	64	J	19	33	J	21	20	U	20	20	U	20	20	U	20
Benzo(a)pyrene	SVOA	19	U	19	21	J	21	20	U	20	20	U	20	20	U	20
Benzo(b)fluoranthene	SVOA	42	J	26	30	JK	27	26	U	26	26	U	26	26	U	26
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16
Benzo(k)fluoranthene	SVOA	39	U	39	41	UK	41	40	U	40	39	U	39	40	U	40
Bis(2-chloro-1-methylethyl)ether	SVOA	22	U	22	24	U	24	23	U	23	22	U	22	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	22	U	22	24	U	24	23	U	23	22	U	22	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16	17	U	17	17	U	17	16	U	16	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	45	U	45	47	U	47	46	U	46	66	J	45	46	U	46
Butylbenzylphthalate	SVOA	42	U	42	44	U	44	43	U	43	42	U	42	43	U	43
Carbazole	SVOA	35	U	35	37	U	37	36	U	36	35	U	35	36	U	36
Chrysene	SVOA	81	J	26	33	J	28	27	U	27	26	U	26	27	U	27
Dibenz[a,h]anthracene	SVOA	19	U	19	20	U	20	19	U	19	19	U	19	19	U	19
Dibenzofuran	SVOA	19	U	19	21	U	21	20	U	20	20	U	20	20	U	20
Diethyl phthalate	SVOA	25	U	25	27	U	27	26	U	26	25	U	25	26	U	26
Dimethyl phthalate	SVOA	52	J	22	69	J	24	23	U	23	22	U	22	39	J	23
Di-n-butylphthalate	SVOA	28	U	28	30	U	30	29	U	29	28	U	28	29	U	29
Di-n-octylphthalate	SVOA	14	U	14	15	U	15	14	U	14	14	U	14	15	U	15
Fluoranthene	SVOA	42	J	35	38	J	37	36	U	36	35	U	35	36	U	36
Fluorene	SVOA	18	U	18	19	U	19	18	U	18	18	U	18	18	U	18
Hexachlorobenzene	SVOA	28	U	28	30	U	30	29	U	29	28	U	28	29	U	29
Hexachlorobutadiene	SVOA	9.7	U	9.7	10	U	10	9.9	U	9.9	9.8	U	9.8	10	U	10
Hexachlorocyclopentadiene	SVOA	49	UX	49	51	U	51	50	U	50	49	U	49	50	U	50
Hexachloroethane	SVOA	21	U	21	22	U	22	21	U	21	21	U	21	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	21	U	21	23	U	23	22	U	22	22	U	22	22	U	22
Isophorone	SVOA	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17
Naphthalene	SVOA	30	U	30	32	U	32	31	U	31	30	U	30	31	U	31
Nitrobenzene	SVOA	21	U	21	23	U	23	22	U	22	22	U	22	22	U	22
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30	32	U	32	31	U	31	30	U	30	31	U	31
N-Nitrosodiphenylamine	SVOA	20	U	20	22	U	22	21	U	21	21	U	21	21	U	21
Pentachlorophenol	SVOA	320	U	320	340	U	340	330	U	330	320	U	320	330	U	330
Phenanthrene	SVOA	28	J	17	17	U	17	17	U	17	17	U	17	17	U	17
Phenol	SVOA	18	U	18	19	U	19	18	U	18	18	U	18	18	U	18
Pyrene	SVOA	31	J	12	34	J	12	12	U	12	12	U	12	12	U	12

Table B-3. 100-N-93 In-Process Sampling Results. (16 Pages)

Sample Number		J1T651			J1T666			J1T667			J1TFN1		
Constituent	Class	11/19/13 12:20			11/19/13 12:25			11/19/13 12:30			03/13/14 02:55		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.8	U	9.8	9.7	U	9.7	10	U	10	10	U	10
Acenaphthylene	PAH	8.8	U	8.8	8.8	U	8.8	9.1	U	9.1	9.1	U	9.1
Anthracene	PAH	3	U	3	3	U	3	3.1	U	3.1	3.1	U	3.1
Benzo(a)anthracene	PAH	3.1	U	3.1	3.1	U	3.1	3.2	U	3.2	3.2	U	3.2
Benzo(a)pyrene	PAH	6.3	U	6.3	6.2	U	6.2	6.5	U	6.5	6.4	U	6.4
Benzo(b)fluoranthene	PAH	4.1	U	4.1	4.1	U	4.1	4.2	U	4.2	4.2	U	4.2
Benzo(ghi)perylene	PAH	7.1	U	7.1	7	U	7	7.3	U	7.3	7.2	U	7.2
Benzo(k)fluoranthene	PAH	3.9	U	3.9	3.8	U	3.8	4	U	4	4	U	4
Chrysene	PAH	4.7	U	4.7	4.7	U	4.7	4.9	U	4.9	4.9	U	4.9
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	13	U	13	13	U	13	13	U	13	13	U	13
Fluorene	PAH	5.2	U	5.2	5.1	U	5.1	5.3	U	5.3	5.3	U	5.3
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12
Naphthalene	PAH	12	U	12	12	U	12	12	U	12	12	U	12
Phenanthrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12
Pyrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12
Aroclor-1016	PCB	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7			
Aroclor-1221	PCB	7.8	U	7.8	7.8	U	7.8	7.8	U	7.8			
Aroclor-1232	PCB	1.9	U	1.9	2	U	2	1.9	U	1.9			
Aroclor-1242	PCB	4.5	U	4.5	4.6	U	4.6	4.5	U	4.5			
Aroclor-1248	PCB	4.5	U	4.5	4.6	U	4.6	4.5	U	4.5			
Aroclor-1254	PCB	2.5	U	2.5	2.5	U	2.5	2.5	U	2.5			
Aroclor-1260	PCB	2.5	U	2.5	2.5	U	2.5	2.5	U	2.5			
Aroclor-1262	PCB												
Aroclor-1268	PCB												
1,2,4-Trichlorobenzene	SVOA	29	U	29	27	U	27	28	U	28	29	U	29
1,2-Dichlorobenzene	SVOA	23	U	23	21	U	21	22	U	22	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	14	U	14	13	U	13	14	U	14	14	U	14
2,4,5-Trichlorophenol	SVOA	10	U	10	9.6	U	9.6	10	U	10	10	U	10
2,4,6-Trichlorophenol	SVOA	10	U	10	9.6	U	9.6	10	U	10	10	U	10
2,4-Dichlorophenol	SVOA	10	U	10	9.6	U	9.6	10	U	10	10	U	10
2,4-Dimethylphenol	SVOA	68	U	68	63	U	63	66	U	66	67	U	67
2,4-Dinitrophenol	SVOA	340	U	340	320	U	320	340	U	340	340	U	340
2,4-Dinitrotoluene	SVOA	68	U	68	63	U	63	66	U	66	67	U	67
2,6-Dinitrotoluene	SVOA	29	U	29	27	U	27	28	U	28	29	U	29
2-Chloronaphthalene	SVOA	10	U	10	9.6	U	9.6	10	U	10	10	U	10
2-Chlorophenol	SVOA	22	U	22	20	U	20	21	U	21	21	U	21
2-Methylnaphthalene	SVOA	20	U	20	18	U	18	19	U	19	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	12	U	12	13	U	13	13	U	13
2-Nitroaniline	SVOA	51	U	51	48	U	48	50	U	50	51	U	51
2-Nitrophenol	SVOA	10	U	10	9.6	U	9.6	10	U	10	10	U	10
3,3'-Dichlorobenzidine	SVOA	92	U	92	86	U	86	91	U	91	92	U	92
3+4 Methylphenol (cresol, m+p)	SVOA	34	U	34	32	U	32	33	U	33	34	U	34
3-Nitroaniline	SVOA	75	U	75	70	U	70	73	U	73	74	U	74
4,6-Dinitro-2-methylphenol	SVOA	340	U	340	320	U	320	330	U	330	340	U	340
4-Bromophenylphenyl ether	SVOA	20	U	20	18	U	18	19	U	19	19	U	19
4-Chloro-3-methylphenol	SVOA	68	U	68	63	U	63	66	U	66	67	U	67
4-Chloroaniline	SVOA	84	U	84	79	U	79	82	U	82	83	U	83
4-Chlorophenylphenyl ether	SVOA	22	U	22	20	U	20	21	U	21	21	U	21
4-Nitroaniline	SVOA	74	U	74	70	U	70	73	U	73	74	U	74
4-Nitrophenol	SVOA	100	U	100	93	U	93	98	U	98	99	U	99
Acenaphthene	SVOA	11	U	11	9.9	U	9.9	10	U	10	10	U	10
Acenaphthylene	SVOA	17	U	17	16	U	16	17	U	17	17	U	17

Table B-3. 100-N-93 In-Process Sampling Results. (16 Pages)

Sample Number		J1T651			J1T666			J1T667			J1TFN1		
Constituent	Class	11/19/13 12:20			11/19/13 12:25			11/19/13 12:30			03/13/14 02:55		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Anthracene	SVOA	17	U	17	16	U	16	17	U	17	17	U	17
Benzo(a)anthracene	SVOA	21	U	21	19	U	19	20	U	20	20	U	20
Benzo(a)pyrene	SVOA	21	U	21	19	U	19	20	U	20	20	U	20
Benzo(b)fluoranthene	SVOA	27	U	27	25	U	25	26	U	26	27	U	27
Benzo(ghi)perylene	SVOA	16	U	16	15	U	15	16	U	16	16	U	16
Benzo(k)fluoranthene	SVOA	41	U	41	38	U	38	40	U	40	41	U	41
Bis(2-chloro-1-methylethyl)ether	SVOA	24	U	24	22	U	22	23	U	23	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	24	U	24	22	U	22	23	U	23	23	U	23
Bis(2-chloroethyl) ether	SVOA	17	U	17	16	U	16	17	U	17	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	47	U	47	44	U	44	46	U	46	47	U	47
Butylbenzylphthalate	SVOA	44	U	44	41	U	41	43	U	43	44	U	44
Carbazole	SVOA	37	U	37	35	U	35	36	U	36	37	U	37
Chrysene	SVOA	28	U	28	26	U	26	27	U	27	28	U	28
Dibenz[a,h]anthracene	SVOA	20	U	20	18	U	18	19	U	19	19	U	19
Dibenzofuran	SVOA	21	U	21	19	U	19	20	U	20	20	U	20
Diethyl phthalate	SVOA	27	U	27	25	U	25	26	U	26	26	U	26
Dimethyl phthalate	SVOA	24	U	24	22	U	22	53	J	23	23	U	23
Di-n-butylphthalate	SVOA	30	U	30	28	U	28	29	U	29	30	U	30
Di-n-octylphthalate	SVOA	15	U	15	14	U	14	14	U	14	15	U	15
Fluoranthene	SVOA	37	U	37	35	U	35	36	U	36	37	U	37
Fluorene	SVOA	18	U	18	17	U	17	18	U	18	18	U	18
Hexachlorobenzene	SVOA	30	U	30	28	U	28	29	U	29	30	U	30
Hexachlorobutadiene	SVOA	10	U	10	9.6	U	9.6	10	U	10	10	U	10
Hexachlorocyclopentadiene	SVOA	51	U	51	48	U	48	50	U	50	51	U	51
Hexachloroethane	SVOA	22	U	22	20	U	20	21	U	21	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	23	U	23	21	U	21	22	U	22	22	U	22
Isophorone	SVOA	17	U	17	16	U	16	17	U	17	17	U	17
Naphthalene	SVOA	32	U	32	30	U	30	31	U	31	32	U	32
Nitrobenzene	SVOA	23	U	23	21	U	21	22	U	22	22	U	22
N-Nitroso-di-n-dipropylamine	SVOA	32	U	32	30	U	30	31	U	31	32	U	32
N-Nitrosodiphenylamine	SVOA	22	U	22	20	U	20	21	U	21	21	U	21
Pentachlorophenol	SVOA	340	U	340	320	U	320	330	U	330	340	U	340
Phenanthrene	SVOA	17	U	17	16	U	16	17	U	17	17	U	17
Phenol	SVOA	18	U	18	17	U	17	18	U	18	18	U	18
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12

Table B-4. Asbestos Results All Samples. (2 Pages)

HEIS Number	Sample Date	Sample Description (layer)	Total Percent Asbestos	Chrysotyle	Amosite
J1D4B2	1/20/2011	Ground, dark brown	ND		
J1D4B3	1/20/2011	Ground, dark brown	ND		
J1D4B4	1/20/2011	Ground, brown	ND		
J1D4C1	1/20/2011	Ground, charcoal grey	ND		
J1D4B5	1/20/2011	Ground, dark brown	ND		
J1D4C2	1/20/2011	Mat, dark brown	17	17	
J1D4B6	1/20/2011	Ground, rose, brown	ND		
J1D4B8	1/20/2011	Ground, rose, brown	ND		
J1DW89	1/24/2011	Soil, brown	ND		
J1DW90	1/24/2011	Ground, light brown	ND		
J1D4B7	1/20/2011	Ground, dark brown, red-brown	ND		
J1RJT3	3/28/2013	Layer 1 - soil mix, multi-brown	15	6	9
		Layer 2 - rusty red, rock	14	7	7
		Layer 3 - cloth	74	70	4
J1RJT4	3/28/2013	Soil mix, brown	2	1	1
J1RJT5	3/28/2013	Soil mix, brown	4	2	2
J1RK29	4/2/2013	Layer 1 - paper, white/pink	ND		
		Layer 2 - tar/mastic, black	ND		
J1RK30	4/2/2013	Tar coated fibers	ND		
J1RK31	4/2/2013	Tar paper, black	ND		
J1RP79	6/17/2013	Rocky sand, light brown/black	ND		
J1RP80	6/17/2013	Soil, pale brown	ND		
J1RP81	6/17/2013	Rock soil, grey, tan	ND		
J1RP82	6/17/2013	Soil, tan	ND		
J1RP83	6/17/2013	Fine sand, light brown	ND		
J1RXN8	8/28/2013	Rocky sand, tan, brown	ND		
J1RXN9	8/28/2013	Dirt, dark brown	ND		
J1RXP0	8/28/2013	Soil, brown	16	16	
J1T0W3	9/10/2013	Rocky soil, brown	3	1	2
J1T0W4	9/10/2013	Rocky soil, brown	ND		
J1T0W5	9/10/2013	Layer 1 - fiberous mat, white	15		15
		Layer 2 - soil, brown	7		7
J1T0W6	9/10/2013	Dirt, brown	10	5	5
J1T0W7	9/10/2013	Rocky soil, brown	ND		
J1T299	9/26/2013	Rocky soil, tan	ND		
J1T2C0	9/26/2013	Rocky sand, tan	ND		
J1T2C1	9/26/2013	Rocky snd, brown	ND		
J1T2C2	9/26/2013	Sand, brown	ND		
J1T2C3	9/26/2013	Rock soil, tan	2		2
J1T2C4	9/26/2013	Soil, light brown	ND		
J1T2C5	9/26/2013	Soil, tank	ND		
J1T2C6	9/26/2013	Rocky soil, tan	4		4
J1T2C7	9/26/2013	Rocky soil, brown	ND		
J1T2C8	9/26/2013	Rocky sand, grey, tan	ND		
J1T2C9	9/26/2013	Rocky sand, brown	ND		
J1T2D0	9/26/2013	Sand, brown	ND		
J1T2D1	9/26/2013	Soil, dark brown, black	ND		
J1T2D2	9/26/2013	Dirt, brown	ND		
J1T339	10/8/2013	Rocky sand, black, tank	ND		
J1T340	10/8/2013	Sand, brown	ND		
J1T341	10/8/2013	Rocky sand, brown	ND		
J1T342	10/8/2013	Rocky sand, dark brown, tan	ND		

Table B-4. Asbestos Results All Samples. (2 Pages)

HEIS Number	Sample Date	Sample Description (layer)	Total Percent Asbestos	Chrysotyle	Amosite
J1T343	10/8/2013	Rocky soil, dark brown, tan	ND		
J1T344	10/8/2013	Rocky sand, dark brown	ND		
J1T345	10/8/2013	Rocky sand, tan, dark brown	ND		
J1T346	10/8/2013	Rocky sand, brown	ND		
J1T347	10/8/2013	Sand, dark brown, tan	ND		
J1T348	10/8/2013	Fine sand, light brown	ND		
J1T657	11/19/2013	Soil, brown	1	1	
J1T658	11/19/2013	Layer 1 - soil, brown	1	1	
		Layer 2 - mat, off-white	40	40	
J1T659	11/19/2013	Rocky sand, brown/dark brown	5		5
J1T660	11/19/2013	Rocky soil, brown	ND		
J1T661	11/19/2013	Sand brown	ND		
J1T662	11/19/2013	Rocky soil, dark brown, tan	ND		
J1T663	11/19/2013	Soil, tan, dark brown	ND		
J1T664	11/19/2013	Rocky soil, brown	ND		
J1T665	11/19/2013	Rocky soil, brown, clear	ND		
J1T668	11/19/2013	Layer 1 - sand, brown	ND		
		Laye 2 - wall, grey	ND		
J1T669	11/19/2013	Layer 1 - rocky sand, tan	8		8
		Layer 2 - insulation, off-white	40	40	
J1TFH8	3/5/2014	Sand, tan	ND		
J1TFH9	3/5/2014	Sand, tan	ND		
J1TFJ0	3/5/2014	Rocky dirt, black, tan	ND		
J1TFJ1	3/5/2014	Sand, tan	ND		
J1TFJ2	3/5/2014	Rocky sand, brown	ND		
J1TFJ3	3/5/2014	Sand, brown	ND		
J1TFN2	3/13/2014	Rocky dirt, grey, tan	ND		
J1TFN3	3/13/2014	Rocky dirt, brown, grey	ND		
J1TFN4	3/13/2014	Rocky sand, brown, grey	ND		
J1TFN5	3/13/2014	Rocky sand, brown	ND		
J1TFN6	3/13/2014	Rocky dirt, brown, grey	ND		
J1TFN7	3/13/2014	Rocky sand, brown	ND		
J1TFN8	3/13/2014	Sand, brown	ND		
J1TFN9	3/13/2014	Rocky sand, brown	ND		
J1TFP0	3/13/2014	Rocky sand, brown	ND		
J1TFP1	3/13/2014	Rocky silt, light brown	ND		
J1TFP2	3/13/2014	Sand, brown, tan	ND		
J1TFP3	3/13/2014	Rocky dirt, brown, grey	ND		

APPENDIX C

CALCULATIONS

APPENDIX C

CALCULATION BRIEF

The calculations provided in this appendix are copies of originals that are kept in the active Washington Closure Hanford project files and are available upon request. When the project is completed, the file will be stored in a U.S. Department of Energy, Richland Operations Office, repository. These calculations has been prepared in accordance with ENG-1, *Engineering Services*, ENG-1-4.5, "Project Calculations," Washington Closure Hanford, Richland, Washington. The calculations provided in this appendix include the following:

100-N-93 Waste Site Cleanup Verification 95% UCL Calculations, 0100N-CA-V0273, Rev. 0, Washington Closure Hanford, Richland, Washington.

100-N-93 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations, 0100N-CA-V0274, Rev. 0, Washington Closure Hanford, Richland, Washington.

100-N-93 Waste Site Hazard Quotient and Carcinogenic Risk Calculation for Protection of Groundwater, 0100N-CA-V0275, Rev. 0, Washington Closure Hanford, Richland, Washington.

DISCLAIMER FOR CALCULATIONS

The calculations that are provided in this appendix have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

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CALCULATION COVER SHEET

Project Title: 100-N Field Remediation **Job No. 14655**

Area: 100-N

Discipline: Environmental *Calculation No: 0100N-CA-V0273

Subject: 100-N-93 Waste Site Cleanup Verification 95% UCL Calculations

Computer Program: Excel Program No: Excel 2010

The attached calculations have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Sheets = 12 Attm. 1 = 12 Total = 25	J. D. Skoglie	I. B. Berezovskiy	H. M. Sulloway	D. F. Obenauer	6/16/14

SUMMARY OF REVISION

WCH-DE-018 (05/08/2007) *Obtain Calc. No. from Document Control and Form from Intranet

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie	**Date** 06/10/14	**Calc. No.** 0100N-CA-V0273	**Rev. No.** 0
Project 100-N Field Remediation	**Job No.** 14655	**Checked** I. B. Berezovskiy	**Date** 06/10/14
Subject 100-N-93 Waste Site Cleanup Verification 95% UCL Calculations			**Sheet No.** 1 of 12

Summary

Purpose:
Calculate the 95% upper confidence limit (UCL) values to evaluate compliance with cleanup standards for the subject site. Also, perform the *Washington Administrative Code* (WAC) 173-340-740(7)(e) Model Toxics Control Act (MTCA) 3-part test for nonradionuclide analytes and calculate the relative percent difference (RPD) for primary-duplicate sample pairs for each contaminant of concern (COC) and contaminant of potential concern (COPC), as necessary.

Table of Contents:
Sheets 1 to 5 - Calculation Sheet Summary
Sheets 6 to 8 - Calculation Sheet Verification Data - Statistical and Maximum Calculations
Sheets 9 to 10 - Ecology Software (MTCAStat) Results
Sheet 11 to 12 - Calculation Sheet Duplicate-Split Analysis
Attachment 1 - 100-N-93, Verification Sampling Results (12 sheets)

Given/References:
1) Sample Results (Attachment 1).
2) DOE-RL, 2006, 100-N Area Sampling and Analysis Plan for CERCLA Waste Sites, DOE/RL-2005-92, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
3) DOE-RL, 2013, Remedial Design Report/Remedial Action Work Plan for the 100-N Area, DOE/RL-2005-93, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
4) Ecology, 1992, Statistical Guidance for Ecology Site Managers, Publication #92-54, Washington Department of Ecology, Olympia, Washington.
5) Ecology, 1993, Statistical Guidance for Ecology Site Managers, Supplement S-6, Analyzing Site or Background Data with Below-detection Limit or Below-PQL Values (Censored Data Sets), Publication #92-54, Washington Department of Ecology, Olympia, Washington.
6) Ecology, 2011, Cleanup Levels and Risk Calculations (CLARC) Database, Washington State Department of Ecology, Olympia, Washington, <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.
7) EPA, 1989, Risk Assessment Guidance for Superfund: Volume 1, Human Health Evaluation Manual, Part A; Interim Final, EPA/540/1-89/002, U.S. Environmental Protection Agency, Washington, D. C.
8) WAC 173-340, 1996, "Model Toxic Control Act - Cleanup," Washington Administrative Code.

Solution:
Calculation methodology is described in Ecology Pub. #92-54 (Ecology 1992, 1993), below, and in the RDR/RAWP (DOE-RL 2013). Use data from attached worksheets to perform the 95% UCL calculation for each analyte, the WAC 173-340-740(7)(e) 3-part test for nonradionuclides, and the RPD calculations for each COC/COPC. The hazard quotient and carcinogenic risk calculations are located in a separate calculation brief as an appendix to the Remaining Sites Verification Package (RSVP).

Calculation Description:
The subject calculations were performed on statistical data from soil verification samples (Attachment 1) from the 100-N-84:5 subsite. The data were entered into an EXCEL 2010 spreadsheet and calculations performed by using the built-in spreadsheet functions and/or creating formulae within the cells. The statistical evaluation of data for use in accordance with the RDR/RAWP (DOE-RL 2013) is documented by this calculation. Duplicate RPD results are used in evaluation of data quality within the RSVP for this site.

Methodology:
The 100-N-93 waste site underwent statistical and focused sampling. The 100-N-93 is comprised of one decision unit; excavation (EXC). In addition, eight focused samples were collected.

Analytical results for all sampling locations are summarized in the tables provided on sheets 4 and 5. Further information of the sample data quality is presented in the data quality assessment section of the associated RSVP.

Washington Closure Hanford **CALCULATION SHEET**

Originator J. D. Skoglie	**Date** 06/10/14	**Calc. No.** 0100N-CA-V0273	**Rev. No.** 0
Project 100-N Field Remediation	**Job No.** 14655	**Checked** I. B. Berezovskiy	**Date** 06/10/14
Subject 100-N-93 Waste Site Cleanup Verification 95% UCL Calculations			**Sheet No.** 2 of 12

Summary (continued)

Methodology, continued:

For nonradioactive analytes with ≤50% of the data below detection limits, the statistical value calculated to evaluate the effectiveness of cleanup is the 95% UCL. For nonradioactive analytes with >50% of the data below detection limits, as determined by direct inspection of the sample results (Attachment 1), the maximum detected value for the data set (which includes primary and duplicate samples) is used instead of the 95% UCL, and no further calculations are performed for those data sets. For convenience, these maximum detected values are included in the summary tables that follow. The 95% UCL was not calculated for data sets with no reported detections. Calculated cleanup levels are not available in (Ecology 2011) under WAC 173-340-740(3) for calcium, magnesium, potassium, silicon, and sodium. The EPA's *Risk Assessment Guidance for Superfund* (EPA 1989) recommends that aluminum and iron not be considered in site risk evaluations. Therefore, aluminum, calcium, iron, magnesium, potassium, silicon, and sodium are not considered site COCs/COPCs and are also not included in these calculations.

The 95% UCL values were not calculated for potassium-40, radium-226, radium-228, thorium-228, and thorium-232 based on natural occurrence at the Hanford Site.

All nonradionuclide data reported as being undetected are set to ½ the detection limit value for calculation of the statistics (Ecology 1993). For the statistical evaluation of duplicate sample pairs, the samples are averaged before being included in the data set, after adjustments for censored data as described above. For radionuclide data, calculation of the statistics is done using the reported value. In cases where the laboratory does not report a value below the minimum detectable activity (MDA), half of the MDA is used in the calculation. For the statistical evaluation of duplicate sample pairs, the samples are averaged before being included in the data set, after adjustments for censored data as described above.

For nonradionuclides, the WAC 173-340 statistical guidance suggests that a test for distributional form be performed on the data and the 95% UCL calculated on the appropriate distribution using Ecology software. For nonradionuclide small data sets ($n < 10$), the calculations are performed assuming nonparametric distribution, so no tests for distribution are performed. For nonradionuclide data sets of ten or greater, as for the subject site, distributional testing is done using Ecology's MTCAStat software (Ecology 1993). Due to differences in addressing censored data between the RDR/RAWP (DOE-RL 2013) and MTCAStat coding and due to a limitation in the MTCAStat coding (no direct capability to address variable quantitation limits within a data set), substitutions for censored data are performed before software input and the resulting data set treated as uncensored.

The WAC 173-340-740(7)(e) 3-part test is performed for nonradionuclide analytes only and determines if:
1) the 95% UCL exceeds the most stringent cleanup limit for each COPC/COC,
2) greater than 10% of the raw data exceed the most stringent cleanup limit for each COPC/COC,
3) the maximum value of the raw data set exceeds two times the most stringent cleanup limit for each COPC/COC.

The RPD is calculated when both the primary value and either the duplicate or split value for a given analyte are above detection limits and are greater than 5 times the target detection limit (TDL). The TDL is a laboratory detection limit pre-determined for each analytical method and is listed in Table 2-1 of the SAP (DOE-RL 2006) for certain constituents. All other constituents will have their own pre-determined TDL's based on the laboratory and method used. Where direct evaluation of the attached sample data showed that a given analyte was not detected in the primary and/or duplicate sample, further evaluation of the RPD value was not performed. The RPD calculations use the following formula:

$$RPD = [\,|M-S|/((M+S)/2)]*100$$

where, M = Main Sample Value S = Split (or duplicate) Sample Value

For quality assurance/quality control (QA/QC) duplicate RPD calculations, a value less than 30% indicates the data compare favorably. If the RPD is greater than 30%, further investigation regarding the usability of the data is performed. To assist in the identification of anomalous sample pairs, when an analyte is detected in the primary or duplicate/split sample, but was quantified at less than 5 times the TDL in one or both samples, an additional parameter is evaluated. In this case, if the difference between the primary and duplicate/split result exceeds a control limit of 2 times the TDL, further assessment regarding the usability of the data is performed. Additional

Washington Closure Hanford **CALCULATION SHEET**

Originator J. D. Skoglie **Date** 06/10/14 **Calc. No.** 0100N-CA-V0273 **Rev. No.** 0
Project 100-N Field Remediation **Job No.** 14655 **Checked** I. B. Berezovskiy **Date** 06/10/14
Subject 100-N-93 Waste Site Cleanup Verification 95% UCL Calculations **Sheet No.** 3 of 12

Summary (continued)

QUALIFIER LIST

B = estimated result. Result is less than the RL, but greater than MDL.
C = the analyte was detected in both the sample and associated QC blank, and the sample concentration was ≤ 5X the blank concentration.
J = estimate
M = sample duplicate precision not met
N = recovery exceeds upper or lower control limits.
U = undetected
X = serial dilution in the analytical batch indicates that physical and chemical interferences are present (metals).

ACRONYM LIST

-- = not applicable
DE = direct exposure
EXC = excavation
FS = focused sample
GW = groundwater
MTCA = *Model Toxics Control Act*
PAH = polycyclic aromatic hydrocarbons
PQL = practical quantitation limit
Q = qualifier
QA/QC = quality assurance/quality control
RAG = remedial action goal
RDR/RAWP = remedial design report/remedial action work plan
RESRAD = RESidual RADioactivity (dose model)
RPD = relative percent difference
RSVP = remaining sites verification package
SAP = sampling and analysis plan
TDL = target detection limit
UCL = upper confidence limit
WAC = Washington Administrative Code

Washington Closure Hanford **CALCULATION SHEET**

Originator J. D. Skoglie **Date** 06/10/14 **Calc. No.** 0100N-CA-V0273 **Rev. No.** 0
Project 100-N Field Remediation **Job No.** 14655 **Checked** I. B. Berezovskiy **Date** 06/10/14
Subject 100-N-93 Waste Site Cleanup Verification 95% UCL Calculations **Sheet No.** 4 of 12

Summary (continued)

Results:
The results presented in the tables that follow include the summary of the 95% UCL calculations and maximum results for the excavation, focused samples, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations are for use in risk analysis and the RSVP for this subsite.

Results Summary - Excavation and Focused Samples [a]

Analyte	Excavation		Focused Samples 1-8	Units
	95% UCL Result	Maximum Result	Maximum Result	
Arsenic	3.0	--	4.1	mg/kg
Barium	56.0	--	64.4	mg/kg
Beryllium	0.25	--	0.33	mg/kg
Cadmium	--	0.10	0.11	mg/kg
Chromium	11.1	--	16.4	mg/kg
Cobalt	7.5	--	8.7	mg/kg
Copper	18.2	--	20.1	mg/kg
Lead	3.5	--	4.0	mg/kg
Manganese	276	--	315	mg/kg
Molybdenum	--	0.39	0.88	mg/kg
Nickel	11.6	--	15.5	mg/kg
Vanadium	43.5	--	55.0	mg/kg
Zinc	36.0	--	39.6	mg/kg
TPH - Diesel Range EXT	--	10	14	mg/kg
TPH - Diesel Range	--	4.2	6.4	mg/kg
Benzo(a)anthracene (Method 8270)	--	--	0.029	mg/kg
Benzo(a)pyrene (Method 8270)	--	--	0.021	mg/kg
Chrysene (Method 8270)	--	--	0.036	mg/kg
Chrysene (Method 8310)	--	--	0.011	mg/kg
Dimethyl phthalate	--	0.035	--	mg/kg
Fluoranthene (Method 8270)	--	--	0.053	mg/kg
Fluoranthene (Method 8310)	--	--	0.017	mg/kg
Phenanthrene (Method 8270)	--	--	0.038	mg/kg
Pyrene (Method 8270)	--	--	0.059	mg/kg
Pyrene (Method 8310)	--	--	0.020	mg/kg

3-Part Test Evaluation:		**EXC**
95% UCL or maximum [a] > Cleanup Limit?	NA	NO
> 10% above Cleanup Limit?	NA	NO
Any sample > 2x Cleanup Limit?	NA	NO

[a] The 95% UCL result or maximum value, depending on data censorship, as described in the methodology section.

Washington Closure Hanford

CALCULATION SHEET

Originator J. D. Skoglie **Date** 06/10/14 **Calc. No.** 0100N-CA-V0273 **Rev. No.** 0
Project 100-N Field Remediation **Job No.** 14655 **Checked** I. B. Berezovskiy **Date** 06/10/14
Subject 100-N-93 Waste Site Cleanup Verification 95% UCL Calculations **Sheet No.** 5 of 12

Summary (continued)

Results:
The results presented in the tables that follow include the summary of the 95% UCL calculations and maximum results for the excavation area, focused samples, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations are for use in risk analysis and the RSVP for this subsite.

Relative Percent Difference Results and QA/QC Analysis[a]

Analyte	EXC		FS	
	Duplicate	Split	Duplicate	Split
Aluminum	11.2%	15.6%	0.9%	10.6%
Barium	9.9%	9.7%	2.8%	0.3%
Calcium	20.1%	11.9%	5.7%	1.2%
Chromium	9.6%	6.1%	2.5%	13.4%
Copper	9.4%	13.5%	5.2%	2.6%
Iron	9.7%	8.8%	0.0%	11.9%
Magnesium	10.3%	14.4%	1.0%	9.5%
Manganese	12.1%	7.0%	3.0%	1.7%
Silicon	21.6%	***35.3%***	12.6%	***120.1%***
Vanadium	10.5%	11.6%	0.3%	15.5%
Zinc	7.5%	1.5%	0.8%	4.1%

[a]RPD listed where result produced, based on criteria. If RPD not required, no value is listed. The significance of the reported RPD values, including values greater than 30%, and greater than 35% for splits, is addressed in the data quality assessment section of the RSVP.

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-N Field Remediation
Subject 100-N-93 Waste Site Cleanup Verification 95% UCL Calculations

Date 06/10/14
Job No. 14655

Calc. No. 0100N-CA-V0273
Checked T. B. Berezovskiy

Rev. No. 0
Date 06/10/14
Sheet No. 6 of 12

1 **100-N-93 Waste Site Statistical Calculations**
2 **Verification Data - Excavation (EXC)**

3	Sample	Sample	Sample	Arsenic			Barium			Beryllium			Chromium			Cobalt			Copper			Lead			Manganese		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
5	EXC-7	J1TPL4	5/15/14	3.3		0.67	66.7		0.078	0.23		0.034	14.2		0.059	5.9	X	0.10	19.0		0.22	3.1		0.28	281		0.10
6	Duplicate of J1TPL4	J1TPM0	5/15/14	3.1		0.64	60.4		0.074	0.20		0.032	12.9		0.057	5.4	X	0.098	17.3		0.21	2.9		0.26	249		0.098
7	EXC-1	J1TPK8	5/15/14	2.2		0.57	36.7		0.065	0.19		0.028	8.9		0.050	4.9	X	0.086	12.7		0.19	2.4		0.23	223		0.086
8	EXC-2	J1TPK9	5/15/14	1.2		0.65	40.6		0.075	0.21		0.032	2.9		0.057	7.9	X	0.098	16.5		0.21	2.0		0.26	244		0.098
9	EXC-3	J1TPL0	5/15/14	1.5		0.62	39.2		0.071	0.23		0.031	3.4		0.054	8.0	X	0.093	16.9		0.20	1.9		0.25	268		0.093
10	EXC-4	J1TPL1	5/15/14	3.7		0.66	50.1		0.078	0.25		0.033	11.7		0.058	7.6	X	0.10	17.8		0.22	4.0		0.27	296		0.10
11	EXC-5	J1TPL2	5/15/14	1.5		0.57	44.2		0.066	0.21		0.029	4.3		0.050	7.9	X	0.087	16.1		0.19	2.3		0.23	259		0.087
12	EXC-6	J1TPL3	5/15/14	3.9		0.64	72.4		0.074	0.26		0.032	14.9		0.057	5.7	X	0.098	16.4		0.21	4.2		0.26	296		0.098
13	EXC-8	J1TPL5	5/15/14	2.4		0.59	37.9		0.068	0.22		0.030	4.6		0.052	7.0	X	0.090	18.6		0.19	2.1		0.24	217		0.090
14	EXC-9	J1TPL6	5/15/14	3.1		0.61	61.5		0.070	0.34		0.030	7.9		0.053	8.4	X	0.092	21.5		0.20	4.7		0.25	304		0.092
15	EXC-10	J1TPL7	5/15/14	1.8		0.67	35.7		0.077	0.20		0.033	6.8		0.059	6.0	X	0.10	14.8		0.22	2.4		0.27	246		0.10
16	EXC-11	J1TPL8	5/15/14	2.0		0.58	52.6		0.067	0.23		0.029	6.8		0.051	6.5	X	0.088	16.6		0.19	2.7		0.24	251		0.088
17	EXC-12	J1TPL9	5/15/14	1.5		0.60	52.7		0.069	0.24		0.030	6.9		0.053	6.5	X	0.091	17.9		0.20	3.0		0.24	248		0.091

18
19 **Statistical Computation Input Data**

20	Sample	Sample	Sample	Arsenic	Barium	Beryllium	Chromium	Cobalt	Copper	Lead	Manganese
21	Area	Number	Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
22	EXC-7	J1TPL4/ J1TPM4	5/15/14	3.2	63.6	0.22	13.6	5.7	18.2	3.0	265
23	EXC-1	J1TPK8	5/15/14	2.2	36.7	0.19	8.9	4.9	12.7	2.4	223
24	EXC-2	J1TPK9	5/15/14	1.2	40.6	0.21	2.9	7.9	16.5	2.0	244
25	EXC-3	J1TPL0	5/15/14	1.5	39.2	0.23	3.4	8.0	16.9	1.9	268
26	EXC-4	J1TPL1	5/15/14	3.7	50.1	0.25	11.7	7.6	17.8	4.0	296
27	EXC-5	J1TPL2	5/15/14	1.5	44.2	0.21	4.3	7.9	16.1	2.3	259
28	EXC-6	J1TPL3	5/15/14	3.9	72.4	0.26	14.9	5.7	16.4	4.2	296
29	EXC-8	J1TPL5	5/15/14	2.4	37.9	0.22	4.6	7.0	18.6	2.1	217
30	EXC-9	J1TPL6	5/15/14	3.1	61.5	0.34	7.9	8.4	21.5	4.7	304
31	EXC-10	J1TPL7	5/15/14	1.8	35.7	0.20	6.8	6.0	14.8	2.4	246
32	EXC-11	J1TPL8	5/15/14	2.0	52.6	0.23	6.8	6.5	16.6	2.7	251
33	EXC-12	J1TPL9	5/15/14	1.5	52.7	0.24	6.9	6.5	17.9	3.0	248

34
35 **Statistical Computations**

36		Arsenic		Barium		Beryllium		Chromium		Cobalt		Copper		Lead		Manganese	
37	95% UCL based on	Large data set (n ≥ 10), use MTCAStat lognormal distribution.		Large data set (n ≥ 10), use MTCAStat lognormal distribution.		Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic		Large data set (n ≥ 10), use MTCAStat lognormal distribution.		Large data set (n ≥ 10), use MTCAStat lognormal distribution.		Large data set (n ≥ 10), use MTCAStat lognormal distribution.		Large data set (n ≥ 10), use MTCAStat lognormal distribution.		**Large data set (n ≥ 10), use MTCAStat lognormal distribution.**	
38	N	12		12		12		12		12		12		12		12	
39	% < Detection limit	0%		0%		0%		0%		0%		0%		0%		0%	
40	mean	2.3		48.9		0.29		7.7		6.6		17.0		2.9		260	
41	st. dev.	0.93		12.0		0.039		3.9		1.1		2.1		0.93		28.1	
42	95% UCL on mean	3.0		56.0		0.25		11.1		7.5		18.2		3.5		276	
43	max value	3.9		72.4		0.34		14.9		8.4		21.5		4.7		304	
44	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)**	20	DE, GW & River Protection	200	GW Protection	1.51	GW & River Protection	18.5	GW & River Protection	32	GW Protection	22.0	River Protection	10.2	GW & River Protection	512	GW Protection
45	**WAC 173-340 3-PART TEST**																
46	95% UCL > Cleanup Limit?	NA		NA		NA		NA		NA		NA		NA		NA	
47	> 10% above Cleanup Limit?	NA		NA		NA		NA		NA		NA		NA		NA	
48	Any sample > 2X Cleanup Limit?	NA		NA		NA		NA		NA		NA		NA		NA	
49	**WAC 173-340 Compliance?**	Because all values are below background (6.5 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (132 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (1.51 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (18.5 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (15.7 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are below background (22.0 mg/kg) the WAC 173-340 3-part test is not required.		Because all values are at or below background (10.2 mg/kg) the WAC 173-340 3-part test is not required.		**Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required.**	

CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-N Field Remediation
Subject 100-N-93 Waste Site Cleanup Verification 95% UCL Calculations

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100-N-93 Subsite Statistical Calculations

Verification Data - Excavation (EXC)

Sample Area	Sample Number	Sample Date	Nickel mg/kg	Nickel Q	Nickel PQL	Vanadium mg/kg	Vanadium Q	Vanadium PQL	Zinc mg/kg	Zinc Q	Zinc PQL
EXC-7	J1TPL4	5/15/14	13.6		0.13	34.0		0.096	33.4	X	0.41
Duplicate of J1TPL4	J1TPM0	5/15/14	12.2		0.12	30.6		0.092	31.0	X	0.39
EXC-1	J1TPK8	5/15/14	9.8		0.11	35.9		0.081	27.9	X	0.34
EXC-2	J1TPK9	5/15/14	6.7		0.12	45.1		0.092	35.8	X	0.39
EXC-3	J1TPL0	5/15/14	6.7		0.11	47.1		0.088	33.1	X	0.37
EXC-4	J1TPL1	5/15/14	14.6		0.12	45.8		0.094	38.0	X	0.40
EXC-5	J1TPL2	5/15/14	7.5		0.11	36.7		0.081	33.4	X	0.34
EXC-6	J1TPL3	5/15/14	13.6		0.12	28.7		0.092	35.1	X	0.39
EXC-8	J1TPL5	5/15/14	7.6		0.11	36.5		0.084	31.9	X	0.36
EXC-9	J1TPL6	5/15/14	10.7		0.11	43.8		0.087	40.5	X	0.37
EXC-10	J1TPL7	5/15/14	9.4		0.12	41.1		0.095	31.1	X	0.40
EXC-11	J1TPL8	5/15/14	10.9		0.11	44.7		0.083	34.6	X	0.35
EXC-12	J1TPL9	5/15/14	8.1		0.11	46.4		0.085	36.1	X	0.36

Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Nickel mg/kg	Vanadium mg/kg	Zinc mg/kg
EXC-7	J1TPL4/ J1TPM4	5/15/14	12.9	32.3	32.2
EXC-1	J1TPK8	5/15/14	9.8	35.9	27.9
EXC-2	J1TPK9	5/15/14	6.7	45.1	35.8
EXC-3	J1TPL0	5/15/14	6.7	47.1	33.1
EXC-4	J1TPL1	5/15/14	14.6	45.8	38.0
EXC-5	J1TPL2	5/15/14	7.5	36.7	33.4
EXC-6	J1TPL3	5/15/14	13.6	28.7	35.1
EXC-8	J1TPL5	5/15/14	7.6	36.5	31.9
EXC-9	J1TPL6	5/15/14	10.7	43.8	40.5
EXC-10	J1TPL7	5/15/14	9.4	41.1	31.1
EXC-11	J1TPL8	5/15/14	10.9	44.7	34.6
EXC-12	J1TPL9	5/15/14	8.1	46.4	36.1

Statistical Computations

	Nickel	Vanadium	Zinc
95% UCL based on	Large data set (n ≥ 10), use MTCAStat lognormal distribution.	Large data set (n ≥ 10), use MTCAStat normal distribution.	Large data set (n ≥ 10), use MTCAStat lognormal distribution
N	12	12	12
% < Detection limit	0%	0%	0%
mean	9.9	40.3	34.1
st. dev.	2.7	6.1	3.3
95% UCL on mean	11.6	43.5	35.0
max value	14.6	47.1	40.5
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	19.1 GW Protection	85.1 GW Protection	67.8 River Protection
WAC 173-340 3-PART TEST			
95% UCL > Cleanup Limit?	NA	NA	NA
> 10% above Cleanup Limit?	NA	NA	NA
Any sample > 2X Cleanup Limit?	NA	NA	NA
WAC 173-340 Compliance?	Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (85.1 mg/kg) the WAC 173-340 3-part test is not required.	Because all values are below background (67.8 mg/kg) the WAC 173-340 3-part test is not required.

MAXIMUM VALUE 3-PART TEST CALCULATION SHEET

Washington Closure Hanford
Originator J. D. Skoglie
Project 100-N Field Remediation
Subject 100-N-93 Waste Site Cleanup Verification 95% UCL Calculations

Date 06/10/14
Job No. 14655

Calc. No. 0100N-CA-V0273
Checked I. B. Berezovskiy

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1 **100-N-93 Waste Site Maximum Calculations**
2 **Verification Data - Excavation (EXC)**

3	Sample	Sample	Sample	Cadmium			Molybdenum			TPH - Diesel Range EXT			TPH - Diesel Range			Dimethyl phthalate		
4	Area	Number	Date	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
5	EXC-7	J1TPL4	5/15/14	0.077	B	0.042	0.27	U	0.27	1000	U	1000	700	U	700	23	U	23
6	Duplicate of J1TPL4	J1TPM0	5/15/14	0.067	B	0.040	0.30	B	0.25	930	U	930	630	U	630	21	U	21
7	EXC-1	J1TPK8	5/15/14	0.035	U	0.035	0.22	U	0.22	980	U	980	670	U	670	22	U	22
8	EXC-2	J1TPK9	5/15/14	0.040	U	0.040	0.26	U	0.26	980	U	980	670	U	670	23	U	23
9	EXC-3	J1TPL0	5/15/14	0.038	U	0.038	0.24	U	0.24	1000	U	1000	680	U	680	23	U	23
10	EXC-4	J1TPL1	5/15/14	0.041	U	0.041	0.26	U	0.26	4500		980	2000	J	670	35	J	23
11	EXC-5	J1TPL2	5/15/14	0.036	U	0.036	0.23	U	0.23	1000	U	1000	680	U	680	23	U	23
12	EXC-6	J1TPL3	5/15/14	0.10	B	0.040	0.25	U	0.25	1000	U	1000	680	U	680	23	U	23
13	EXC-8	J1TPL5	5/15/14	0.037	U	0.037	0.23	U	0.23	940	U	940	640	U	640	24	J	23
14	EXC-9	J1TPL6	5/15/14	0.038	U	0.038	0.31	B	0.24	2900	J	1000	1400	J	700	24	U	24
15	EXC-10	J1TPL7	5/15/14	0.041	U	0.041	0.26	U	0.26	1000	U	1000	680	U	680	23	U	23
16	EXC-11	J1TPL8	5/15/14	0.036	U	0.036	0.39	B	0.23	10000		940	4200		640	23	U	23
17	EXC-12	J1TPL9	5/15/14	0.037	U	0.037	0.24	U	0.24	7400		990	3000	J	670	23	U	23

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19 **Statistical Computations**

20		Cadmium			Molybdenum			TPH - Diesel Range EXT			TPH - Diesel Range			Dimethyl phthalate		
21	% < Detection limit	83%			75%			67%			67%			83%		
22	Maximum value	0.10			0.39			10000			4200			35		
23	**Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless noted otherwise**	0.81	GW & River Protection		8	GW Protection		200000 ug/kg	GW Protection		200000 ug/kg	GW Protection		1600000 ug/kg	GW Protection	
24	**3-PART TEST**															
25	Maximum > Cleanup Limit?	NA			NO			NO			NO			NO		
26	> 10% above Cleanup Limit?	NA			NO			NO			NO			NO		
27	Any sample > 2X Cleanup Limit?	NA			NO			NO			NO			NO		
28	**3-Part Test Compliance?**	Because all values are below background (0.81 mg/kg) the WAC 173-340 3-part test is not required.			The data set meets the 3-part test criteria when compared to the most stringent RAG.			The data set meets the 3-part test criteria when compared to the most stringent RAG.			The data set meets the 3-part test criteria when compared to the most stringent RAG.			The data set meets the 3-part test criteria when compared to the most stringent RAG.		

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CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie	Date 06/10/14	Calc. No. 0100N-CA-V0273	Rev. No. 0
Project 100-N Field Remediation	Job No. 14655	Checked J. B. Burezovskiy	Date 06/10/14
Subject 100-N-93 Waste Site Cleanup Verification 95% UCL Calculations			Sheet No. 9 of 12

Ecology Software (MTCAStat) Results, 100-N-93 Waste Site Excavation (EXC)

Arsenic 95% UCL Calculation

DATA	ID
3.2	J1TPL4/ J1TPM4
2.2	J1TPK8
1.2	J1TPK9
1.5	J1TPL0
3.7	J1TPL1
1.5	J1TPL2
3.9	J1TPL3
2.4	J1TPL5
3.1	J1TPL6
1.8	J1TPL7
2.0	J1TPL8
1.5	J1TPL9

Number of samples		Uncensored values	
Uncensored	12	Mean	2.3
Censored		Lognormal mean	2.3
Detection limit or PQL		Std. devn.	0.93
Method detection limit		Median	2.1
TOTAL	12	Min.	1.2
		Max.	3.9

Lognormal distribution? r-squared is: 0.953
Normal distribution? r-squared is: 0.923
Recommendations:
Use lognormal distribution.
UCL (Land's method) is 3.0

Barium 95% UCL Calculation

DATA	ID
63.6	J1TPL4/ J1TPM4
36.7	J1TPK8
40.6	J1TPK9
39.2	J1TPL0
50.1	J1TPL1
44.2	J1TPL2
72.4	J1TPL3
37.9	J1TPL5
61.5	J1TPL6
35.7	J1TPL7
52.6	J1TPL8
52.7	J1TPL9

Number of samples		Uncensored values	
Uncensored	12	Mean	48.9
Censored		Lognormal mean	49.0
Detection limit or PQL		Std. devn.	12.0
Method detection limit		Median	47.2
TOTAL	12	Min.	35.7
		Max.	72.4

Lognormal distribution? r-squared is: 0.945
Normal distribution? r-squared is: 0.923
Recommendations:
Use lognormal distribution.
UCL (Land's method) is 56.0

Beryllium 95% UCL Calculation

DATA	ID
0.22	J1TPL4/ J1TPM4
0.19	J1TPK8
0.21	J1TPK9
0.23	J1TPL0
0.25	J1TPL1
0.21	J1TPL2
0.26	J1TPL3
0.22	J1TPL5
0.34	J1TPL6
0.20	J1TPL7
0.23	J1TPL8
0.24	J1TPL9

Number of samples		Uncensored values	
Uncensored	12	Mean	0.23
Censored		Lognormal mean	0.23
Detection limit or PQL		Std. devn.	0.039
Method detection limit		Median	0.23
TOTAL	12	Min.	0.19
		Max.	0.34

Lognormal distribution? r-squared is: 0.867
Normal distribution? r-squared is: 0.796
Recommendations:
Reject BOTH lognormal and normal distributions
UCL (based on Z-statistic) is 0.25

Chromium 95% UCL Calculation

DATA	ID
13.6	J1TPL4/ J1TPM4
8.9	J1TPK8
2.9	J1TPK9
3.4	J1TPL0
11.7	J1TPL1
4.3	J1TPL2
14.9	J1TPL3
4.6	J1TPL5
7.9	J1TPL6
6.8	J1TPL7
6.8	J1TPL8
6.9	J1TPL9

Number of samples		Uncensored values	
Uncensored	12	Mean	7.7
Censored		Lognormal mean	7.6
Detection limit or PQL		Std. devn.	3.9
Method detection limit		Median	6.9
TOTAL	12	Min.	2.9
		Max.	14.9

Lognormal distribution? r-squared is: 0.972
Normal distribution? r-squared is: 0.935
Recommendations:
Use lognormal distribution.
UCL (Land's method) is 11.1

Cobalt 95% UCL Calculation

DATA	ID
5.7	J1TPL4/ J1TPM4
4.9	J1TPK8
7.9	J1TPK9
8.0	J1TPL0
7.5	J1TPL1
7.9	J1TPL2
5.7	J1TPL3
7.0	J1TPL5
8.4	J1TPL6
6.0	J1TPL7
6.5	J1TPL8
6.5	J1TPL9

Number of samples		Uncensored values	
Uncensored	12	Mean	6.8
Censored		Lognormal mean	6.8
Detection limit or PQL		Std. devn.	1.1
Method detection limit		Median	6.8
TOTAL	12	Min.	4.9
		Max.	8.4

Lognormal distribution? r-squared is: 0.945
Normal distribution? r-squared is: 0.953
Recommendations:
Use lognormal distribution.
UCL (Land's method) is 7.5

Copper 95% UCL Calculation

DATA	ID
18.2	J1TPL4/ J1TPM4
12.7	J1TPK8
16.5	J1TPK9
16.9	J1TPL0
17.8	J1TPL1
16.1	J1TPL2
16.4	J1TPL3
18.6	J1TPL5
21.5	J1TPL6
14.8	J1TPL7
16.6	J1TPL8
17.9	J1TPL9

Number of samples		Uncensored values	
Uncensored	12	Mean	17.0
Censored		Lognormal mean	17.0
Detection limit or PQL		Std. devn.	2.1
Method detection limit		Median	16.8
TOTAL	12	Min.	12.7
		Max.	21.5

Lognormal distribution? r-squared is: 0.918
Normal distribution? r-squared is: 0.926
Recommendations:
Use lognormal distribution.
UCL (Land's method) is 18.2

Lead 95% UCL Calculation

DATA	ID
3.0	J1TPL4/ J1TPM4
2.4	J1TPK8
2.0	J1TPK9
1.9	J1TPL0
4.0	J1TPL1
2.3	J1TPL2
4.2	J1TPL3
2.1	J1TPL5
4.7	J1TPL6
2.4	J1TPL7
2.7	J1TPL8
3.0	J1TPL9

Number of samples		Uncensored values	
Uncensored	12	Mean	2.9
Censored		Lognormal mean	2.9
Detection limit or PQL		Std. devn.	0.93
Method detection limit		Median	2.6
TOTAL	12	Min.	1.9
		Max.	4.7

Lognormal distribution? r-squared is: 0.935
Normal distribution? r-squared is: 0.887
Recommendations:
Use lognormal distribution.
UCL (Land's method) is 3.5

Manganese 95% UCL Calculation

DATA	ID
265	J1TPL4/ J1TPM4
223	J1TPK8
244	J1TPK9
268	J1TPL0
296	J1TPL1
259	J1TPL2
298	J1TPL3
217	J1TPL5
304	J1TPL6
246	J1TPL7
251	J1TPL8
248	J1TPL9

Number of samples		Uncensored values	
Uncensored	12	Mean	260
Censored		Lognormal mean	260
Detection limit or PQL		Std. devn.	28.1
Method detection limit		Median	255
TOTAL	12	Min.	217
		Max.	304

Lognormal distribution? r-squared is: 0.955
Normal distribution? r-squared is: 0.949
Recommendations:
Use lognormal distribution.
UCL (Land's method) is 275

Nickel 95% UCL Calculation

DATA	ID
12.9	J1TPL4/ J1TPM4
9.8	J1TPK8
6.7	J1TPK9
6.7	J1TPL0
14.6	J1TPL1
7.5	J1TPL2
13.6	J1TPL3
7.6	J1TPL5
10.7	J1TPL6
9.4	J1TPL7
10.9	J1TPL8
8.1	J1TPL9

Number of samples		Uncensored values	
Uncensored	12	Mean	9.9
Censored		Lognormal mean	9.9
Detection limit or PQL		Std. devn.	2.7
Method detection limit		Median	9.6
TOTAL	12	Min.	6.7
		Max.	14.6

Lognormal distribution? r-squared is: 0.957
Normal distribution? r-squared is: 0.941
Recommendations:
Use lognormal distribution.
UCL (Land's method) is 11.6

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-N Field Remediation
Subject 100-N-93 Waste Site Cleanup Verification 95% UCL Calculations

Date 06/10/14
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Ecology Software (MTCAStat) Results, 100-N-93 Waste Site Excavation (EXC)

Vanadium 95% UCL Calculation

DATA	ID
32.3	J1TPL4/ J1TPM4
35.9	J1TPK8
45.1	J1TPK9
47.1	J1TPL0
45.8	J1TPL1
36.7	J1TPL2
28.7	J1TPL3
36.5	J1TPL5
43.8	J1TPL6
41.1	J1TPL7
44.7	J1TPL8
46.4	J1TPL9

Number of samples		Uncensored values	
Uncensored	12	Mean	40.3
Censored		Lognormal mean	40.4
Detection limit or PQL		Std. devn.	6.1
Method detection limit		Median	42.5
TOTAL	12	Min.	28.7
		Max.	47.1

Lognormal distribution? Normal distribution?
r-squared is: 0.893 r-squared is: 0.910
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 43.5

Zinc 95% UCL Calculation

DATA	ID
32.2	J1TPL4/ J1TPM4
27.9	J1TPK8
35.8	J1TPK9
33.1	J1TPL0
38.0	J1TPL1
33.4	J1TPL2
35.1	J1TPL3
31.9	J1TPL5
40.5	J1TPL6
31.1	J1TPL7
34.6	J1TPL8
36.1	J1TPL9

Number of samples		Uncensored values	
Uncensored	12	Mean	34.1
Censored		Lognormal mean	34.2
Detection limit or PQL		Std. devn.	3.3
Method detection limit		Median	34.0
TOTAL	12	Min.	27.9
		Max.	40.5

Lognormal distribution? Normal distribution?
r-squared is: 0.976 r-squared is: 0.979
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 36.0

CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie
Project 100-N Field Remediation
Subject 100-N-93 Waste Site Cleanup Verification 95% UCL Calculations

Date 08/10/14
Job No. 14655

Calc. No. 0100N-CA-V0273
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1 **Duplicate/Split Analysis - 100-N-93 Waste Site Excavation (EXC)**

2 Sampling Area	Sample Number	Sample Date	Aluminum mg/kg	Q	PQL	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Beryllium mg/kg	Q	PQL	Cadmium mg/kg	Q	PQL	Calcium mg/kg	Q	PQL	Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL	Iron mg/kg	Q	PQL
4 EXC-7	J1TPL4	5/15/14	7000		1.6	3.3		0.67	66.7		0.078	0.23		0.034	0.077	B	0.042	8640		14.4	14.2		0.059	5.9	X	0.10	19.0		0.22	14100		3.9
5 Duplicate of J1TPL4	J1TPM0	5/15/14	6260		1.5	3.1		0.64	60.4		0.074	0.20		0.032	0.067	B	0.040	7060		13.8	12.9		0.057	5.4	X	0.098	17.3		0.21	12800		3.7
6 Split of J1TPL4	J1TPN4	5/15/14	5990		6.22	4.4		0.458	60.5		0.0915	0.419	B	0.0915	0.284	B	0.0915	7870		7.32	15.1	M	0.137	5.71		0.137	16.6		0.275	15400		7.32

7 **Analysis:**

8		TDL	5			10			2			0.2			0.2			100			1			2			1			5		
9	Duplicate Analysis	Both > PQL?	Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)		
10		Both >5xTDL?	Yes (calc RPD)			No-Stop (acceptable)			Yes (calc RPD)			No-Stop (acceptable)			No-Stop (acceptable)			Yes (calc RPD)			Yes (calc RPD)			No-Stop (acceptable)			Yes (calc RPD)			Yes (calc RPD)		
11		RPD	11.2%						9.9%									20.1%			9.6%						9.4%			9.7%		
12		Difference > 2 TDL?	Not applicable			No - acceptable			Not applicable			No - acceptable			No - acceptable			Not applicable			Not applicable			No - acceptable			Not applicable			Not applicable		
13	Split Analysis	Both > PQL?	Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)		
14		Both >5xTDL?	Yes (calc RPD)			No-Stop (acceptable)			Yes (calc RPD)			No-Stop (acceptable)			No-Stop (acceptable)			Yes (calc RPD)			Yes (calc RPD)			No-Stop (acceptable)			Yes (calc RPD)			Yes (calc RPD)		
15		RPD	15.6%						9.7%									11.9%			6.1%						13.5%			8.8%		
16		Difference > 2 TDL?	Not applicable			No - acceptable			Not applicable			No - acceptable			No - acceptable			Not applicable			Not applicable			No - acceptable			Not applicable			Not applicable		

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18 **Duplicate/Split Analysis - 100-N-93 Waste Site Excavation (EXC)**

19 Sampling Area	Sample Number	Sample Date	Lead mg/kg	Q	PQL	Magnesium mg/kg	Q	PQL	Manganese mg/kg	Q	PQL	Nickel mg/kg	Q	PQL	Potassium mg/kg	Q	PQL	Silicon mg/kg	Q	PQL	Sodium mg/kg	Q	PQL	Vanadium mg/kg	Q	PQL	Zinc mg/kg	Q	PQL
21 EXC-7	J1TPL4	5/15/14	3.1		0.28	5000		3.8	281		0.10	13.8		0.13	1140		41.8	389	J	5.8	173		60.2	34.0		0.096	33.4	X	0.41
22 Duplicate of J1TPL4	J1TPM0	5/15/14	2.9		0.26	4510		3.6	249		0.098	12.2		0.12	1010		40.0	297	J	5.5	150		57.6	30.6		0.092	31.0	X	0.39
23 Split of J1TPL4	J1TPN4	5/15/14	6.62		0.302	4330		7.78	262		0.183	12.2		0.137	927	N	5.86	527	*N	1.37	127		6.41	38.2		0.0915	32.9		0.386

24 **Analysis:**

25		TDL	5			75			5			4			400			2			50			2.5			1					
26	Duplicate Analysis	Both > PQL?	Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)					
27		Both >5xTDL?	No-Stop (acceptable)			Yes (calc RPD)			Yes (calc RPD)			No-Stop (acceptable)			No-Stop (acceptable)			Yes (calc RPD)			No-Stop (acceptable)			Yes (calc RPD)			Yes (calc RPD)					
28		RPD				10.3%			12.1%									21.6%						10.5%			7.5%					
29		Difference > 2 TDL?	No - acceptable			Not applicable			Not applicable			No - acceptable			No - acceptable			Not applicable			No - acceptable			Not applicable			Not applicable					
30	Split Analysis	Both > PQL?	Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)					
31		Both >5xTDL?	No-Stop (acceptable)			Yes (calc RPD)			Yes (calc RPD)			No-Stop (acceptable)			No-Stop (acceptable)			Yes (calc RPD)			No-Stop (acceptable)			Yes (calc RPD)			Yes (calc RPD)					
32		RPD				14.4%			7.0%									35.9%						11.6%			1.5%					
33		Difference > 2 TDL?	No - acceptable			Not applicable			Not applicable			No - acceptable			No - acceptable			Not applicable			No - acceptable			Not applicable			Not applicable					

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CALCULATION SHEET

Washington Closure Hanford

Originator J. D. Skoglie — Date 06/10/14 — Calc. No. 0100N-CA-V0273 — Rev. No. 0

Project 100-N Field Remediation — Job No. 14655 — Checked I. B. Berezovsky — Date 06/10/14

Subject 100-N-93 Waste Site Cleanup Verification 95% UCL Calculations — Sheet No. 12 of 12

Duplicate/Split Analysis - 100-N-93 Waste Site Focused Samples (FS)

Sampling Area	Sample Number	Sample Date	Aluminum mg/kg	Q	PQL	Arsenic mg/kg	Q	PQL	Barium mg/kg	Q	PQL	Beryllium mg/kg	Q	PQL	Cadmium mg/kg	Q	PQL	Calcium mg/kg	Q	PQL	Chromium mg/kg	Q	PQL	Cobalt mg/kg	Q	PQL	Copper mg/kg	Q	PQL	Iron mg/kg	Q	PQL
FS-2	J1TPN7	5/15/14	7430	X	1.6	4.0		0.87	62.6	X	0.077	0.27		0.034	0.11	B	0.042	7660	X	14.4	16.0	X	0.059	6.3	X	0.10	18.8		0.22	16000	X	3.9
Duplicate of J1TPN7	J1TPP4	5/15/14	7500	X	1.6	4.1		0.66	64.4	X	0.076	0.27		0.033	0.10	B	0.041	8110	X	14.2	16.4	X	0.058	6.4	X	0.10	19.8		0.22	15000	X	3.8
Split of J1TPN7	J1TPT3	5/15/14	6680		6.42	4.4		0.472	62.8		0.0944	0.465	B	0.0944	0.334	B	0.0944	7750		7.55	18.3		0.142	6.23		0.142	19.3		0.283	16900		7.55

Analysis:

	TDL		5			10			2			0.2			0.2			100			1			2			1			5		
Duplicate Analysis	Both > PQL?		Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)		
	Both >5xTDL?		Yes (calc RPD)			No-Stop (acceptable)			Yes (calc RPD)			No-Stop (acceptable)			No-Stop (acceptable)			Yes (calc RPD)			Yes (calc RPD)			No-Stop (acceptable)			Yes (calc RPD)			Yes (calc RPD)		
	RPD		0.9%			2.8%			5.7%			2.5%			6.2%			0.0%														
	Difference > 2 TDL?		Not applicable			No - acceptable			Not applicable			No - acceptable			No - acceptable			Not applicable			Not applicable			No - acceptable			Not applicable			Not applicable		
Split Analysis	Both > PQL?		Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)		
	Both >5xTDL?		Yes (calc RPD)			No-Stop (acceptable)			Yes (calc RPD)			No-Stop (acceptable)			No-Stop (acceptable)			Yes (calc RPD)			Yes (calc RPD)			No-Stop (acceptable)			Yes (calc RPD)			Yes (calc RPD)		
	RPD		10.6%			0.3%			1.2%			13.4%			2.6%			11.9%														
	Difference > 2 TDL?		Not applicable			No - acceptable			Not applicable			No - acceptable			No - acceptable			Not applicable			Not applicable			No - acceptable			Not applicable			Not applicable		

Duplicate/Split Analysis - 100-N-93 Waste Site Focused Samples (FS)

Sampling Area	Sample Number	Sample Date	Lead mg/kg	Q	PQL	Magnesium mg/kg	Q	PQL	Manganese mg/kg	Q	PQL	Nickel mg/kg	Q	PQL	Potassium mg/kg	Q	PQL	Silicon mg/kg	Q	PQL	Sodium mg/kg	Q	PQL	Vanadium mg/kg	Q	PQL	Zinc mg/kg	Q	PQL
FS-2	J1TPN7	5/15/14	4.0		0.26	5060	X	3.8	299	X	0.10	15.0	X	0.13	1160		41.8	362		5.8	201		60.2	35.2	X	0.086	35.5	X	0.41
Duplicate of J1TPN7	J1TPP4	5/15/14	3.6		0.27	5130	X	3.7	308	X	0.10	15.5	X	0.12	1220		41.2	319		5.7	206		59.3	35.1	X	0.095	35.2	X	0.40
Split of J1TPN7	J1TPT3	5/15/14	7.54		0.311	4620		8.02	294		0.189	14.6		0.142	1050		6.04	1450		1.42	186		6.61	41.1		0.0944	37.0		0.377

Analysis:

	TDL		5			75			5			4			400			2			50			2.5			1					
Duplicate Analysis	Both > PQL?		Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)					
	Both >5xTDL?		No-Stop (acceptable)			Yes (calc RPD)			Yes (calc RPD)			No-Stop (acceptable)			No-Stop (acceptable)			Yes (calc RPD)			No-Stop (acceptable)			Yes (calc RPD)			Yes (calc RPD)					
	RPD					1.0%			3.0%									12.6%						0.3%			0.8%					
	Difference > 2 TDL?		No - acceptable			Not applicable			Not applicable			No - acceptable			No - acceptable			Not applicable			No - acceptable			Not applicable			Not applicable					
Split Analysis	Both > PQL?		Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)			Yes (continue)					
	Both >5xTDL?		No-Stop (acceptable)			Yes (calc RPD)			Yes (calc RPD)			No-Stop (acceptable)			No-Stop (acceptable)			Yes (calc RPD)			No-Stop (acceptable)			Yes (calc RPD)			Yes (calc RPD)					
	RPD					9.5%			1.7%									120.1%						15.5%			4.1%					
	Difference > 2 TDL?		No - acceptable			Not applicable			Not applicable			No - acceptable			No - acceptable			Not applicable			No - acceptable			Not applicable			Not applicable					

Attachment 1. 100-N-93 Waste Site Verification Sample Results (Metals, TPH, and Physical).

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
EXC-7	J1TPL4	5/15/14	7000		1.6	0.39	UJ	0.39	3.3		0.67	66.7		0.078	0.23		0.034
Duplicate of J1TPL4	J1TPM0	5/15/14	6260		1.5	0.37	UJ	0.37	3.1		0.64	60.4		0.074	0.20		0.032
EXC-1	J1TPK8	5/15/14	5040		1.3	0.33	UJ	0.33	2.2		0.57	36.7		0.065	0.19		0.028
EXC-2	J1TPK9	5/15/14	4050		1.5	0.37	UJ	0.37	1.2		0.65	40.6		0.075	0.21		0.032
EXC-3	J1TPL0	5/15/14	4070		1.4	0.35	UJ	0.35	1.5		0.62	39.2		0.071	0.23		0.031
EXC-4	J1TPL1	5/15/14	5820		1.6	0.38	UJ	0.38	3.7		0.66	50.1		0.076	0.25		0.033
EXC-5	J1TPL2	5/15/14	4000		1.3	0.33	UJ	0.33	1.5		0.57	44.2		0.066	0.21		0.029
EXC-6	J1TPL3	5/15/14	6900		1.5	0.37	UJ	0.37	3.9		0.64	72.4		0.074	0.26		0.032
EXC-8	J1TPL5	5/15/14	4520		1.4	0.34	UJ	0.34	2.4		0.59	37.9		0.068	0.22		0.030
EXC-9	J1TPL6	5/15/14	7420		1.4	0.35	UJ	0.35	3.1		0.61	61.5		0.070	0.34		0.030
EXC-10	J1TPL7	5/15/14	4580		1.6	0.38	UJ	0.38	1.8		0.67	35.7		0.077	0.20		0.033
EXC-11	J1TPL8	5/15/14	5130		1.4	0.33	UJ	0.33	2.0		0.58	52.6		0.067	0.23		0.029
EXC-12	J1TPL9	5/15/14	5620		1.4	0.34	UJ	0.34	1.5		0.60	52.7		0.069	0.24		0.030
Split of J1TPL4	J1TPN4	5/15/14	5990		6.22	0.313	B	0.302	4.40		0.458	60.5		0.0915	0.419	B	0.0915
FS-2	J1TPN7	5/15/14	7430	X	1.6	0.39	U	0.39	4.0		0.67	62.6	X	0.077	0.27		0.034
Duplicate of J1TPN7	J1TPP4	5/15/14	7500	X	1.6	0.38	U	0.38	4.1		0.66	64.4	X	0.076	0.27		0.033
FS-1	J1TPN6	5/15/14	5690	X	1.4	0.34	U	0.34	2.2		0.58	48.8	X	0.067	0.30		0.029
FS-3	J1TPN8	5/15/14	6220	X	1.4	0.34	U	0.34	1.8		0.59	51.5	X	0.068	0.33		0.030
FS-4	J1TPN9	5/15/14	6070	X	1.6	0.39	U	0.39	2.1		0.68	44.5	X	0.078	0.26		0.034
FS-5	J1TPP0	5/15/14	4210	X	1.5	0.37	U	0.37	1.8		0.64	54.6	X	0.074	0.27		0.032
FS-6	J1TPP1	5/15/14	6090	X	1.4	0.34	U	0.34	3.2		0.59	52.2	X	0.068	0.22		0.030
FS-7	J1TPP2	5/15/14	5160	X	1.5	0.36	U	0.36	1.8		0.62	48.5	X	0.072	0.27		0.031
FS-8	J1TPP3	5/15/14	3960	X	1.4	0.35	U	0.35	1.4		0.60	43.8	X	0.069	0.27		0.030
Split of J1TPN7	J1TPT3	5/15/14	6680		6.42	0.311	U	0.311	4.4		0.472	62.8		0.0944	0.465	B	0.0944
Equipment Blank	J1TPP5	5/15/14	106	X	1.5	0.37	U	0.37	0.64	U	0.64	1.1	X	0.073	0.032	U	0.032

Sample Location	HEIS Number	Sample Date	Boron			Cadmium			Calcium			Chromium			Cobalt		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
EXC-7	J1TPL4	5/15/14	1.0	U	1.0	0.077	B	0.042	8640		14.4	14.2		0.059	5.9	X	0.10
Duplicate of J1TPL4	J1TPM0	5/15/14	0.96	U	0.96	0.067	B	0.040	7060		13.8	12.9		0.057	5.4	X	0.098
EXC-1	J1TPK8	5/15/14	0.84	U	0.84	0.035	U	0.035	5120		12.1	8.9		0.050	4.9	X	0.086
EXC-2	J1TPK9	5/15/14	0.96	U	0.96	0.040	U	0.040	4790		13.8	2.9		0.057	7.9	X	0.098
EXC-3	J1TPL0	5/15/14	0.91	U	0.91	0.038	U	0.038	4930		13.2	3.4		0.054	8.0	X	0.093
EXC-4	J1TPL1	5/15/14	0.99	U	0.99	0.041	U	0.041	5970		14.2	11.7		0.058	7.6	X	0.10
EXC-5	J1TPL2	5/15/14	0.85	U	0.85	0.036	U	0.036	4550		12.2	4.3		0.050	7.9	X	0.087
EXC-6	J1TPL3	5/15/14	0.96	U	0.96	0.10	B	0.040	12300		13.8	14.9		0.057	5.7	X	0.098
EXC-8	J1TPL5	5/15/14	0.88	U	0.88	0.037	U	0.037	4820		12.7	4.6		0.052	7.0	X	0.090
EXC-9	J1TPL6	5/15/14	0.90	U	0.90	0.038	U	0.038	6300		13.0	7.9		0.053	8.4	X	0.092
EXC-10	J1TPL7	5/15/14	0.99	U	0.99	0.041	U	0.041	5360		14.3	6.8		0.059	6.0	X	0.10
EXC-11	J1TPL8	5/15/14	0.86	U	0.86	0.036	U	0.036	6380		12.4	6.8		0.051	6.5	X	0.088
EXC-12	J1TPL9	5/15/14	0.89	U	0.89	0.037	U	0.037	6340		12.8	6.9		0.053	6.5	X	0.091
Split of J1TPL4	J1TPN4	5/15/14	0.915	U	0.915	0.284	B	0.0915	7670		7.32	15.1	M	0.137	5.71		0.137
FS-2	J1TPN7	5/15/14	1.0	U	1.0	0.11	B	0.042	7660	X	14.4	16.0	X	0.059	6.3	X	0.10
Duplicate of J1TPN7	J1TPP4	5/15/14	0.99	U	0.99	0.10	B	0.041	8110	X	14.2	16.4	X	0.058	6.4	X	0.10
FS-1	J1TPN6	5/15/14	0.87	U	0.87	0.036	U	0.036	6330	X	12.5	6.7	X	0.051	8.5	X	0.089
FS-3	J1TPN8	5/15/14	0.88	U	0.88	0.037	U	0.037	5400	X	12.7	7.2	X	0.052	8.7	X	0.090
FS-4	J1TPN9	5/15/14	1.0	U	1.0	0.042	U	0.042	8360	X	14.5	9.8	X	0.060	6.1	X	0.10
FS-5	J1TPP0	5/15/14	0.96	U	0.96	0.040	U	0.040	4810	X	13.8	2.9	X	0.057	7.8	X	0.098
FS-6	J1TPP1	5/15/14	0.88	U	0.88	0.059	B	0.037	7330	X	12.7	13.5	X	0.052	5.4	X	0.090
FS-7	J1TPP2	5/15/14	0.93	U	0.93	0.039	U	0.039	4330	X	13.3	7.5	X	0.055	6.6	X	0.094
FS-8	J1TPP3	5/15/14	0.89	U	0.89	0.037	U	0.037	4600	X	12.8	3.2	X	0.053	8.3	X	0.091
Split of J1TPN7	J1TPT3	5/15/14	0.944	U	0.944	0.334	B	0.0944	7750		7.55	18.3		0.142	6.23		0.142
Equipment Blank	J1TPP5	5/15/14	0.94	U	0.94	0.039	U	0.039	34.1	BX	13.6	0.13	BX	0.056	0.096	UX	0.096

*Duplicate analysis not within control limits
B = blank contamination (inorganic constituents)
C = </= 5x blank concentration
D = reported from a dilution.
EXC = excavation
FS = focused sample
HEIS = Hanford Environmental Information System
J = estimate
M = duplicate precision not met.
N = recovery outside control limits
ND = non detect (asbestos sampling)

Attachment	1	Sheet No.	1 of 12
Originator	J. D. Skoglie	Date	6/10/14
Checked	I. B. Berezovskiy	Date	6/10/14
Calc. No.	0100N-CA-V0273	Rev. No.	0

P = target analyte with >40% difference between column analyses.
PQL = practical quantitation limit
Q = qualifier
U = undetected
X = >40% difference between primary and confirmation detector results.

Attachment 1. 100-N-93 Waste Site Verification Sample Results (Metals, TPH, and Physical).

Sample Location	HEIS Number	Sample Date	Copper			Iron			Lead			Magnesium			Manganese		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
EXC-7	J1TPL4	5/15/14	19.0		0.22	14100		3.9	3.1		0.28	5000		3.8	281		0.10
Duplicate of J1TPL4	J1TPM0	5/15/14	17.3		0.21	12800		3.7	2.9		0.26	4510		3.6	249		0.098
EXC-1	J1TPK8	5/15/14	12.7		0.19	13700		3.3	2.4		0.23	3910		3.2	223		0.086
EXC-2	J1TPK9	5/15/14	16.5		0.21	20400		3.7	2.0		0.26	3850		3.6	244		0.098
EXC-3	J1TPL0	5/15/14	16.9		0.20	20800		3.5	1.9		0.25	3960		3.5	268		0.093
EXC-4	J1TPL1	5/15/14	17.8		0.22	19200		3.8	4.0		0.27	5140		3.7	296		0.10
EXC-5	J1TPL2	5/15/14	16.1		0.19	19000		3.3	2.3		0.23	3800		3.2	259		0.087
EXC-6	J1TPL3	5/15/14	16.4		0.21	13900		3.7	4.2		0.26	5820		3.6	298		0.098
EXC-8	J1TPL5	5/15/14	18.6		0.19	18500		3.4	2.1		0.24	3960		3.3	217		0.090
EXC-9	J1TPL6	5/15/14	21.5		0.20	19900		3.5	4.7		0.25	4920		3.4	304		0.092
EXC-10	J1TPL7	5/15/14	14.8		0.22	16200		3.8	2.4		0.27	4090		3.7	246		0.10
EXC-11	J1TPL8	5/15/14	16.6		0.19	17700		3.3	2.7		0.24	3990		3.3	251		0.088
EXC-12	J1TPL9	5/15/14	17.9		0.20	18800		3.4	3.0		0.24	4010		3.3	248		0.091
Split of J1TPL4	J1TPN4	5/15/14	16.6		0.275	15400		7.32	6.62		0.302	4330		7.78	262		0.183
FS-2	J1TPN7	5/15/14	18.8		0.22	15000	X	3.9	4.0		0.28	5080	X	3.8	299	X	0.10
Duplicate of J1TPN7	J1TPP4	5/15/14	19.8		0.22	15000	X	3.8	3.8		0.27	5130	X	3.7	308	X	0.10
FS-1	J1TPN6	5/15/14	19.3		0.19	22200	X	3.4	3.2		0.24	4830	X	3.3	296	X	0.089
FS-3	J1TPN8	5/15/14	20.1		0.20	23200	X	3.4	2.9		0.24	5020	X	3.3	315	X	0.090
FS-4	J1TPN9	5/15/14	16.8		0.22	15900	X	3.9	3.1		0.28	4640	X	3.8	273	X	0.10
FS-5	J1TPP0	5/15/14	17.8		0.21	19900	X	3.7	2.5		0.26	3500	X	3.6	250	X	0.098
FS-6	J1TPP1	5/15/14	14.5		0.20	12900	X	3.4	3.3		0.24	4510	X	3.3	246	X	0.090
FS-7	J1TPP2	5/15/14	16.0		0.20	17200	X	3.6	2.8		0.26	3840	X	3.5	238	X	0.094
FS-8	J1TPP3	5/15/14	17.1		0.20	21000	X	3.5	2.4		0.25	4020	X	3.4	278	X	0.091
Split of J1TPN7	J1TPT3	5/15/14	19.3		0.283	16900		7.55	7.54		0.311	4620		8.02	294		0.189
Equipment Blank	J1TPP5	5/15/14	0.28	B	0.21	144	X	3.7	0.26	U	0.26	12.8	BX	3.6	3.8	X	0.096

Sample Location	HEIS Number	Sample Date	Mercury			Molybdenum			Nickel			Potassium			Selenium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
EXC-7	J1TPL4	5/15/14	0.0062	U	0.0062	0.27	U	0.27	13.6		0.13	1140		41.8	0.88	U	0.88
Duplicate of J1TPL4	J1TPM0	5/15/14	0.0065	U	0.0065	0.30	B	0.25	12.2		0.12	1010		40.0	0.84	U	0.84
EXC-1	J1TPK8	5/15/14	0.0056	U	0.0056	0.22	U	0.22	9.8		0.11	726		35.1	0.74	U	0.74
EXC-2	J1TPK9	5/15/14	0.0056	U	0.0056	0.26	U	0.26	6.7		0.12	513		40.2	0.84	U	0.84
EXC-3	J1TPL0	5/15/14	0.0060	U	0.0060	0.24	U	0.24	6.7		0.11	554		38.2	0.80	U	0.80
EXC-4	J1TPL1	5/15/14	0.0056	U	0.0056	0.26	U	0.26	14.6		0.12	926		41.2	0.86	U	0.86
EXC-5	J1TPL2	5/15/14	0.0051	U	0.0051	0.23	U	0.23	7.5		0.11	650		35.5	0.74	U	0.74
EXC-6	J1TPL3	5/15/14	0.0062	U	0.0062	0.25	U	0.25	13.6		0.12	1350		40.0	0.84	U	0.84
EXC-8	J1TPL5	5/15/14	0.0061	U	0.0061	0.23	U	0.23	7.6		0.11	577		36.8	0.77	U	0.77
EXC-9	J1TPL6	5/15/14	0.0063	U	0.0063	0.31	B	0.24	10.7		0.11	1220		37.8	0.79	U	0.79
EXC-10	J1TPL7	5/15/14	0.0055	U	0.0055	0.26	U	0.26	9.4		0.12	614		41.5	0.87	U	0.87
EXC-11	J1TPL8	5/15/14	0.0054	U	0.0054	0.39	B	0.23	10.9		0.11	800		36.1	0.76	U	0.76
EXC-12	J1TPL9	5/15/14	0.0053	U	0.0053	0.24	U	0.24	8.1		0.11	804		37.1	0.78	U	0.78
Split of J1TPL4	J1TPN4	5/15/14	0.00461	B	0.00407	0.249	B	0.183	12.2		0.137	927	N	5.86	0.305	DU	0.305
FS-2	J1TPN7	5/15/14	0.0069	U	0.0069	0.32	B	0.27	15.0	X	0.13	1180		41.8	0.88	U	0.88
Duplicate of J1TPN7	J1TPP4	5/15/14	0.0066	U	0.0066	0.26	U	0.26	15.5	X	0.12	1220		41.2	0.86	U	0.86
FS-1	J1TPN6	5/15/14	0.0061	U	0.0061	0.33	B	0.23	9.3	X	0.11	886		36.3	0.76	U	0.76
FS-3	J1TPN8	5/15/14	0.0057	U	0.0057	0.23	U	0.23	9.6	X	0.11	933		36.9	0.77	U	0.77
FS-4	J1TPN9	5/15/14	0.0066	U	0.0066	0.27	U	0.27	10.4	X	0.13	929		42.3	0.89	U	0.89
FS-5	J1TPP0	5/15/14	0.0057	U	0.0057	0.25	U	0.25	6.4	X	0.12	596		40.0	0.84	U	0.84
FS-6	J1TPP1	5/15/14	0.0061	U	0.0061	0.23	U	0.23	14.2	X	0.11	1010		36.9	0.77	U	0.77
FS-7	J1TPP2	5/15/14	0.0058	U	0.0058	0.88	B	0.25	8.9	X	0.12	739		38.7	0.81	U	0.81
FS-8	J1TPP3	5/15/14	0.0061	U	0.0061	0.24	U	0.24	6.9	X	0.11	597		37.3	0.78	U	0.78
Split of J1TPN7	J1TPT3	5/15/14	0.00495	B	0.0042	0.323	B	0.189	14.6		0.142	1050		6.04	0.335	DU	0.335
Equipment Blank	J1TPP5	5/15/14	0.0057	U	0.0057	0.25	U	0.25	0.12	UX	0.12	39.4	U	39.4	0.83	U	0.83

Attachment	1	Sheet No.	2 of 12
Originator	J. D. Skoglie	Date	6/10/14
Checked	I. B. Berezovskiy	Date	6/10/14
Calc. No.	0100N-CA-V0273	Rev. No.	0

Attachment 1. 100-N-93 Waste Site Verification Sample Results (Metals, TPH, and Physical).

Sample Location	HEIS Number	Sample Date	Silicon			Silver			Sodium			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
EXC-7	J1TPL4	5/15/14	369	J	5.8	0.16	U	0.16	173		60.2	34.0		0.096	33.4	X	0.41
Duplicate of J1TPL4	J1TPM0	5/15/14	297	J	5.5	0.16	U	0.16	150		57.6	30.6		0.092	31.0	X	0.39
EXC-1	J1TPK8	5/15/14	197	J	4.9	0.14	U	0.14	164		50.6	35.9		0.081	27.9	X	0.34
EXC-2	J1TPK9	5/15/14	123	J	5.6	0.16	U	0.16	332		57.9	45.1		0.092	35.8	X	0.39
EXC-3	J1TPL0	5/15/14	133	J	5.3	0.15	U	0.15	317		55.0	47.1		0.088	33.1	X	0.37
EXC-4	J1TPL1	5/15/14	226	J	5.7	0.16	U	0.16	258		59.3	45.8		0.094	38.0	X	0.40
EXC-5	J1TPL2	5/15/14	172	J	4.9	0.14	U	0.14	239		51.1	36.7		0.081	33.4	X	0.34
EXC-6	J1TPL3	5/15/14	266	J	5.5	0.16	U	0.16	174		57.6	28.7		0.092	35.1	X	0.39
EXC-8	J1TPL5	5/15/14	135	J	5.1	0.14	U	0.14	344		52.9	36.5		0.084	31.9	X	0.36
EXC-9	J1TPL6	5/15/14	129	J	5.2	0.15	U	0.15	460		54.3	43.8		0.087	40.5	X	0.37
EXC-10	J1TPL7	5/15/14	121	J	5.7	0.16	U	0.16	217		59.7	41.1		0.095	31.1	X	0.40
EXC-11	J1TPL8	5/15/14	259	J	5.0	0.14	U	0.14	312		52.0	44.7		0.083	34.6	X	0.35
EXC-12	J1TPL9	5/15/14	187	J	5.1	0.14	U	0.14	319		53.4	46.4		0.085	36.1	X	0.36
Split of J1TPL4	J1TPN4	5/15/14	527	*N	1.37	0.0915	U	0.0915	127		6.41	38.2		0.0915	32.9		0.366
FS-2	J1TPN7	5/15/14	362		5.8	0.16	U	0.16	201		60.2	35.2	X	0.096	35.5	X	0.41
Duplicate of J1TPN7	J1TPP4	5/15/14	319		5.7	0.16	U	0.16	206		59.3	35.1	X	0.095	35.2	X	0.40
FS-1	J1TPN6	5/15/14	91.4	M	5.0	0.14	U	0.14	569		52.3	46.5	X	0.083	38.6	X	0.35
FS-3	J1TPN8	5/15/14	106		5.1	0.14	U	0.14	354		53.1	55.0	X	0.085	39.6	X	0.36
FS-4	J1TPN9	5/15/14	280		5.8	0.16	U	0.16	255		60.8	40.0	X	0.097	32.8	X	0.41
FS-5	J1TPP0	5/15/14	75.7		5.5	0.16	U	0.16	324		57.5	44.5	X	0.092	35.4	X	0.39
FS-6	J1TPP1	5/15/14	284		5.1	0.14	U	0.14	179		53.1	30.4	X	0.085	28.8	X	0.36
FS-7	J1TPP2	5/15/14	309		5.3	0.15	U	0.15	250		55.7	40.3	X	0.089	33.2	X	0.38
FS-8	J1TPP3	5/15/14	139		5.1	0.15	U	0.15	270		53.7	47.1	X	0.085	35.9	X	0.36
Split of J1TPN7	J1TPT3	5/15/14	1450		1.42	0.0944	U	0.0944	166		6.61	41.1		0.0944	37.0		0.377
Equipment Blank	J1TPP5	5/15/14	95.3		5.4	0.15	U	0.15	56.8	U	56.8	0.23	BX	0.090	0.54	BX	0.38

Sample Location	HEIS Number	Sample Date	TPH - Diesel Range EXT			TPH - Diesel Range			TPH - motor oil (high boiling)			Percent moisture (wet sample)		
			ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	%	Q	PQL
EXC-7	J1TPL4	5/15/14	1000	U	1000	700	U	700				2.9		0.10
Duplicate of J1TPL4	J1TPM0	5/15/14	930	U	930	630	U	630				2.4		0.10
EXC-1	J1TPK8	5/15/14	980	U	980	670	U	670				0.27	M	0.10
EXC-2	J1TPK9	5/15/14	980	U	980	670	U	670				2.0		0.10
EXC-3	J1TPL0	5/15/14	1000	U	1000	680	U	680				1.7		0.10
EXC-4	J1TPL1	5/15/14	4500		980	2000	J	670				1.5		0.10
EXC-5	J1TPL2	5/15/14	1000	U	1000	680	U	680				2.1		0.10
EXC-6	J1TPL3	5/15/14	1000	U	1000	680	U	680				1.5		0.10
EXC-8	J1TPL5	5/15/14	940	U	940	640	U	640				2.3		0.10
EXC-9	J1TPL6	5/15/14	2900	J	1000	1400	J	700				3.9		0.10
EXC-10	J1TPL7	5/15/14	1000	U	1000	680	U	680				1.1		0.10
EXC-11	J1TPL8	5/15/14	10000		940	4200		640				1.3		0.10
EXC-12	J1TPL9	5/15/14	7400		990	3000	J	670				1.4		0.10
Split of J1TPL4	J1TPN4	5/15/14				2210	U	2210	2610	J	2210			
FS-2	J1TPN7	5/15/14	1100	U	1100	730	U	730				7.5		0.10
Duplicate of J1TPN7	J1TPP4	5/15/14	1000	U	1000	700	U	700				7.1		0.10
FS-1	J1TPN6	5/15/14	1000	U	1000	690	U	690				3.5		0.10
FS-3	J1TPN8	5/15/14	1000	U	1000	690	U	690				2.5		0.10
FS-4	J1TPN9	5/15/14	2000	J	970	1200	J	660				4.9		0.10
FS-5	J1TPP0	5/15/14	1000	U	1000	690	U	690				3.3		0.10
FS-6	J1TPP1	5/15/14	990	U	990	670	U	670				1.7		0.10
FS-7	J1TPP2	5/15/14	14000		970	6400		660				1.1		0.10
FS-8	J1TPP3	5/15/14	1000	U	1000	700	U	700				2.7		0.10
Split of J1TPN7	J1TPT3	5/15/14				2300	U	2300	2300	U	2300			
Equipment Blank	J1TPP5	5/15/14										0.10	U	0.10

Attachment	1	Sheet No.	3 of 12
Originator	J. D. Skoglie	Date	6/10/14
Checked	I. B. Berezovskiy	Date	6/10/14
Calc. No.	0100N-CA-V0273	Rev. No.	0

Attachment 1. 100-N-93 Waste Site Verification Sample Results (Organics).

CONSTITUENT	CLASS	EXC-7 - J1TPL4			Duplicate of J1TPL4 - J1TPM0			EXC-1 - J1TPK8			EXC-2 - J1TPK9			EXC-3 - J1TPL0		
		5/15/14			5/15/14			5/15/14			5/15/14			5/15/14		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	10	U	10	10	U	10	9.9	U	9.9	9.7	U	9.7	9.8	U	9.8
Acenaphthylene	PAH	9.2	U	9.2	9.1	U	9.1	8.9	U	8.9	8.7	U	8.7	8.9	U	8.9
Anthracene	PAH	3.1	U	3.1	3.1	U	3.1	3.0	U	3.0	2.9	U	2.9	3.0	U	3.0
Benzo(a)anthracene	PAH	3.2	U	3.2	3.2	U	3.2	3.2	U	3.2	3.1	U	3.1	3.1	U	3.1
Benzo(a)pyrene	PAH	6.5	U	6.5	6.5	U	6.5	6.3	U	6.3	6.2	U	6.2	6.3	U	6.3
Benzo(b)fluoranthene	PAH	4.3	U	4.3	4.2	U	4.2	4.2	U	4.2	4.1	U	4.1	4.1	U	4.1
Benzo(ghi)perylene	PAH	7.3	U	7.3	7.3	U	7.3	7.1	U	7.1	7.0	U	7.0	7.1	U	7.1
Benzo(k)fluoranthene	PAH	4.0	U	4.0	4.0	U	4.0	3.9	U	3.9	3.8	U	3.8	3.9	U	3.9
Chrysene	PAH	4.9	U	4.9	4.9	U	4.9	4.8	U	4.8	4.7	U	4.7	4.8	U	4.8
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
Fluorene	PAH	5.4	U	5.4	5.3	U	5.3	5.2	U	5.2	5.1	U	5.1	5.2	U	5.2
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
Naphthalene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
Phenanthrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
Pyrene	PAH	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
Aroclor-1016	PCB	2.8	U	2.8	2.8	U	2.8	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6
Aroclor-1221	PCB	8.1	U	8.1	8.1	U	8.1	7.9	U	7.9	7.9	U	7.9	7.6	U	7.6
Aroclor-1232	PCB	2.0	U	2.0	2.0	U	2.0	2.0	U	2.0	2.0	U	2.0	1.9	U	1.9
Aroclor-1242	PCB	4.7	U	4.7	4.7	U	4.7	4.6	U	4.6	4.6	U	4.6	4.4	U	4.4
Aroclor-1248	PCB	4.7	U	4.7	4.7	U	4.7	4.6	U	4.6	4.6	U	4.6	4.4	U	4.4
Aroclor-1254	PCB	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.5	U	2.5
Aroclor-1260	PCB	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6	2.5	U	2.5

CONSTITUENT	CLASS	EXC-4 - J1TPL1			EXC-5 - J1TPL2			EXC-6 - J1TPL3			EXC-8 - J1TPL5			EXC-9 - J1TPL6		
		5/15/14			5/15/14			5/15/14			5/15/14			5/15/14		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.4	U	9.4	9.7	U	9.7	9.9	U	9.9	10	U	10	10	U	10
Acenaphthylene	PAH	8.5	U	8.5	8.7	U	8.7	8.9	U	8.9	9.0	U	9.0	9.2	U	9.2
Anthracene	PAH	2.9	U	2.9	3.0	U	3.0	3.0	U	3.0	3.0	U	3.0	3.1	U	3.1
Benzo(a)anthracene	PAH	3.0	U	3.0	3.1	U	3.1	3.2	U	3.2	3.2	U	3.2	3.3	U	3.3
Benzo(a)pyrene	PAH	6.0	U	6.0	6.2	U	6.2	6.3	U	6.3	6.4	U	6.4	6.5	U	6.5
Benzo(b)fluoranthene	PAH	3.9	U	3.9	4.1	U	4.1	4.2	U	4.2	4.2	U	4.2	4.3	U	4.3
Benzo(ghi)perylene	PAH	6.8	U	6.8	7.0	U	7.0	7.1	U	7.1	7.2	U	7.2	7.3	U	7.3
Benzo(k)fluoranthene	PAH	3.7	U	3.7	3.8	U	3.8	3.9	U	3.9	3.9	U	3.9	4.0	U	4.0
Chrysene	PAH	4.5	U	4.5	4.7	U	4.7	4.8	U	4.8	4.8	U	4.8	4.9	U	4.9
Dibenz[a,h]anthracene	PAH	10	U	10	11	U	11	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	12	U	12	13	U	13	13	U	13	13	U	13	13	U	13
Fluorene	PAH	5.0	U	5.0	5.1	U	5.1	5.2	U	5.2	5.3	U	5.3	5.4	U	5.4
Indeno(1,2,3-cd)pyrene	PAH	11	U	11	12	U	12	12	U	12	12	U	12	12	U	12
Naphthalene	PAH	11	U	11	12	U	12	12	U	12	12	U	12	12	U	12
Phenanthrene	PAH	11	U	11	12	U	12	12	U	12	12	U	12	12	U	12
Pyrene	PAH	11	U	11	12	U	12	12	U	12	12	U	12	12	U	12
Aroclor-1016	PCB	2.6	U	2.6	2.7	U	2.7	2.8	U	2.8	2.7	U	2.7	2.8	U	2.8
Aroclor-1221	PCB	7.7	U	7.7	7.7	U	7.7	8.1	U	8.1	7.9	U	7.9	8.0	U	8.0
Aroclor-1232	PCB	1.9	U	1.9	1.9	U	1.9	2.0	U	2.0	2.0	U	2.0	2.0	U	2.0
Aroclor-1242	PCB	4.4	U	4.4	4.5	U	4.5	4.7	U	4.7	4.6	U	4.6	4.6	U	4.6
Aroclor-1248	PCB	4.4	U	4.4	4.5	U	4.5	4.7	U	4.7	4.6	U	4.6	4.6	U	4.6
Aroclor-1254	PCB	2.5	U	2.5	2.5	U	2.5	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6
Aroclor-1260	PCB	2.5	U	2.5	2.5	U	2.5	2.6	U	2.6	2.6	U	2.6	2.6	U	2.6

Attachment	1	Sheet No.	4 of 12
Originator	J. D. Skoglie	Date	6/10/14
Checked	I. B. Berezovskiy	Date	6/10/14
Calc. No.	0100N-CA-V0273	Rev. No.	0

Attachment 1. 100-N-93 Waste Site Verification Sample Results (Organics).

CONSTITUENT	CLASS	EXC-10 - J1TPL7			EXC-11 - J1TPL8			EXC-12 - J1TPL9			Split of J1TPL4 - J1TPN4			FS-2 - J1TPN7		
		5/15/14			5/15/14			5/15/14			5/15/14			5/15/14		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	9.9	U	9.9	10	UN	10	10	U	10	5.11	U	5.11	10	U	10
Acenaphthylene	PAH	8.9	U	8.9	9.0	UN	9.0	9.1	U	9.1	5.11	U	5.11	9.1	U	9.1
Anthracene	PAH	3.0	U	3.0	3.0	U	3.0	3.1	U	3.1	1.70	U	1.70	3.1	U	3.1
Benzo(a)anthracene	PAH	3.2	U	3.2	3.2	U	3.2	3.2	U	3.2	0.545	U	0.545	3.2	U	3.2
Benzo(a)pyrene	PAH	6.3	U	6.3	6.4	U	6.4	6.5	U	6.5	0.545	U	0.545	6.5	U	6.5
Benzo(b)fluoranthene	PAH	4.2	U	4.2	4.2	UN	4.2	4.2	U	4.2	0.545	U	0.545	4.3	U	4.3
Benzo(ghi)perylene	PAH	7.1	U	7.1	7.2	U	7.2	7.3	U	7.3	0.545	U	0.545	7.3	U	7.3
Benzo(k)fluoranthene	PAH	3.9	U	3.9	3.9	U	3.9	4.0	U	4.0	0.272	U	0.272	4.0	U	4.0
Chrysene	PAH	4.8	U	4.8	4.8	U	4.8	4.9	U	4.9	0.545	U	0.545	4.9	U	4.9
Dibenz[a,h]anthracene	PAH	11	U	11	11	UN	11	11	U	11	0.545	U	0.545	11	U	11
Fluoranthene	PAH	13	U	13	13	U	13	13	U	13	0.545	U	0.545	13	U	13
Fluorene	PAH	5.2	U	5.2	5.3	U	5.3	5.3	U	5.3	5.11	U	5.11	5.4	U	5.4
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	12	U	12	12	U	12	0.545	U	0.545	12	U	12
Naphthalene	PAH	12	U	12	12	U	12	12	U	12	5.11	U	5.11	12	U	12
Phenanthrene	PAH	12	U	12	12	U	12	12	U	12	5.11	U	5.11	12	U	12
Pyrene	PAH	12	U	12	12	U	12	12	U	12	0.545	U	0.545	12	U	12
Aroclor-1016	PCB	2.6	U	2.6	2.7	U	2.7	2.7	U	2.7	1.13	U	1.13	2.9	U	2.9
Aroclor-1221	PCB	7.5	U	7.5	7.9	U	7.9	7.8	U	7.8	1.13	U	1.13	8.3	U	8.3
Aroclor-1232	PCB	1.9	U	1.9	2.0	U	2.0	2.0	U	2.0	1.13	U	1.13	2.1	U	2.1
Aroclor-1242	PCB	4.3	U	4.3	4.6	U	4.6	4.6	U	4.6	1.13	U	1.13	4.8	U	4.8
Aroclor-1248	PCB	4.3	U	4.3	4.6	U	4.6	4.6	U	4.6	1.13	U	1.13	4.8	U	4.8
Aroclor-1254	PCB	2.4	U	2.4	2.6	U	2.6	2.5	U	2.5	1.13	U	1.13	2.7	U	2.7
Aroclor-1260	PCB	2.4	U	2.4	2.6	U	2.6	2.5	U	2.5	1.13	U	1.13	2.7	U	2.7

CONSTITUENT	CLASS	Duplicate of J1TPN7 - J1TPP4			FS-1 - J1TPN6			FS-3 - J1TPN8			FS-4 - J1TPN9			FS-5 - J1TPP0		
		5/15/14			5/15/14			5/15/14			5/15/14			5/15/14		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Acenaphthene	PAH	11	U	11	10	U	10	10	U	10	10	U	10	10	U	10
Acenaphthylene	PAH	9.6	U	9.6	9.3	U	9.3	9.2	U	9.2	9.3	U	9.3	9.2	U	9.2
Anthracene	PAH	3.2	U	3.2	3.1	U	3.1	3.1	U	3.1	3.2	U	3.2	3.1	U	3.1
Benzo(a)anthracene	PAH	3.4	U	3.4	3.3	U	3.3	3.2	U	3.2	3.3	U	3.3	3.2	U	3.2
Benzo(a)pyrene	PAH	6.8	U	6.8	6.6	U	6.6	6.5	U	6.5	6.6	U	6.6	6.5	U	6.5
Benzo(b)fluoranthene	PAH	4.5	U	4.5	4.3	U	4.3	4.3	U	4.3	4.3	U	4.3	4.3	U	4.3
Benzo(ghi)perylene	PAH	7.6	U	7.6	7.4	U	7.4	7.3	U	7.3	7.4	U	7.4	7.3	U	7.3
Benzo(k)fluoranthene	PAH	4.2	U	4.2	4.1	U	4.1	4.0	U	4.0	4.1	U	4.1	4.0	U	4.0
Chrysene	PAH	5.1	U	5.1	5.0	U	5.0	11	J	4.9	5.0	U	5.0	4.9	U	4.9
Dibenz[a,h]anthracene	PAH	12	U	12	11	U	11	11	U	11	11	U	11	11	U	11
Fluoranthene	PAH	14	U	14	13	U	13	17	J	13	13	U	13	13	U	13
Fluorene	PAH	5.6	U	5.6	5.4	U	5.4	5.4	U	5.4	5.5	U	5.5	5.4	U	5.4
Indeno(1,2,3-cd)pyrene	PAH	13	U	13	12	U	12	12	U	12	12	U	12	12	U	12
Naphthalene	PAH	13	U	13	12	U	12	12	U	12	12	U	12	12	U	12
Phenanthrene	PAH	13	U	13	12	U	12	12	U	12	12	U	12	12	U	12
Pyrene	PAH	13	U	13	12	U	12	20	J	12	12	U	12	12	U	12
Aroclor-1016	PCB	2.9	U	2.9	2.8	U	2.8	2.8	U	2.8	2.7	U	2.7	2.8	U	2.8
Aroclor-1221	PCB	8.4	U	8.4	8.2	U	8.2	8.1	U	8.1	7.8	U	7.8	8.1	U	8.1
Aroclor-1232	PCB	2.1	U	2.1	2.0	U	2.0	2.0	U	2.0	1.9	U	1.9	2.0	U	2.0
Aroclor-1242	PCB	4.9	U	4.9	4.8	U	4.8	4.7	U	4.7	4.5	U	4.5	4.7	U	4.7
Aroclor-1248	PCB	4.9	U	4.9	4.8	U	4.8	4.7	U	4.7	4.5	U	4.5	4.7	U	4.7
Aroclor-1254	PCB	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6
Aroclor-1260	PCB	2.7	U	2.7	2.7	U	2.7	2.6	U	2.6	2.5	U	2.5	2.6	U	2.6

Attachment	1	Sheet No.	5 of 12
Originator	J. D. Skoglie	Date	6/10/14
Checked	I. B. Berezovskiy	Date	6/10/14
Calc. No.	0100N-CA-V0273	Rev. No.	0

Attachment 1. 100-N-93 Waste Site Verification Sample Results (Organics).

CONSTITUENT	CLASS	FS-6 - J1TPP1			FS-7 - J1TPP2			FS-8 - J1TPP3			Split of J1TPN7 - J1TPT3		
		5/15/14			5/15/14			5/15/14			5/15/14		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ng/kg	Q	PQL
Acenaphthene	PAH	9.9	U	9.9	9.6	U	9.6	10	U	10	5.29	U	5.29
Acenaphthylene	PAH	8.9	U	8.9	8.6	U	8.6	9.1	U	9.1	5.29	U	5.29
Anthracene	PAH	3.0	U	3.0	2.9	U	2.9	3.1	U	3.1	1.76	U	1.76
Benzo(a)anthracene	PAH	3.1	U	3.1	3.1	U	3.1	3.2	U	3.2	0.565	U	0.565
Benzo(a)pyrene	PAH	6.3	U	6.3	6.2	U	6.2	6.5	U	6.5	0.565	U	0.565
Benzo(b)fluoranthene	PAH	4.1	U	4.1	4.0	U	4.0	4.2	U	4.2	0.565	U	0.565
Benzo(ghi)perylene	PAH	7.1	U	7.1	6.9	U	6.9	7.3	U	7.3	0.565	U	0.565
Benzo(k)fluoranthene	PAH	3.9	U	3.9	3.8	U	3.8	4.0	U	4.0	0.282	U	0.282
Chrysene	PAH	4.8	U	4.8	4.6	U	4.6	4.9	U	4.9	0.565	U	0.565
Dibenz[a,h]anthracene	PAH	11	U	11	11	U	11	11	U	11	0.565	U	0.565
Fluoranthene	PAH	13	U	13	12	U	12	13	U	13	0.565	U	0.565
Fluorene	PAH	5.2	U	5.2	5.1	U	5.1	5.3	U	5.3	5.29	U	5.29
Indeno(1,2,3-cd)pyrene	PAH	12	U	12	12	U	12	12	U	12	0.565	U	0.565
Naphthalene	PAH	12	U	12	12	U	12	12	U	12	5.29	U	5.29
Phenanthrene	PAH	12	U	12	12	U	12	12	U	12	5.29	U	5.29
Pyrene	PAH	12	U	12	12	U	12	12	U	12	0.565	U	0.565
Aroclor-1016	PCB	2.7	U	2.7	2.7	U	2.7	2.7	U	2.7	1.17	U	1.17
Aroclor-1221	PCB	7.7	U	7.7	7.9	U	7.9	7.9	U	7.9	1.17	U	1.17
Aroclor-1232	PCB	1.9	U	1.9	2.0	U	2.0	2.0	U	2.0	1.17	U	1.17
Aroclor-1242	PCB	4.5	U	4.5	4.6	U	4.6	4.6	U	4.6	1.17	U	1.17
Aroclor-1248	PCB	4.5	U	4.5	4.6	U	4.6	4.6	U	4.6	1.17	U	1.17
Aroclor-1254	PCB	2.5	U	2.5	2.6	U	2.6	2.6	U	2.6	1.17	U	1.17
Aroclor-1260	PCB	2.5	U	2.5	2.6	U	2.6	2.6	U	2.6	1.17	U	1.17

Attachment	1	Sheet No.	6 of 12
Originator	J. D. Skoglie	Date	6/10/14
Checked	I. B. Berezovskiy	Date	6/10/14
Calc. No.	0100N-CA-V0273	Rev. No.	0

Attachment 1. 100-N-93 Waste Site Verification Sample Results (Organics).

CONSTITUENT	CLASS	EXC-7 - J1TPL4			Duplicate of J1TPL4 - J1TPM0			EXC-1 - J1TPK8			EXC-2 - J1TPK9			EXC-3 - J1TPL0		
		5/15/14			5/15/14			5/15/14			5/15/14			5/15/14		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	26	U	26	27	U	27	28	U	28	28	U	28
1,2-Dichlorobenzene	SVOA	22	U	22	21	U	21	21	U	21	22	U	22	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12	11	U	11	11	U	11	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	14	U	14	13	U	13	13	U	13	13	U	13	13	U	13
2,4,5-Trichlorophenol	SVOA	10	U	10	9.3	U	9.3	9.5	U	9.5	9.9	U	9.9	9.8	U	9.8
2,4,6-Trichlorophenol	SVOA	10	U	10	9.3	U	9.3	9.5	U	9.5	9.9	U	9.9	9.8	U	9.8
2,4-Dichlorophenol	SVOA	10	U	10	9.3	U	9.3	9.5	U	9.5	9.9	U	9.9	9.8	U	9.8
2,4-Dimethylphenol	SVOA	67	U	67	62	U	62	63	U	63	65	U	65	65	U	65
2,4-Dinitrophenol	SVOA	340	UJ	340	310	UJ	310	320	UJX	320	330	UJ	330	330	UJ	330
2,4-Dinitrotoluene	SVOA	67	U	67	62	U	62	63	U	63	65	U	65	65	U	65
2,6-Dinitrotoluene	SVOA	28	U	28	26	U	26	27	U	27	28	U	28	28	U	28
2-Chloronaphthalene	SVOA	10	U	10	9.3	U	9.3	9.5	U	9.5	9.9	U	9.9	9.8	U	9.8
2-Chlorophenol	SVOA	21	U	21	20	U	20	20	U	20	21	U	21	21	U	21
2-Methylnaphthalene	SVOA	19	U	19	18	U	18	18	U	18	19	U	19	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	12	U	12	12	U	12	13	U	13	13	U	13
2-Nitroaniline	SVOA	51	U	51	47	U	47	47	U	47	49	U	49	49	U	49
2-Nitrophenol	SVOA	10	U	10	9.3	U	9.3	9.5	U	9.5	9.9	U	9.9	9.8	U	9.8
3,3'-Dichlorobenzidine	SVOA	91	U	91	84	U	84	85	U	85	89	U	89	89	U	89
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	31	U	31	31	U	31	33	U	33	32	U	32
3-Nitroaniline	SVOA	74	U	74	68	U	68	69	U	69	72	U	72	72	U	72
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	310	U	310	310	U	310	330	U	330	320	U	320
4-Bromophenylphenyl ether	SVOA	19	U	19	18	U	18	18	U	18	19	U	19	19	U	19
4-Chloro-3-methylphenol	SVOA	67	U	67	62	U	62	63	U	63	65	U	65	65	U	65
4-Chloroaniline	SVOA	83	U	83	77	U	77	78	U	78	81	U	81	81	U	81
4-Chlorophenylphenyl ether	SVOA	21	U	21	20	U	20	20	U	20	21	U	21	21	U	21
4-Nitroaniline	SVOA	73	U	73	68	U	68	69	U	69	72	U	72	71	U	71
4-Nitrophenol	SVOA	98	U	98	91	U	91	92	U	92	96	U	96	95	U	95
Acenaphthene	SVOA	10	U	10	9.6	U	9.6	9.8	U	9.8	10	U	10	10	U	10
Acenaphthylene	SVOA	17	U	17	16	U	16	16	U	16	17	U	17	17	U	17
Anthracene	SVOA	17	U	17	16	U	16	16	U	16	17	U	17	17	U	17
Benzo(a)anthracene	SVOA	20	U	20	19	U	19	19	U	19	20	U	20	20	U	20
Benzo(a)pyrene	SVOA	20	U	20	19	U	19	19	U	19	20	U	20	20	U	20
Benzo(b)fluoranthene	SVOA	27	U	27	24	U	24	25	U	25	26	U	26	26	U	26
Benzo(ghi)perylene	SVOA	16	U	16	15	U	15	15	U	15	16	U	16	16	U	16
Benzo(k)fluoranthene	SVOA	41	U	41	37	U	37	38	U	38	39	U	39	39	U	39
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	21	U	21	22	U	22	23	U	23	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	21	U	21	22	U	22	23	U	23	23	U	23
Bis(2-chloroethyl) ether	SVOA	17	U	17	16	U	16	16	U	16	16	U	16	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	47	U	47	43	U	43	44	U	44	45	U	45	45	U	45
Butylbenzylphthalate	SVOA	44	U	44	40	U	40	41	U	41	42	U	42	42	U	42
Carbazole	SVOA	36	U	36	34	U	34	34	U	34	36	U	36	35	U	35
Chrysene	SVOA	27	U	27	25	U	25	26	U	26	27	U	27	27	U	27
Dibenz[a,h]anthracene	SVOA	19	U	19	18	U	18	18	U	18	19	U	19	19	U	19
Dibenzofuran	SVOA	20	U	20	19	U	19	19	U	19	20	U	20	20	U	20
Diethyl phthalate	SVOA	26	U	26	24	U	24	25	U	25	26	U	26	26	U	26
Dimethyl phthalate	SVOA	23	U	23	21	U	21	22	U	22	23	U	23	23	U	23
Di-n-butylphthalate	SVOA	29	U	29	27	U	27	28	U	28	29	U	29	29	U	29
Di-n-octylphthalate	SVOA	15	U	15	13	U	13	14	U	14	14	U	14	14	U	14
Diphenylamine	SVOA															
Fluoranthene	SVOA	36	U	36	34	U	34	34	U	34	36	U	36	35	U	35
Fluorene	SVOA	18	U	18	17	U	17	17	U	17	18	U	18	18	U	18
Hexachlorobenzene	SVOA	29	U	29	27	U	27	28	U	28	29	U	29	29	U	29
Hexachlorobutadiene	SVOA	10	U	10	9.3	U	9.3	9.5	U	9.5	9.9	U	9.9	9.8	U	9.8
Hexachlorocyclopentadiene	SVOA	51	U	51	47	U	47	47	U	47	49	U	49	49	U	49
Hexachloroethane	SVOA	22	U	22	20	U	20	20	U	20	21	U	21	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	21	U	21	21	U	21	22	U	22	22	U	22
Isophorone	SVOA	17	U	17	16	U	16	16	U	16	17	U	17	17	U	17
Naphthalene	SVOA	31	U	31	29	U	29	29	U	29	31	U	31	31	U	31
Nitrobenzene	SVOA	22	U	22	21	U	21	21	U	21	22	U	22	22	U	22
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	29	U	29	29	U	29	31	U	31	31	U	31
N-Nitrosodiphenylamine	SVOA	21	U	21	20	U	20	20	U	20	21	U	21	21	U	21
Pentachlorophenol	SVOA	330	U	330	310	U	310	310	U	310	330	U	330	320	U	320
Phenanthrene	SVOA	17	U	17	16	U	16	16	U	16	17	U	17	17	U	17
Phenol	SVOA	18	U	18	17	U	17	17	U	17	18	U	18	18	U	18
Pyrene	SVOA	12	U	12	11	U	11	11	U	11	12	U	12	12	U	12

Attachment	1	Sheet No.	7 of 12
Originator	J. D. Skoglie	Date	6/10/14
Checked	I. B. Berezovskiy	Date	6/10/14
Calc. No.	0100N-CA-V0273	Rev. No.	0

Attachment 1. 100-N-93 Waste Site Verification Sample Results (Organics).

CONSTITUENT	CLASS	EXC-4 - J1TPL1			EXC-5 - J1TPL2			EXC-6 - J1TPL3			EXC-8 - J1TPL5			EXC-9 - J1TPL6		
		5/15/14			5/15/14			5/15/14			5/15/14			5/15/14		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	28	U	28	28	U	28	27	U	27	29	U	29
1,2-Dichlorobenzene	SVOA	22	U	22	22	U	22	22	U	22	22	U	22	23	U	23
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	14	U	14	14	U	14	14	U	14	13	U	13	14	U	14
2,4,5-Trichlorophenol	SVOA	10	U	10	10	U	10	10	U	10	9.8	U	9.8	10	U	10
2,4,6-Trichlorophenol	SVOA	10	U	10	10	U	10	10	U	10	9.8	U	9.8	10	U	10
2,4-Dichlorophenol	SVOA	10	U	10	10	U	10	10	U	10	9.8	U	9.8	10	U	10
2,4-Dimethylphenol	SVOA	66	U	66	67	U	67	67	U	67	65	U	65	69	U	69
2,4-Dinitrophenol	SVOA	330	UJ	330	340	UJ	340	340	UJ	340	330	UJ	330	350	UJ	350
2,4-Dinitrotoluene	SVOA	66	U	66	67	U	67	67	U	67	65	U	65	69	U	69
2,6-Dinitrotoluene	SVOA	28	U	28	28	U	28	28	U	28	27	U	27	29	U	29
2-Chloronaphthalene	SVOA	10	U	10	10	U	10	10	U	10	9.8	U	9.8	10	U	10
2-Chlorophenol	SVOA	21	U	21	21	U	21	21	U	21	21	U	21	22	U	22
2-Methylnaphthalene	SVOA	19	U	19	19	U	19	19	U	19	19	U	19	20	U	20
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	13	U	13	14	U	14
2-Nitroaniline	SVOA	50	U	50	50	U	50	51	U	51	49	U	49	52	U	52
2-Nitrophenol	SVOA	10	U	10	10	U	10	10	U	10	9.8	U	9.8	10	U	10
3,3'-Dichlorobenzidine	SVOA	90	U	90	91	U	91	91	U	91	88	U	88	94	U	94
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	33	U	33	33	U	33	32	U	32	34	U	34
3-Nitroaniline	SVOA	73	U	73	74	U	74	74	U	74	72	U	72	76	U	76
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	330	U	330	330	U	330	320	U	320	340	U	340
4-Bromophenylphenyl ether	SVOA	19	U	19	19	U	19	19	U	19	19	U	19	20	U	20
4-Chloro-3-methylphenol	SVOA	66	U	66	67	U	67	67	U	67	65	U	65	69	U	69
4-Chloroaniline	SVOA	82	U	82	83	U	83	83	U	83	80	U	80	85	U	85
4-Chlorophenylphenyl ether	SVOA	21	U	21	21	U	21	21	U	21	21	U	21	22	U	22
4-Nitroaniline	SVOA	72	U	72	73	U	73	73	U	73	71	U	71	75	U	75
4-Nitrophenol	SVOA	97	U	97	98	U	98	98	U	98	95	U	95	100	U	100
Acenaphthene	SVOA	10	U	10	10	U	10	10	U	10	10	U	10	11	U	11
Acenaphthylene	SVOA	17	U	17	17	U	17	17	U	17	17	U	17	18	U	18
Anthracene	SVOA	17	U	17	17	U	17	17	U	17	17	U	17	18	U	18
Benzo(a)anthracene	SVOA	20	U	20	20	U	20	20	U	20	20	U	20	21	U	21
Benzo(a)pyrene	SVOA	20	U	20	20	U	20	20	U	20	20	U	20	21	U	21
Benzo(b)fluoranthene	SVOA	26	U	26	26	U	26	27	U	27	26	U	26	27	U	27
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	16	U	16	16	U	16	17	U	17
Benzo(k)fluoranthene	SVOA	40	U	40	40	U	40	40	U	40	39	U	39	42	U	42
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	23	U	23	23	U	23	23	U	23	24	U	24
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	23	U	23	23	U	23	23	U	23	24	U	24
Bis(2-chloroethyl) ether	SVOA	17	U	17	17	U	17	17	U	17	16	U	16	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	46	U	46	46	U	46	47	U	47	45	U	45	48	U	48
Butylbenzylphthalate	SVOA	43	U	43	43	U	43	44	U	44	42	U	42	45	U	45
Carbazole	SVOA	36	U	36	36	U	36	36	U	36	35	U	35	37	U	37
Chrysene	SVOA	27	U	27	27	U	27	27	U	27	26	U	26	28	U	28
Dibenz[a,h]anthracene	SVOA	19	U	19	19	U	19	19	U	19	19	U	19	20	U	20
Dibenzofuran	SVOA	20	U	20	20	U	20	20	U	20	20	U	20	21	U	21
Diethyl phthalate	SVOA	26	U	26	26	U	26	26	U	26	25	U	25	27	U	27
Dimethyl phthalate	SVOA	35	J	23	23	U	23	23	U	23	24	J	23	24	U	24
Di-n-butylphthalate	SVOA	29	U	29	29	U	29	29	U	29	28	U	28	30	U	30
Di-n-octylphthalate	SVOA	14	U	14	15	U	15	15	U	15	14	U	14	15	U	15
Diphenylamine	SVOA															
Fluoranthene	SVOA	36	U	36	36	U	36	36	U	36	35	U	35	37	U	37
Fluorene	SVOA	18	U	18	18	U	18	18	U	18	18	U	18	19	U	19
Hexachlorobenzene	SVOA	29	U	29	29	U	29	29	U	29	28	U	28	30	U	30
Hexachlorobutadiene	SVOA	10	U	10	10	U	10	10	U	10	9.8	U	9.8	10	U	10
Hexachlorocyclopentadiene	SVOA	50	U	50	50	U	50	51	U	51	49	U	49	52	U	52
Hexachloroethane	SVOA	21	U	21	21	U	21	22	U	22	21	U	21	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	22	U	22	22	U	22	22	U	22	23	U	23
Isophorone	SVOA	17	U	17	17	U	17	17	U	17	17	U	17	18	U	18
Naphthalene	SVOA	31	U	31	31	U	31	31	U	31	30	U	30	32	U	32
Nitrobenzene	SVOA	22	U	22	22	U	22	22	U	22	22	U	22	23	U	23
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	31	U	31	31	U	31	30	U	30	32	U	32
N-Nitrosodiphenylamine	SVOA	21	U	21	21	U	21	21	U	21	21	U	21	22	U	22
Pentachlorophenol	SVOA	330	U	330	330	U	330	330	U	330	320	U	320	340	U	340
Phenanthrene	SVOA	17	U	17	17	U	17	17	U	17	17	U	17	18	U	18
Phenol	SVOA	18	U	18	18	U	18	18	U	18	18	U	18	19	U	19
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	13	U	13

Attachment	1	Sheet No.	8 of 12
Originator	J. D. Skoglie	Date	6/10/14
Checked	I. B. Berezovskiy	Date	6/10/14
Calc. No.	0100N-CA-V0273	Rev. No.	0

Attachment 1. 100-N-93 Waste Site Verification Sample Results (Organics).

CONSTITUENT	CLASS	EXC-10 - J1TPL7			EXC-11 - J1TPL8			EXC-12 - J1TPL9			Split of J1TPL4 - J1TPN4			FS-2 - J1TPN7		
		5/15/14			5/15/14			5/15/14			5/15/14			5/15/14		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	27	U	27	28	U	28	28	U	28	102	U	102	29	U	29
1,2-Dichlorobenzene	SVOA	22	U	22	22	U	22	22	U	22	102	U	102	23	U	23
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	102	U	102	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	13	U	13	14	U	14	102	U	102	14	U	14
2,4,5-Trichlorophenol	SVOA	9.8	U	9.8	9.9	U	9.9	10	U	10	102	U	102	10	U	10
2,4,6-Trichlorophenol	SVOA	9.8	U	9.8	9.9	U	9.9	10	U	10	102	U	102	10	U	10
2,4-Dichlorophenol	SVOA	9.8	U	9.8	9.9	U	9.9	10	U	10	102	U	102	10	U	10
2,4-Dimethylphenol	SVOA	65	U	65	65	U	65	67	U	67	102	U	102	68	U	68
2,4-Dinitrophenol	SVOA	330	UJ	330	330	UJ	330	340	UJ	340	102	U	102	340	U	340
2,4-Dinitrotoluene	SVOA	65	U	65	65	U	65	67	U	67	102	U	102	68	U	68
2,6-Dinitrotoluene	SVOA	27	U	27	28	U	28	28	U	28	102	U	102	29	U	29
2-Chloronaphthalene	SVOA	9.8	U	9.8	9.9	U	9.9	10	U	10	10.2	U	10.2	10	U	10
2-Chlorophenol	SVOA	21	U	21	21	U	21	21	U	21	102	U	102	22	U	22
2-Methylnaphthalene	SVOA	19	U	19	19	U	19	19	U	19	10.2	U	10.2	20	U	20
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	102	U	102	13	U	13
2-Nitroaniline	SVOA	49	U	49	49	U	49	51	U	51	112	U	112	52	U	52
2-Nitrophenol	SVOA	9.8	U	9.8	9.9	U	9.9	10	U	10	102	U	102	10	U	10
3,3'-Dichlorobenzidine	SVOA	88	U	88	89	U	89	91	U	91	102	U	102	93	U	93
3+4 Methylphenol (cresol, m+p)	SVOA	32	U	32	33	U	33	33	U	33	102	U	102	34	U	34
3-Nitroaniline	SVOA	72	U	72	72	U	72	74	U	74	102	U	102	75	U	75
4,6-Dinitro-2-methylphenol	SVOA	320	U	320	330	U	330	330	U	330	102	U	102	340	U	340
4-Bromophenylphenyl ether	SVOA	19	U	19	19	U	19	19	U	19	102	U	102	20	U	20
4-Chloro-3-methylphenol	SVOA	65	U	65	65	U	65	67	U	67	135	U	135	68	U	68
4-Chloroaniline	SVOA	80	U	80	81	U	81	83	U	83	102	U	102	85	U	85
4-Chlorophenylphenyl ether	SVOA	21	U	21	21	U	21	21	U	21	102	U	102	22	U	22
4-Nitroaniline	SVOA	71	U	71	72	U	72	74	U	74	102	U	102	75	U	75
4-Nitrophenol	SVOA	95	U	95	96	U	96	98	U	98	102	U	102	100	U	100
Acenaphthene	SVOA	10	U	10	10	U	10	10	U	10	10.2	U	10.2	11	U	11
Acenaphthylene	SVOA	17	U	17	17	U	17	17	U	17	10.2	U	10.2	18	U	18
Anthracene	SVOA	17	U	17	17	U	17	17	U	17	10.2	U	10.2	18	U	18
Benzo(a)anthracene	SVOA	20	U	20	20	U	20	20	U	20	10.2	U	10.2	21	U	21
Benzo(a)pyrene	SVOA	20	U	20	20	U	20	20	U	20	10.2	U	10.2	21	U	21
Benzo(b)fluoranthene	SVOA	26	U	26	26	U	26	27	U	27	10.2	U	10.2	27	U	27
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	16	U	16	10.2	U	10.2	17	U	17
Benzo(k)fluoranthene	SVOA	39	U	39	39	U	39	41	U	41	10.2	U	10.2	41	U	41
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	23	U	23	23	U	23	102	U	102	24	U	24
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	23	U	23	23	U	23	102	U	102	24	U	24
Bis(2-chloroethyl) ether	SVOA	16	U	16	16	U	16	17	U	17	102	U	102	17	U	17
Bis(2-ethylhexyl) phthalate	SVOA	45	U	45	45	U	45	47	U	47	102	U	102	47	U	47
Butylbenzylphthalate	SVOA	42	U	42	42	U	42	44	U	44	102	U	102	44	U	44
Carbazole	SVOA	35	U	35	36	U	36	36	U	36	10.2	U	10.2	37	U	37
Chrysene	SVOA	27	U	27	27	U	27	27	U	27	10.2	U	10.2	28	U	28
Dibenz[a,h]anthracene	SVOA	19	U	19	19	U	19	19	U	19	10.2	U	10.2	20	U	20
Dibenzofuran	SVOA	20	U	20	20	U	20	20	U	20	102	U	102	21	U	21
Diethyl phthalate	SVOA	26	U	26	26	U	26	26	U	26	102	U	102	27	U	27
Dimethyl phthalate	SVOA	23	U	23	23	U	23	23	U	23	102	U	102	24	U	24
Di-n-butylphthalate	SVOA	28	U	28	29	U	29	29	U	29	102	U	102	30	U	30
Di-n-octylphthalate	SVOA	14	U	14	14	U	14	15	U	15	102	U	102	15	U	15
Diphenylamine	SVOA										102	U	102			
Fluoranthene	SVOA	35	U	35	36	U	36	36	U	36	10.2	U	10.2	37	U	37
Fluorene	SVOA	18	U	18	18	U	18	18	U	18	10.2	U	10.2	19	U	19
Hexachlorobenzene	SVOA	28	U	28	29	U	29	29	U	29	102	U	102	30	U	30
Hexachlorobutadiene	SVOA	9.8	U	9.8	9.9	U	9.9	10	U	10	102	U	102	10	U	10
Hexachlorocyclopentadiene	SVOA	49	U	49	49	U	49	51	U	51	102	U	102	52	U	52
Hexachloroethane	SVOA	21	U	21	21	U	21	22	U	22	102	U	102	22	U	22
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	22	U	22	22	U	22	10.2	U	10.2	23	U	23
Isophorone	SVOA	17	U	17	17	U	17	17	U	17	102	U	102	18	U	18
Naphthalene	SVOA	30	U	30	31	U	31	31	U	31	10.2	U	10.2	32	U	32
Nitrobenzene	SVOA	22	U	22	22	U	22	22	U	22	102	U	102	23	U	23
N-Nitroso-di-n-dipropylamine	SVOA	30	U	30	31	U	31	31	U	31	102	U	102	32	U	32
N-Nitrosodiphenylamine	SVOA	21	U	21	21	U	21	21	U	21				22	U	22
Pentachlorophenol	SVOA	320	U	320	330	U	330	330	U	330	102	U	102	340	U	340
Phenanthrene	SVOA	17	U	17	17	U	17	17	U	17	10.2	U	10.2	18	U	18
Phenol	SVOA	18	U	18	18	U	18	18	U	18	102	U	102	19	U	19
Pyrene	SVOA	12	U	12	12	U	12	12	U	12	10.2	U	10.2	12	U	12

Attachment	1	Sheet No.	9 of 12
Originator	J. D. Skoglie	Date	6/10/14
Checked	I. B. Berezovskiy	Date	6/10/14
Calc. No.	0100N-CA-V0273	Rev. No.	0

Attachment 1. 100-N-93 Waste Site Verification Sample Results (Organics).

CONSTITUENT	CLASS	Duplicate of J1TPN7 - J1TPP4			FS-1 - J1TPN6			FS-3 - J1TPN8			FS-4 - J1TPN9			FS-5 - J1TPP0		
		5/15/14			5/15/14			5/15/14			5/15/14			5/15/14		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	29	U	29	27	U	27	27	U	27	28	U	28
1,2-Dichlorobenzene	SVOA	22	U	22	23	U	23	21	U	21	21	U	21	22	U	22
1,3-Dichlorobenzene	SVOA	12	U	12	12	U	12	12	U	12	12	U	12	12	U	12
1,4-Dichlorobenzene	SVOA	13	U	13	14	U	14	13	U	13	13	U	13	13	U	13
2,4,5-Trichlorophenol	SVOA	9.9	U	9.9	10	U	10	9.6	U	9.6	9.6	U	9.6	9.9	U	9.9
2,4,6-Trichlorophenol	SVOA	9.9	U	9.9	10	U	10	9.6	U	9.6	9.6	U	9.6	9.9	U	9.9
2,4-Dichlorophenol	SVOA	9.9	U	9.9	10	U	10	9.6	U	9.6	9.6	U	9.6	9.9	U	9.9
2,4-Dimethylphenol	SVOA	65	U	65	68	U	68	64	U	64	64	U	64	65	U	65
2,4-Dinitrophenol	SVOA	330	U	330	340	U	340	320	U	320	320	U	320	330	U	330
2,4-Dinitrotoluene	SVOA	65	U	65	68	U	68	64	U	64	64	U	64	65	U	65
2,6-Dinitrotoluene	SVOA	28	U	28	29	U	29	27	U	27	27	U	27	28	U	28
2-Chloronaphthalene	SVOA	9.9	U	9.9	10	U	10	9.6	U	9.6	9.6	U	9.6	9.9	U	9.9
2-Chlorophenol	SVOA	21	U	21	22	U	22	20	U	20	20	U	20	21	U	21
2-Methylnaphthalene	SVOA	19	U	19	20	U	20	18	U	18	18	U	18	19	U	19
2-Methylphenol (cresol, o-)	SVOA	13	U	13	13	U	13	13	U	13	13	U	13	13	U	13
2-Nitroaniline	SVOA	49	U	49	51	U	51	48	U	48	48	U	48	50	U	50
2-Nitrophenol	SVOA	9.9	U	9.9	10	U	10	9.6	U	9.6	9.6	U	9.6	9.9	U	9.9
3,3'-Dichlorobenzidine	SVOA	89	U	89	93	U	93	87	U	87	87	U	87	89	U	89
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	34	U	34	32	U	32	32	U	32	33	U	33
3-Nitroaniline	SVOA	72	U	72	75	U	75	70	U	70	70	U	70	72	U	72
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	340	U	340	320	U	320	320	U	320	330	U	330
4-Bromophenylphenyl ether	SVOA	19	U	19	20	U	20	18	U	18	18	U	18	19	U	19
4-Chloro-3-methylphenol	SVOA	65	U	65	68	U	68	64	U	64	64	U	64	65	U	65
4-Chloroaniline	SVOA	81	U	81	84	U	84	79	U	79	79	U	79	81	U	81
4-Chlorophenylphenyl ether	SVOA	21	U	21	22	U	22	20	U	20	20	U	20	21	U	21
4-Nitroaniline	SVOA	72	U	72	75	U	75	70	U	70	70	U	70	72	U	72
4-Nitrophenol	SVOA	96	U	96	100	U	100	94	U	94	94	U	94	96	U	96
Acenaphthene	SVOA	10	U	10	11	U	11	9.9	U	9.9	9.9	U	9.9	10	U	10
Acenaphthylene	SVOA	17	U	17	18	U	18	16	U	16	16	U	16	17	U	17
Anthracene	SVOA	17	U	17	18	U	18	16	U	16	16	U	16	17	U	17
Benzo(a)anthracene	SVOA	20	U	20	21	U	21	29	J	19	19	U	19	20	U	20
Benzo(a)pyrene	SVOA	20	U	20	21	U	21	21	J	19	19	U	19	20	U	20
Benzo(b)fluoranthene	SVOA	26	U	26	27	U	27	25	U	25	25	U	25	26	U	26
Benzo(ghi)perylene	SVOA	16	U	16	16	U	16	15	U	15	15	U	15	16	U	16
Benzo(k)fluoranthene	SVOA	39	U	39	41	U	41	39	U	39	39	U	39	40	U	40
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	24	U	24	22	U	22	22	U	22	23	U	23
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	24	U	24	22	U	22	22	U	22	23	U	23
Bis(2-chloroethyl) ether	SVOA	16	U	16	17	U	17	16	U	16	16	U	16	16	U	16
Bis(2-ethylhexyl) phthalate	SVOA	45	U	45	47	U	47	44	U	44	44	U	44	46	U	46
Butylbenzylphthalate	SVOA	42	U	42	44	U	44	41	U	41	41	U	41	43	U	43
Carbazole	SVOA	36	U	36	37	U	37	35	U	35	35	U	35	36	U	36
Chrysene	SVOA	27	U	27	28	U	28	36	J	26	26	U	26	27	U	27
Dibenz[a,h]anthracene	SVOA	19	U	19	20	U	20	18	U	18	18	U	18	19	U	19
Dibenzofuran	SVOA	20	U	20	21	U	21	19	U	19	19	U	19	20	U	20
Diethyl phthalate	SVOA	26	U	26	27	U	27	25	U	25	25	U	25	26	U	26
Dimethyl phthalate	SVOA	23	U	23	24	U	24	22	U	22	22	U	22	23	U	23
Di-n-butylphthalate	SVOA	29	U	29	30	U	30	28	U	28	28	U	28	29	U	29
Di-n-octylphthalate	SVOA	14	U	14	15	U	15	14	U	14	14	U	14	14	U	14
Diphenylamine	SVOA															
Fluoranthene	SVOA	36	U	36	37	U	37	53	J	35	35	U	35	36	U	36
Fluorene	SVOA	18	U	18	19	U	19	17	U	17	17	U	17	18	U	18
Hexachlorobenzene	SVOA	29	U	29	30	U	30	28	U	28	28	U	28	29	U	29
Hexachlorobutadiene	SVOA	9.9	U	9.9	10	U	10	9.6	U	9.6	9.6	U	9.6	9.9	U	9.9
Hexachlorocyclopentadiene	SVOA	49	U	49	51	U	51	48	U	48	48	U	48	50	U	50
Hexachloroethane	SVOA	21	U	21	22	U	22	21	U	21	21	U	21	21	U	21
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	23	U	23	21	U	21	21	U	21	22	U	22
Isophorone	SVOA	17	U	17	18	U	18	16	U	16	16	U	16	17	U	17
Naphthalene	SVOA	31	U	31	32	U	32	30	U	30	30	U	30	31	U	31
Nitrobenzene	SVOA	22	U	22	23	U	23	21	U	21	21	U	21	22	U	22
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	32	U	32	30	U	30	30	U	30	31	U	31
N-Nitrosodiphenylamine	SVOA	21	U	21	22	U	22	20	U	20	20	U	20	21	U	21
Pentachlorophenol	SVOA	330	U	330	340	U	340	320	U	320	320	U	320	330	U	330
Phenanthrene	SVOA	17	U	17	18	U	18	38	J	16	16	U	16	17	U	17
Phenol	SVOA	18	U	18	19	U	19	17	U	17	17	U	17	18	U	18
Pyrene	SVOA	12	U	12	12	U	12	59	J	12	12	U	12	12	U	12

Attachment	1	Sheet No.	10 of 12
Originator	J. D. Skoglie	Date	6/10/14
Checked	I. B. Berezovskiy	Date	6/10/14
Calc. No.	0100N-CA-V0273	Rev. No.	0

Attachment 1. 100-N-93 Waste Site Verification Sample Results (Organics).

CONSTITUENT	CLASS	FS-6 - J1TPP1			FS-7 - J1TPP2			FS-8 - J1TPP3			Split of J1TPN7 - J1TPT3		
		5/15/14			5/15/14			5/15/14			5/15/14		
		ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
1,2,4-Trichlorobenzene	SVOA	28	U	28	26	U	26	28	U	28	106	U	106
1,2-Dichlorobenzene	SVOA	22	U	22	20	U	20	22	U	22	106	U	106
1,3-Dichlorobenzene	SVOA	12	U	12	11	U	11	12	U	12	106	U	106
1,4-Dichlorobenzene	SVOA	14	U	14	13	U	13	14	U	14	106	U	106
2,4,5-Trichlorophenol	SVOA	10	U	10	9.2	U	9.2	9.9	U	9.9	106	U	106
2,4,6-Trichlorophenol	SVOA	10	U	10	9.2	U	9.2	9.9	U	9.9	106	U	106
2,4-Dichlorophenol	SVOA	10	U	10	9.2	U	9.2	9.9	U	9.9	106	U	106
2,4-Dimethylphenol	SVOA	67	U	67	61	U	61	66	U	66	106	U	106
2,4-Dinitrophenol	SVOA	340	U	340	310	U	310	330	U	330	106	U	106
2,4-Dinitrotoluene	SVOA	67	U	67	61	U	61	66	U	66	106	U	106
2,6-Dinitrotoluene	SVOA	28	U	28	26	U	26	28	U	28	106	U	106
2-Chloronaphthalene	SVOA	10	U	10	9.2	U	9.2	9.9	U	9.9	10.6	U	10.6
2-Chlorophenol	SVOA	21	U	21	19	U	19	21	U	21	106	U	106
2-Methylnaphthalene	SVOA	19	U	19	18	U	18	19	U	19	10.6	U	10.6
2-Methylphenol (cresol, o-)	SVOA	13	U	13	12	U	12	13	U	13	106	U	106
2-Nitroaniline	SVOA	51	U	51	46	U	46	50	U	50	116	U	116
2-Nitrophenol	SVOA	10	U	10	9.2	U	9.2	9.9	U	9.9	106	U	106
3,3'-Dichlorobenzidine	SVOA	91	U	91	83	U	83	90	U	90	106	U	106
3+4 Methylphenol (cresol, m+p)	SVOA	33	U	33	30	U	30	33	U	33	106	U	106
3-Nitroaniline	SVOA	74	U	74	67	U	67	73	U	73	106	U	106
4,6-Dinitro-2-methylphenol	SVOA	330	U	330	300	U	300	330	U	330	106	U	106
4-Bromophenylphenyl ether	SVOA	19	U	19	18	U	18	19	U	19	106	U	106
4-Chloro-3-methylphenol	SVOA	67	U	67	61	U	61	66	U	66	141	U	141
4-Chloroaniline	SVOA	83	U	83	75	U	75	81	U	81	106	U	106
4-Chlorophenylphenyl ether	SVOA	21	U	21	19	U	19	21	U	21	106	U	106
4-Nitroaniline	SVOA	73	U	73	67	U	67	72	U	72	106	U	106
4-Nitrophenol	SVOA	98	U	98	89	U	89	96	U	96	106	U	106
Acenaphthene	SVOA	10	U	10	9.5	U	9.5	10	U	10	10.6	U	10.6
Acenaphthylene	SVOA	17	U	17	16	U	16	17	U	17	10.6	U	10.6
Anthracene	SVOA	17	U	17	16	U	16	17	U	17	10.6	U	10.6
Benzo(a)anthracene	SVOA	20	U	20	18	U	18	20	U	20	10.6	U	10.6
Benzo(a)pyrene	SVOA	20	U	20	18	U	18	20	U	20	10.6	U	10.6
Benzo(b)fluoranthene	SVOA	26	U	26	24	U	24	26	U	26	10.6	U	10.6
Benzo(ghi)perylene	SVOA	16	U	16	15	U	15	16	U	16	10.6	U	10.6
Benzo(k)fluoranthene	SVOA	40	U	40	37	U	37	40	U	40	10.6	U	10.6
Bis(2-chloro-1-methylethyl)ether	SVOA	23	U	23	21	U	21	23	U	23	106	U	106
Bis(2-Chloroethoxy)methane	SVOA	23	U	23	21	U	21	23	U	23	106	U	106
Bis(2-chloroethyl) ether	SVOA	17	U	17	15	U	15	17	U	17	106	U	106
Bis(2-ethylhexyl) phthalate	SVOA	46	U	46	42	U	42	46	U	46	106	U	106
Butylbenzylphthalate	SVOA	43	U	43	40	U	40	43	U	43	106	U	106
Carbazole	SVOA	36	U	36	33	U	33	36	U	36	10.6	U	10.6
Chrysene	SVOA	27	U	27	25	U	25	27	U	27	10.6	U	10.6
Dibenz[a,h]anthracene	SVOA	19	U	19	18	U	18	19	U	19	10.6	U	10.6
Dibenzofuran	SVOA	20	U	20	18	U	18	20	U	20	106	U	106
Diethyl phthalate	SVOA	26	U	26	24	U	24	26	U	26	106	U	106
Dimethyl phthalate	SVOA	23	U	23	21	U	21	23	U	23	106	U	106
Di-n-butylphthalate	SVOA	29	U	29	27	U	27	29	U	29	106	U	106
Di-n-octylphthalate	SVOA	15	U	15	13	U	13	14	U	14	106	U	106
Diphenylamine	SVOA										106	U	106
Fluoranthene	SVOA	36	U	36	33	U	33	36	U	36	10.6	U	10.6
Fluorene	SVOA	18	U	18	17	U	17	18	U	18	10.6	U	10.6
Hexachlorobenzene	SVOA	29	U	29	27	U	27	29	U	29	106	U	106
Hexachlorobutadiene	SVOA	10	U	10	9.2	U	9.2	9.9	U	9.9	106	U	106
Hexachlorocyclopentadiene	SVOA	51	U	51	46	U	46	50	U	50	106	U	106
Hexachloroethane	SVOA	22	U	22	20	U	20	21	U	21	106	U	106
Indeno(1,2,3-cd)pyrene	SVOA	22	U	22	20	U	20	22	U	22	10.6	U	10.6
Isophorone	SVOA	17	U	17	16	U	16	17	U	17	106	U	106
Naphthalene	SVOA	31	U	31	29	U	29	31	U	31	10.6	U	10.6
Nitrobenzene	SVOA	22	U	22	20	U	20	22	U	22	106	U	106
N-Nitroso-di-n-dipropylamine	SVOA	31	U	31	29	U	29	31	U	31	106	U	106
N-Nitrosodiphenylamine	SVOA	21	U	21	19	U	19	21	U	21			
Pentachlorophenol	SVOA	330	U	330	300	U	300	330	U	330	106	U	106
Phenanthrene	SVOA	17	U	17	16	U	16	17	U	17	10.6	U	10.6
Phenol	SVOA	18	U	18	17	U	17	18	U	18	106	U	106
Pyrene	SVOA	12	U	12	11	U	11	12	U	12	10.6	U	10.6

Attachment	1	Sheet No.	11 of 12
Originator	J. D. Skoglie	Date	6/10/14
Checked	I. B. Berezovskiy	Date	6/10/14
Calc. No.	0100N-CA-V0273	Rev. No.	0

Attachment 1. 100-N-93 Waste Site Verification Sample Results (Asbestos) [a].

Sample Location	HEIS Number	Sample Date	Chrysotile	Amosite	Crocidolite	Tremolite	Actinolite	Anthophyllite
			%	%	%	%	%	%
EXC-7	J1TPM7	5/15/14	ND	ND	ND	ND	ND	ND
Duplicate of J1TPL4	J1TPN3	5/15/14	ND	ND	ND	ND	ND	ND
EXC-1	J1TPM1	5/15/14	ND	ND	ND	ND	ND	ND
EXC-2	J1TPM2	5/15/14	ND	ND	ND	ND	ND	ND
EXC-3	J1TPM3	5/15/14	ND	ND	ND	ND	ND	ND
EXC-4	J1TPM4	5/15/14	ND	ND	ND	ND	ND	ND
EXC-5	J1TPM5	5/15/14	ND	ND	ND	ND	ND	ND
EXC-6	J1TPM6	5/15/14	ND	ND	ND	ND	ND	ND
EXC-8	J1TPM8	5/15/14	ND	ND	ND	ND	ND	ND
EXC-9	J1TPM9	5/15/14	ND	ND	ND	ND	ND	ND
EXC-10	J1TPN0	5/15/14	ND	ND	ND	ND	ND	ND
EXC-11	J1TPN1	5/15/14	ND	ND	ND	ND	ND	ND
EXC-12	J1TPN2	5/15/14	ND	ND	ND	ND	ND	ND
Split of J1TPL4	J1TPN5	5/15/14	ND	ND	ND	ND	ND	ND
FS-2	J1TPP7	5/15/14	ND	ND	ND	ND	ND	ND
Duplicate of J1TPN7	J1TPR4	5/15/14	ND	ND	ND	ND	ND	ND
FS-1	J1TPP6	5/15/14	ND	ND	ND	ND	ND	ND
FS-3	J1TPP8	5/15/14	ND	ND	ND	ND	ND	ND
FS-4	J1TPP9	5/15/14	ND	ND	ND	ND	ND	ND
FS-5	J1TPR0	5/15/14	ND	ND	ND	ND	ND	ND
FS-6	J1TPR1	5/15/14	ND	ND	ND	ND	ND	ND
FS-7	J1TPR2	5/15/14	ND	ND	ND	ND	ND	ND
FS-8	J1TPR3	5/15/14	ND	ND	ND	ND	ND	ND
FS-9	J1TPR5	5/15/14	ND	ND	ND	ND	ND	ND
FS-10	J1TPR6	5/15/14	ND	ND	ND	ND	ND	ND
FS-11	J1TPR7	5/15/14	ND	ND	ND	ND	ND	ND
FS-12	J1TPR8	5/15/14	ND	ND	ND	ND	ND	ND
FS-13	J1TPR9	5/15/14	ND	ND	ND	ND	ND	ND
FS-14	J1TPT0	5/15/14	ND	ND	ND	ND	ND	ND
FS-15	J1TPT1	5/15/14	ND	ND	ND	ND	ND	ND
FS-16	J1TPT2	5/15/14	ND	ND	ND	ND	ND	ND
Split of J1TPN7	J1TPT4	5/15/14	ND	ND	ND	ND	ND	ND
Equipment Blank	J1TPP5	5/15/14	ND	ND	ND	ND	ND	ND

[a] the required detection limit for asbestos is 1%.

Attachment	1	Sheet	12 of 12
Originator	J. D. Skoglie	Date	6/10/14
Checked	I. B. Berezovskiy	Date	6/10/14
Calc. No.	0100N-CA-V0273	Rev. No.	0

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CALCULATION COVER SHEET

Project Title: 100-N Field Remediation **Job No. 14655**

Area: 100-N

Discipline: Environmental *Calculation No: 0100N-CA-V0274

Subject: 100-N-93 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations

Computer Program: Excel Program No: Excel 2010

The attached calculations have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Summary = 3 Total = 4	J. D. Skoglie	I. B. Berezovskiy	H. M. Sulloway	D. F. Obenauer	6/16/14

SUMMARY OF REVISION

WCH-DE-018 (05/08/2007) *Obtain Calc. No. from Document Control and Form from Intranet

Washington Closure Hanford CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	6/10/2014	Calc. No.:	0100N-CA-V0274	Rev.:	0
Project:	100-N Field Remediation	Job No:	14655	Checked:	I. B. Berezovskiy	Date:	6/10/2014
Subject:	100-N-93 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 1 of 3	

PURPOSE:

Provide documentation to support the calculation of the direct contact hazard quotient (HQ) and excess carcinogenic risk for the 100-N-93 waste site. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2013), the following criteria must be met:

1) An HQ of <1.0 for all individual noncarcinogens
2) A cumulative HQ of <1.0 for noncarcinogens
3) An excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens
4) A cumulative excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.

GIVEN/REFERENCES:

1) DOE-RL, 2006, *100-N Area Sampling and Analysis Plan for CERCLA Waste Sites*, DOE/RL-2005-92, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

2) DOE-RL, 2013, *Remedial Design Report/Remedial Action Work Plan for the 100-N Area*, DOE/RL-2005-93, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

3) WAC 173-340, "Model Toxics Control Act – Cleanup," *Washington Administrative Code*, 1996.

4) WCH, 2014, *100-N-93 Waste Site Cleanup Verification 95% UCL Calculations,* 0100N-CA-V0273, Washington Closure Hanford, Richland, Washington.

SOLUTION:

1) Generate an HQ for each noncarcinogenic constituent detected above background or required detection limit/practical quantitation limit and compare it to the individual HQ of <1.0 (DOE-RL 2013).

2) Sum the HQs and compare this value to the cumulative HQ of <1.0.

3) Generate an excess cancer risk value for each carcinogenic constituent detected above background or required detection limit/practical quantitation limit and compare it to the excess cancer risk of $<1 \times 10^{-6}$ (DOE-RL 2013).

4) Sum the excess cancer risk value(s) and compare it to the cumulative cancer risk of $<1 \times 10^{-5}$.

Washington Closure Hanford CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	6/10/2014	Calc. No.:	0100N-CA-V0274	Rev.:	0
Project:	100-N Field Remediation	Job No:	14655	Checked:	I. B. Berezovskiy	Date:	6/10/2014
Subject:	100-N-93 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 2 of 3	

METHODOLOGY:

The 100-N-93 waste site is comprised of one decision unit for verification sampling consisting of the excavation area. In addition, eight focused samples were collected. The direct contact hazard quotient and carcinogenic risk calculations for the 100-N-93 waste site were conservatively calculated for the entire subsite using the greater of the maximum or statistical verification soil sample results (WCH 2014). Of the contaminants of potential concern (COPCs) for this waste site, molybdenum, the detected semivolatile organic compounds, and the detected polycyclic aromatic hydrocarbons require HQ and risk calculations because these analytes were detected and a Washington State or Hanford Site background value is not available. All other site nonradionuclide COPCs were not detected or were quantified below background levels. An example of the HQ and risk calculations is presented below:

1) For example, the maximum value for molybdenum is 0.88 mg/kg, divided by the noncarcinogenic RAG value of 400 mg/kg (calculated in accordance with the noncarcinogenic toxics effects formula in WAC 173-340-740[3]), is 2.2×10^{-3}. Comparing this value, and all other individual values, to the requirement of <1.0, this criterion is met.

2) After the HQ calculation is completed for the appropriate analytes, the cumulative HQ can be obtained by summing the individual values. To avoid errors due to intermediate rounding, the individual HQ values prior to rounding are used for this calculation. The sum of the HQ values is 2.2×10^{-3}. Comparing this value to the requirement of <1.0, this criterion is met.

3) To calculate the excess cancer risk, the maximum or statistical value is divided by the carcinogenic RAG value, then multiplied by 1.0×10^{-6}. For example, the maximum value for benzo(a)pyrene is 0.021 mg/kg, divided by 0.137 mg/kg, and multiplied as indicated, is 1.5×10^{-7}. Comparing this value, and all other individual values, to the requirement of $<1 \times 10^{-6}$, this criterion is met.

4) After these calculations are completed for the carcinogenic analytes, the cumulative excess cancer risk can be obtained by summing the individual values. To avoid errors due to intermediate rounding, the individual cancer risk values prior to rounding are used for this calculation. The sum of the excess cancer risk values is 1.7×10^{-7}. Comparing this value to the requirement of $<1 \times 10^{-5}$, this criterion is met.

RESULTS:

1) List individual noncarcinogens and corresponding HQs >1.0: None
2) List the cumulative noncarcinogenic HQ >1.0: None
3) List individual carcinogens and corresponding excess cancer risk $>1 \times 10^{-6}$: None

List the cumulative excess cancer risk for carcinogens $>1 \times 10^{-5}$: None

Table 1 shows the results of the hazard quotient and excess cancer risk calculations.

Washington Closure Hanford CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	6/11/2014	Calc. No.:	0100N-CA-V0274	Rev.:	0
Project:	100-N Field Remediation	Job No:	14655	Checked:	I. B. Berezovskiy	Date:	6/11/2014
Subject:	100-N-93 Waste Site Direct Contact Hazard Quotient and Carcinogenic Risk Calculations					Sheet No.	3 of 3

Table 1. Direct Contact Hazard Quotient and Excess Cancer Risk Results for the 100-N-93 Waste Site.

Contaminants of Potential Concern	Maximum or Statistical Value [a] (mg/kg)	Noncarcinogen RAG [b] (mg/kg)	Hazard Quotient	Carcinogen RAG [b] (mg/kg)	Carcinogen Risk
Metals					
Molybdenum	0.88	400	2.2E-03	--	--
Semivolatiles					
Benzo(a)anthracene	0.029	--	--	1.37	2.1E-08
Benzo(a)pyrene	0.021	--	--	0.137	1.5E-07
Dimethylphthalate	0.035	80,000	4.4E-07	--	--
Phenanthrene [c]	0.038	24,000	1.6E-06	--	--
Polycyclic Aromatic Hydrocarbons					
Chrysene	0.011	--	--	137	8.0E-11
Fluoranthene	0.017	3,200	5.3E-06	--	--
Pyrene	0.020	2,400	8.3E-06	--	--
Totals					
Cumulative Hazard Quotient:			**2.2E-03**		
Cumulative Excess Cancer Risk:					**1.7E-07**

Notes:

[a] = From WCH (2014). Method 8310 (PAH) results were used in place of Method 8270 (SVOA) when similar analytes were detected.

[b] = Value obtained from the 100-N Area RDR/RAWP (DOE-RL 2013) or *Washington Administrative Code* (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.

[c] = Toxicity data for this chemical is not available. The cleanup levels are based on use of surrogate chemicals.

phenanthrene surrogate: anthracene

-- = not applicable

RAG = remedial action goal

CONCLUSION:

The calculations in Table 1 demonstrate that the 100-N-93 waste site meets the requirements for the direct contact hazard quotient and carcinogenic (excess cancer) risk, respectively, as identified in the RDR/RAWP (DOE-RL 2013) and SAP (DOE-RL 2006). The direct contact hazard quotient and carcinogenic (excess cancer) risk calculations are for use in the RSVP for this waste site.

Acrobat 8.0

CALCULATION COVER SHEET

Project Title: 100-N Field Remediation **Job No. 14655**

Area: 100-N

Discipline: Environmental *Calculation No: 0100N-CA-V0275

Subject: 100-N-93 Waste Site Hazard Quotient and Carcinogenic Risk Calculation for Protection of Groundwater

Computer Program: Excel Program No: Excel 2010

The attached calculations have been generated to document compliance with established cleanup levels. These calculations should be used in conjunction with other relevant documents in the administrative record.

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Sheets = 3 Total = 4	J. D. Skoglie	I. B. Berezovskiy	H. M. Sulloway	D. F. Obenauer	6/16/14

SUMMARY OF REVISION

WCH-DE-018 (05/08/2007)	*Obtain Calc. No. from Document Control and Form from Intranet

Washington Closure Hanford CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	06/11/14	Calc. No.:	0100N-CA-V0275	Rev.:	0
Project:	100-N Field Remediation	Job No:	14655	Checked:	I. B. Berezovskiy	Date:	06/11/14
Subject:	100-N-93 Waste Site Hazard Quotient and Carcinogenic Risk Calculation for Protection of Groundwater					Sheet No.	1 of 3

PURPOSE:

Provide documentation to support the calculation of the hazard quotient (HQ) and excess carcinogenic risk associated with soil contaminant levels compared to soil cleanup levels for protection of groundwater for the 100-N-93 waste site. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) for the 100-N Area (DOE-RL 2013), the following criteria must be met:

1) An HQ of <1.0 for all individual noncarcinogens
2) A cumulative HQ of <1.0 for noncarcinogens
3) An excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens
4) A cumulative excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.

GIVEN/REFERENCES:

1) DOE-RL, 2013, *Remedial Design Report/Remedial Action Work Plan for the 100-N Area,* DOE/RL-2005-93, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

2) WAC 173-340, "Model Toxics Control Act – Cleanup," *Washington Administrative Code*, 1996.

3) WCH, 2014, *100-N-93 Waste Site Cleanup Verification 95% UCL Calculations,* 0100N-CA-V0273, Washington Closure Hanford, Richland, Washington.

SOLUTION:

1) Generate a HQ for each noncarcinogenic constituent detected above background in soil and with a K_d less than that required to show no migration to groundwater in 1,000 years using the RESRAD generic site model (DOE-RL 2013).

2) Sum the HQs and compare this value to the cumulative HQ of <1.0.

3) Generate an excess cancer risk value for each carcinogenic constituent detected above background in soil and with a K_d less than that required to show no migration to groundwater in 1,000 years using the RESRAD generic site model (DOE-RL 2013).

4) Sum the excess cancer risk value(s) and compare it to the cumulative cancer risk of $<1 \times 10^{-5}$.

Washington Closure Hanford CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	06/12/14	Calc. No.:	0100N-CA-V0275	Rev.:	0
Project:	100-N Field Remediation	Job No:	14655	Checked:	I. B. Berezovskiy	Date:	06/12/14
Subject:	100-N-93 Waste Site Hazard Quotient and Carcinogenic Risk Calculation for Protection of Groundwater					Sheet No. 2 of 3	

METHODOLOGY:

The 100-N-93 waste site is comprised of one decision unit for verification sampling, consisting of the excavation area. In addition, eight focused samples were collected. The protection of groundwater hazard quotient and carcinogenic risk calculations for the 100-N-93 waste site were conservatively calculated for the entire site using the statistical or maximum value for each analyte (WCH 2014). Based on the generic site RESRAD model (DOE-RL 2013) and a vadose zone of approximately 9.0 m (29.5 ft) thickness, a K_d of 7.9 or greater is required to show no predicted migration to groundwater in 1,000 years. Of the contaminants of potential concern (COPC) for this site, dimethyl phthalate is included because no Washington State or Hanford background value has been established and the distribution coefficient is less than that necessary to show no migration to groundwater in 1,000 years. All other site nonradionuclide COPCs were undetected, quantified below background levels, or have a K_d greater than or equal to 7.9. An example of the HQ and risk calculations for soil constituents with a potential impact to groundwater is presented below:

1) The hazard quotient is defined as the ratio of the dose of a substance obtained over a specified time (mg/kg/day) to a reference dose for the same substance derived over the same specified time (mg/kg/day). The hazard quotient can also be calculated as the ratio of the concentration in soil (maximum or statistical value) (mg/kg) to the soil RAG (mg/kg) for protection of groundwater, where the RAG is the groundwater cleanup level (µg/L) (calculated with, and related to the hazard quotient through, WAC 173-340-720 (3)(a)(ii)(A), (1996) x 100 x 1 mg/1000 µg (conversion factor). This is based on the "100 times rule" of WAC 173-340-740(3)(a)(ii) (A) (1996). For example, the maximum value for dimethyl phthalate of 0.035 mg/kg, divided by the noncarcinogenic RAG value of 1,600 mg/kg is 2.2×10^{-5}. Comparing this value to the requirement of <1.0, this criterion is met.

2) After the HQ calculation is completed for the appropriate analytes, the cumulative HQ can be obtained by summing the individual values. (To avoid errors due to intermediate rounding, the individual HQ values prior to rounding are used for this calculation.) The cumulative HQ for the 100-N-93 waste site is 2.2×10^{-5}. Comparing this value to the requirement of <1.0, this criterion is met.

3) To calculate the excess cancer risk, the maximum or statistical value is divided by the carcinogenic RAG value, and then multiplied by 1×10^{-6}. There were not any constituents in this calculation that had a carcinogenic RAG associated with it. Therefore, the requirement of $<1 \times 10^{-6}$ is met. Furthermore, the criterion for cumulative excess cancer risk for carcinogens is also met.

4) The soil cleanup RAGs for protection of groundwater are based on the "100 times" provision in WAC 173-340-740(3)(a)(ii)(A). WAC 173-340-740(3)(a)(ii)(A) (1996) provides the "100 times rule" but also states "unless it can be demonstrated that a higher soil concentration is protective of ground water at the site." When the "100 times rule" values are exceeded, RESRAD was used to demonstrate that higher soil concentrations may be protective of groundwater.

Washington Closure Hanford CALCULATION SHEET

Originator:	J. D. Skoglie	Date:	06/12/14	Calc. No.:	0100N-CA-V0275	Rev.:	0
Project:	100-N Field Remediation	Job No:	14655	Checked:	I. B. Berezovskiy	Date:	06/12/14
Subject:	100-N-93 Waste Site Hazard Quotient and Carcinogenic Risk Calculation for Protection of Groundwater					Sheet No.	3 of 3

RESULTS:

1) List individual noncarcinogens and corresponding HQs >1.0: None
2) List the cumulative noncarcinogenic HQ >1.0: None
3) List individual carcinogens and corresponding excess cancer risk >1 x 10^{-6}: None
4) List the cumulative excess cancer risk for carcinogens >1 x 10^{-5}: None.

Table 1 shows the results of the calculations.

Table 1. Hazard Quotient and Excess Cancer Risk Results for the 100-N-93 Waste Site.

Contaminants of Potential Concern	Maximum or Statistical Value[a] (mg/kg)	Noncarcinogen RAG[b] (mg/kg)	Hazard Quotient	Carcinogen RAG[b] (mg/kg)	Carcinogen Risk
Semivolatiles					
Dimethylphthalate	0.035	1,600	2.2E-05	--	--
Totals					
Cumulative Hazard Quotient:			**2.2E-05**		
Cumulative Excess Cancer Risk:					**0.0E+00**

Notes:
[a] = From WCH (2014).
[b] = Value obtained from the Cleanup Levels and Risk Calculations (CLARC) database using Groundwater, Method B, results and the 100 times model.
-- = not applicable
RAG = remedial action goal

CONCLUSION:

This calculation demonstrates that the 100-N-93 waste site meets the requirements for the hazard quotient and excess carcinogenic risk for protection of groundwater as identified in the RDR/RAWP (DOE-RL 2013).

APPENDIX D

DATA QUALITY ASSESSMENT

APPENDIX D

DATA QUALITY ASSESSMENT

VERIFICATION SAMPLING

A data quality assessment (DQA) was performed to compare the verification sampling approach and resulting analytical data with the sampling and data requirements specified in the site-specific sample design (WCH 2014b). This DQA was performed in accordance with site-specific data quality objectives found in the *100-N Area Sampling and Analysis Plan for CERCLA Waste Sites* (100-N Area SAP) (DOE-RL 2006).

A review of the sample design (WCH 2014b), the field logbook (WCH 2014a), and applicable analytical data packages has been performed as part of this DQA. All samples were collected and analyzed per the sample design. To ensure quality data, the SAP data assurance requirements and the data validation procedure for chemical analysis (BHI 2000) is used as appropriate. This review involves evaluation of the data to determine if they are of the right type, quality, and quantity to support the intended use (i.e., closeout decisions). The DQA completes the data life cycle (i.e., planning, implementation, and assessment) that was initiated by the data quality objectives process (EPA 2006).

Verification data from samples collected at the 100-N-93 waste site were provided by the laboratories in seven sample delivery groups (SDGs): SDG D1413749, SDG D1413750, SDG JP0797, SDG JP0798, SDG MA08697, SDG MA08698, SDG XP0090, and SDG XP0091. SDG JP0798 was submitted for third-party validation. No major deficiencies were identified in the analytical data set. Minor deficiencies are discussed for the 100-N-93 data set, as follows below. If no comments are made about a specific analysis, it should be assumed that no deficiencies affecting the quality of the data were found.

MINOR DEFICIENCIES

SDG D1413749

This SDG comprises one focused soil sample (J1TPT4) collected from the 100-N-93 excavation. This sample was analyzed for asbestos. No major or minor deficiencies were noted in the dataset. Asbestos was not detected. The data are usable for decision-making purposes.

SDG D1413750

This SDG comprises one focused soil sample (J1TPN5) collected from the 100-N-93 excavation. This sample was analyzed for asbestos. No major or minor deficiencies were noted in the dataset. Asbestos was not detected. The data are usable for decision-making purposes.

SDG JP0797

This SDG comprises nine focused soil samples (J1TPN4, J1TPN6 through J1TPN9, J1TPP0 through J1TPP5). This SDG includes a field duplicate pair (J1TPP6, J1TPP4). A field split (J1TPT3) associated with the field duplicate pair is included in SDG XP0090. Additionally, an equipment blank (J1TPP5) is included in this SDG. The equipment blank was analyzed for inductively coupled plasma (ICP) metals and mercury. The balance of the samples in this SDG were analyzed for ICP metals, mercury, polychlorinated biphenyls (PCBs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), and polycyclic aromatic hydrocarbons (PAH).

In the ICP metals analysis, the laboratory duplicate analysis of sample J1TPN6 returned silicon data that exhibited a relative percent difference (RPD) above the QC limits. The laboratory has qualified the associated sample result with an "M" flag. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, serial dilution of a digestate indicated chemical or physical interference for 11 elements (aluminum, barium, calcium, chromium, cobalt, iron, magnesium, manganese, nickel, vanadium, and zinc). The laboratory has qualified the associated data with "X" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

SDG JP0798

This SDG comprises 13 focused soil samples (J1TPK8, J1TPK9, J1TPL0 through J1TPL9, J1TPM0) collected from the 100-N-93 excavation. This SDG includes one field duplicate pair (J1TPL4/J1TPM0). These samples were analyzed for ICP metals, mercury, PCBs, SVOCs, TPH, and PAH. SDG JP0798 was submitted for third-party validation. Minor deficiencies are as follows:

In the SVOC analysis, the matrix spike (MSD) and matrix spike duplicate (MSD) recoveries for 2,4-dinitrophenol (36%, 40%) are outside the quality control (QC) limits. Third-party validation qualified all 2,4-dinitrophenol results in SDG JP0798 as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the MS recoveries for antimony (63%) and silicon (31%) are outside the QC limits. Third-party validation qualified all antimony and silicon results in SDG JP0798 as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the laboratory control sample (LCS) recovery for silicon (18%) is outside the QC limits. Third-party validation qualified all silicon results in SDG JP0798 as estimated with "J" flags. Estimated data are usable for decision-making purposes.

SDG MA08697

This SDG comprises 17 focused soil samples (J1TPP6 through J1TPP9, J1TPR0 through J1TPR9, J1TPT0 through J1TPT2) collected from the 100-N-93 excavation. These samples were analyzed for asbestos. No major or minor deficiencies were noted in the dataset. Asbestos was not detected. These data are usable for decision-making purposes.

SDG MA08698

This SDG comprises 13 focused soil samples (J1TPM1 through J1TPM9, J1TPN0 through J1TPR3) collected from the 100-N-93 excavation. These samples were analyzed for asbestos. No major or minor deficiencies were noted in the dataset. Asbestos was not detected. These data are usable for decision-making purposes.

SDG XP0090

This SDG comprises one focused soil sample (J1TPT3) that is the field split associated with the field duplicate pair (J1TPN7/J1TPP4) reported in SDG JP0797 above. This sample was collected from the 100-N-93 excavation. This sample was analyzed for ICP metals, mercury, PCBs, SVOCs, TPH, and PAH. Minor deficiencies are as follows:

In the SVOC analysis, the MS and MSD recoveries for acenaphthene (91%) are just above the laboratories acceptance range (49% to 90%). The laboratory conjectured that these slightly high recoveries may be due to the vagaries of the extraction process. The laboratory has qualified the associated data with "T" flags. These recoveries are within the projects QC range. These data are usable for decision-making purposes.

In the PCB analysis, one of five standards did not meet the laboratory QC limits for aroclor-1016; however, the average of the five peaks does meet the laboratories alternate QC standard. The aroclor-1016 data are usable for decision-making purposes.

In the PCB analysis, sample J1TPT3 and the MS and MSD made from this sample did not meet the laboratories surrogate recovery criteria; however, the target analyte recoveries in the MS and MSD were within QC limits. The laboratory determined this deficiency is due to matrix interference. Data for sample J1TPT3 and the MS and MSD may be considered estimated. Estimated data are usable for decision-making purposes.

SDG XP0091

This SDG comprises one focused soil sample (J1TPN4) that is the field split associated with the field duplicate pair (J1TPL4/J1TPM0) reported in SDG JP0798 above. This sample was collected from the 100-N-93 excavation. This sample was analyzed for ICP metals, mercury, PCBs, SVOCs, TPH, and PAH. Minor deficiencies are as follows:

In the SVOC analysis, the RPDs calculated for 2,4-dinitrophenol (53.5%), 2-methyl-4,6-dinitrophenol (33.3%), and hexachlorocyclopentadiene (44.6%) between the MS

and the MSD did not meet the acceptance criteria. However, the individual analyte recoveries were within the QC limits for both the MS and MSD. The laboratory determined there was no impact on the field sample data. The data are usable for decision making purposes.

In the SVOC analysis, the MS recovery for acenaphthene (91%) is just above the laboratories acceptance range (49% to 90%). The laboratory conjectured that this slightly high recovery may be due to the vagaries of the extraction process. The laboratory has qualified the associated data with "T" flags. These recoveries are within the projects QC range. These data are usable for decision-making purposes.

In the ICP metals analysis, MS recoveries for potassium (74.1%) and silicon (27.6%) did not meet QC limits. These deficiencies also resulted in an RPD in the laboratory duplicate for silicon (88.0 %) to exceed the QC limits. Post-digestions spikes for potassium (123%) and silicon (388%) were prepared and analyzed and also did not meet QC limits. The laboratory determined that these deficiencies were due to matrix interference. Neither potassium nor silicon is a regulated compound, and deficiencies in these data will not impact the evaluation of the 100-N-93 waste site. Data for potassium and silicon in SDG XP0091 may be considered estimated. Estimated data are usable for decision-making purposes.

FIELD QUALITY ASSURANCE/QUALITY CONTROL

Relative percent difference evaluations of main sample(s) versus the laboratory duplicate(s) are routinely performed and reported by the laboratory. Any deficiencies in those calculations are reported by SDG in the previous sections.

Field quality assurance (QA)/QC measures are used to assess potential sources of error and cross contamination of samples that could bias results. Field QA/QC samples, listed in the field logbook (WCH 2014a), are shown in Table D-1. The main and QA/QC sample results are presented in Appendix C.

Table D-1. Field Quality Assurance/Quality Control Samples.

Sample Area	Main Sample	Duplicate Sample	Split Sample
100-N-93 Excavation statistical samples – chemical analysis	J1TPL4	J1TPM0	J1TPN4
100-N-93 Excavation statistical samples – asbestos analysis	J1TPM7	J1TPN3	J1TPN5
100-N-93 Excavation focused samples – chemical analysis	J1TPN7	J1TPP4	J1TPT3
100-N-93 Excavation focused samples – asbestos analysis	J1TPP7	J1TPR4	J1TPT4

Field duplicate samples are collected to provide a relative measure of the degree of local heterogeneity in the sampling medium, unlike laboratory duplicates that are used to evaluate precision in the analytical process. The field duplicates are evaluated by computing the RPD of

the sample/duplicate pair(s) for each contaminant of potential concern (COPC). Relative percent differences are not calculated for analytes that are not detected in both the main and duplicate sample at more than five times the target detection limit (TDL). Relative percent differences of analytes detected at low concentrations (less than five times the detection limit) are not considered to be indicative of the analytical system performance. The calculation brief in Appendix C provides details on duplicate pair evaluation and RPD calculation.

Field split samples are used to determine systematic differences (bias) between laboratories. A statistical determination of systematic differences would require larger data sets than are presented here. Such a determination is complicated by variability introduced by the natural heterogeneities inherent in field soil samples, and the analytical variability that each individual laboratory experiences. Therefore, when evaluating limited field split data, relatively large RPDs are expected.

No major deficiencies in the RPD calculations were found for the duplicate or split samples. Minor deficiencies for the field duplicate and split samples are as follows:

In the field duplicate sample evaluation (Appendix C), the RPD calculated for silicon (35.3%) is above the QC range (less than 30%). Additionally, the field split RPD calculated for silicon (120.1%) is also above the QC range. Elevated RPDs in environmental samples are generally attributed to natural heterogeneity in the sample matrix. The laboratory attributed deficiencies in their evaluation of silicon RPDs to matrix interference. Silicon is not a regulated compound. The data are usable for decision-making purposes.

A secondary check of the data variability is used when one or both of the samples being evaluated (main and split) is less than five times the TDL, including undetected analytes. In these cases, a control limit of ±2 times the TDL is used (Appendix C) to indicate that a visual check of the data is required by the reviewer. None of the analytes required this check. A visual inspection of all of the data is also performed. No additional major or minor deficiencies are noted. The data are usable for decision-making purposes.

SUMMARY

Limited, random, or sample matrix-specific influenced batch QC issues such as those discussed above are a potential for any analysis. The number and types seen in these data sets are within expectations for the matrix types and analyses performed. The DQA review of the 100-N-93 waste site verification sampling data found that the analytical results are accurate within the standard errors associated with the analytical methods, sampling, and sample handling. The DQA review for the 100-N-93 waste site data set concludes that the reviewed data are of the right type, quality, and quantity to support the intended use. The analytical data were found acceptable for decision-making purposes.

The verification sample analytical data are stored in the Washington Closure Hanford project-specific database prior to being submitted for inclusion in the Hanford Environmental

Information System database. The verification sample analytical data are also summarized in Appendix C.

REFERENCES

BHI, 2000, *Data Validation Procedure for Chemical Analysis*, BHI-01435, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.

DOE-RL, 2006, *100-N Area Sampling and Analysis Plan for CERCLA Waste Sites,* DOE/RL-2005-92, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

EPA, 2006, *Guidance on Systematic Planning using the Data Quality Objectives Process*, EPA QA/G-4, U.S. Environmental Protection Agency, Office of Environmental Information, Washington, D.C.

WCH, 2014a, *100-N Field Remediation and Sampling*, Logbook EL-1652-12, pp. 2-8, Washington Closure Hanford, Richland, Washington.

WCH, 2014b, *Work Instruction for Verification Sampling of the 100-N-93, 100-N Stain Area #2,* Work Instruction No. 0100N-WI-G0091, Rev. 0, Washington Closure Hanford, Richland, Washington.