# WASTE SITE RECLASSIFICATION FORM

**Operable Unit:** 100-HR-1 **Control No.:** 2015-052

**Waste Site Code(s)/Subsite Code(s):** 100-H-42

**Reclassification Category:** Interim ☒ Final ☐

**Reclassification Status:** Closed Out ☒ No Action ☐ Rejected ☐
RCRA Postclosure ☐ Consolidated ☐ None ☐

**Approvals Needed:** DOE ☒ Ecology ☒ EPA ☐

**Description of current waste site condition:**

The 100-H-42, 1906-H Drainage Lift Station waste site, part of the 100-HR-1 Operable Unit, was added to the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units* (Remaining Sites 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 Area Remaining Sites Interim Remedial Action Record of Decision, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington (EPA 2009). Subsequently, the 100-H-42 waste site was recommended for remedial action without confirmatory sampling based on analogous sites information.

Remedial action at the 100-H-42 waste site began in October 2013 and was completed on March 3, 2014. The excavation extended to a maximum depth of approximately 9 m (29.5 ft) below ground surface, resulting in approximately 7,563 bank cubic meters (BCM) (9,892 bank cubic yards [BCY]) of contaminated soil and debris being removed and staged in a staging pile area prior to loadout and disposal at the Environmental Restoration Disposal Facility (ERDF). Approximately 10,891 BCM (14,245 BCY) of material was salvaged from the 100-H-42 waste site and stockpiled for use as clean backfill material. No anomalies were encountered during remediation. Waste loadout with disposal at ERDF was completed in April 2015.

Verification samples were collected from the 100-H-42 excavation on December 12, 2014, and from the staging pile area and overburden soil stockpiles on December 10, 2014, and February 26 and April 2, 2015. The sampling was performed to determine if the site decision units met the remedial action objectives and remedial action goals established by the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (100 Area RDR/RAWP), DOE/RL-97-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington (DOE-RL 2009b), and the Remaining Sites 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-H-42 waste site demonstrate that the site meets the remedial action objectives and corresponding remedial action goals established in the 100 Area RDR/RAWP (DOE-RL 2009b) and the Remaining Sites 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. Although the maximum depth of the excavation extended into the deep zone (i.e., greater than 4.6 [15 m] below ground surface), the waste sites were evaluated against the shallow zone criteria. Contamination above direct exposure levels was not observed in the verification soil samples collected from the excavations; 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-H-28:2 and 100-H-42 Waste Sites (attached).*

# WASTE SITE RECLASSIFICATION FORM

**Operable Unit:** 100-HR-1 **Control No.:** 2015-052

**Waste Site Code(s)/Subsite Code(s):** 100-H-42

**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 | J P Neath | 9/23/15 |
| DOE Federal Project Director (printed) | Signature | Date |
| N. Menard | Nina M. Menard | 9/25/15 |
| Ecology Project Manager (printed) | Signature | Date |
| NA | | |
| EPA Project Manager (printed) | Signature | Date |

# WASTE SITE RECLASSIFICATION FORM

**Operable Unit:** 100-HR-1 **Control No.:** 2015-053

**Waste Site Code(s)/Subsite Code(s):** 100-H-28:2

**Reclassification Category:** Interim ☒ Final ☐

**Reclassification Status:** Closed Out ☒ No Action ☐ Rejected ☐
RCRA Postclosure ☐ Consolidated ☐ None ☐

**Approvals Needed:** DOE ☒ Ecology ☒ EPA ☐

**Description of current waste site condition:**

The 100-H-28:2, South Process Sewers subsite is part of the 100-H-28, 100-H Water Treatment Facilities Underground Pipelines waste site. The 100-H-28 waste site, part of the 100-HR-1 Operable Unit, was added to the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units* (Remaining Sites 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 Area Remaining Sites Interim Remedial Action Record of Decision, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington (EPA 2009). Subsequently, the 100-H-28 waste site was divided into eight subsites and the 100-H-28:2, South Process Sewers subsite was recommended for remedial action due to the results of confirmatory sampling.

Remedial action at the 100-H-28:2 subsite was performed from September 2011 through March 2012, September 2013 through March 20, 2014, and September 2 through September 23, 2014. The excavation extended to a maximum depth of approximately 9 m (29.5 ft) below ground surface, resulting in approximately 40,677 bank cubic meters (BCM) (53,204 bank cubic yards [BCY]) of contaminated soil and debris being removed and staged in a staging pile area prior to loadout and disposal at the Environmental Restoration Disposal Facility (ERDF). Approximately 86,480 BCM (113,112 BCY) of material was salvaged from the 100-H-28:2 subsite and stockpiled for use as clean backfill material. A crushed drum containing residual oil was encountered in the layback of the 100-H-28:2 subsite excavation. No other anomalous materials were encountered. Waste loadout with disposal at ERDF was completed in April 2015.

Verification samples were collected from the 100-H-28:2 subsite excavation on December 15, 2014, and March 16, 2015, and from the staging pile area and overburden soil stockpiles on December 10, 2014, and February 26 and April 2, 2015. The sampling was performed to determine if the site decision units met the remedial action objectives and remedial action goals established by the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (100 Area RDR/RAWP), DOE/RL-97-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington (DOE-RL 2009b), and the Remaining Sites 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-H-28:2 subsite demonstrate that the site meets the remedial action objectives and corresponding remedial action goals established in the 100 Area RDR/RAWP (DOE-RL 2009b) and the Remaining Sites 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. Although the maximum depth of the excavation extended into the deep zone (i.e., greater than 4.6 [15 m] below ground surface), the waste sites were evaluated against the shallow zone criteria. Contamination above direct exposure levels was not observed in the verification soil samples collected from the excavations; 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-H-28:2 and 100-H-42 Waste Sites (attached).*

# WASTE SITE RECLASSIFICATION FORM

**Operable Unit:** 100-HR-1 **Control No.:** 2015-053

**Waste Site Code(s)/Subsite Code(s):** 100-H-28:2

**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 | J P Neath | 9/23/15 |
| DOE Federal Project Director (printed) | Signature | Date |
| N. Menard | Nina M. Menard | 9/25/15 |
| Ecology Project Manager (printed) | Signature | Date |
| NA | | |
| EPA Project Manager (printed) | Signature | Date |

# REMAINING SITES VERIFICATION PACKAGE FOR THE 100-H-28:2 AND 100-H-42 WASTE SITES

**Attachment to Waste Site Reclassification Forms 2015-052 and 2015-053**

**October 2015**

# REMAINING SITES VERIFICATION PACKAGE FOR THE 100-H-28:2 AND 100-H-42 WASTE SITES

## EXECUTIVE SUMMARY

The 100-H-28:2, South Process Sewers subsite consisted of vitrified clay, reinforced concrete, and cast iron process sewer lines formerly servicing the 105-H Reactor Building, 190-H Pumphouse, 183-H clearwells and pumphouse, and miscellaneous 1700 series buildings located east of the 190-H Pumphouse. These process sewer lines formerly drained to the 1906-H lift station, which pumped wastes to the 1904-H Outfall. The operational history of the 100-H-28:2 pipelines is linked to the operation of the 100-H Area reactor from 1949 to 1965.

The 100-H-42, 1906-H Drainage Lift Station was a reinforced concrete flume/reservoir designed to receive process sewer discharges from all of the nonradioactive buildings in the 100-H Area.

Remedial action at the 100-H-28:2 subsite was performed from September 2011 through March 2012; September 2013 through March 20, 2014; and September 2 through September 23, 2014. The excavation extended to a maximum depth of approximately 9 m (29.5 ft) below ground surface (bgs) resulting in approximately 21,650 bank cubic meters (BCM) (28,317 bank cubic yards [BCY]) of contaminated soil and debris being removed and staged in a staging pile area prior to loadout and disposal at the Environmental Restoration Disposal Facility (ERDF). Approximately 93,000 BCM (121,639 BCY) of material was salvaged from the 100-H-28:2 subsite and stockpiled for use as clean backfill material. A crushed drum containing residual oil was encountered in the layback of the 100-H-28:2 subsite excavation. No other anomalous materials were encountered. Waste loadout with disposal at ERDF was completed in April 2015.

Remedial action at the 100-H-42 waste site began in October 2013 and was completed on March 3, 2014. The excavation extended to a maximum depth of approximately 9.0 m (29.5 ft) bgs resulting in approximately 5,200 BCM (6,801 BCY) of contaminated soil and debris being removed and staged in a staging pile area prior to loadout and disposal at ERDF. Approximately 24,000 BCM (31,390 BCY) of material was salvaged from the 100-H-42 waste site and stockpiled for use as clean backfill material. No anomalies were encountered during remediation of the 100-H-42 waste site. Waste loadout with disposal at ERDF was completed in April 2015.

Verification samples were collected from the 100-H-28:2 and 100-H-42 excavations, associated overburden piles, and waste staging pile areas on December 18, 2013; February 26, 2014; December 10, 12, and 15, 2014; February 26, 2015; March 16, 2015; and April 2, 2015. The verification sampling results indicate that the waste removal action achieved compliance with the remedial action objectives and remedial action goals established in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (100 Area RDR/RAWP) (DOE-RL 2009b) and the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington* (Remaining Sites ROD) (EPA 1999).

A summary of the cleanup evaluation for the results from verification sampling compared to applicable criteria is presented in Table ES-1. The results of verification sampling are used to make reclassification decisions for the 100-H-28:2 subsite and the 100-H-42 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-H-28:2 and 100-H-42 Waste Sites. (2 Pages)**

| Regulatory Requirement | Remedial Action Goals | Results | Remedial Action Objectives Attained? |
|---|---|---|---|
| Direct Exposure – Radionuclides | Attain dose rate of <15 mrem/yr above background for 1,000 years. | The cumulative radionuclide activity for the 100-H-28:2 subsite and 100-H-42 waste site, based on a sum-of-fractions calculation (0.660 mrem/yr), is below the 15 mrem/yr dose limitation. | Yes |
| Direct Exposure – Nonradionuclides | Attain individual COPC direct exposure RAGs. | All individual COPC concentrations are below the direct exposure RAGs. | Yes |
| 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 ($2.4 \times 10^{-1}$) 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 ($9.0 \times 10^{-7}$) is $<1 \times 10^{-5}$. | |
| Groundwater/River Protection – Radionuclides | Attain single-COPC groundwater and river protection RAGs. | All radionuclide COPCs were below the groundwater and river protection RAGs. | Yes |
| | Attain national primary drinking water standards[a]: 4 mrem/yr (beta/gamma) dose rate to target receptor/organs. | | |
| | Meet drinking MCL for alpha emitters. | | |
| | Meet total uranium standard of 30 µg/L (21.2 pCi/L)[b]. | | |

**Table ES-1. Summary of Remedial Action Goals for the 100-H-28:2 and 100-H-42 Waste Sites. (2 Pages)**

| Regulatory Requirement | Remedial Action Goals | Results | Remedial Action Objectives Attained? |
|---|---|---|---|
| Groundwater/River Protection – Nonradionuclides | Attain individual nonradionuclide groundwater and river cleanup requirements. | Chromium (total), lead, mercury, aroclor-1254, aroclor-1260, 4-4'-DDE, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene exceeded soil RAGs for groundwater and river protection. However, based on RESRAD modeling discussed in Appendix C of the 100 Area RDR/RAWP (DOE-RL 2009b), it is predicted that the residual concentrations of these constituents will not reach groundwater (and thus the Columbia River) within 1,000 years [c]. | Yes |

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

[b] 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).

[c] Based on RESRAD modeling discussed in Appendix C of the 100 Area RDR/RAWP (DOE-RL 2009b), the residual concentrations of chromium (total), lead, mercury, aroclor-1254, aroclor-1260, 4-4'-DDE, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene are not predicted to migrate more than 1.8 m (5.9 ft) vertically within 1,000 years (based on the contaminants with the lowest $K_d$ values [lead and mercury with a $K_d$ of 30 mL/g]). The vadose zone underlying the 100-H-28:2 and 100-H-42 excavation is approximately 2.5 m (8.2 ft) thick. Therefore, the residual concentrations of chromium (total), lead, mercury, aroclor-1254, aroclor-1260, 4-4'-DDE, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene are predicted to be protective of groundwater and the Columbia River.

COPC = contaminant of potential concern
DDE = dichlorodiphenyldichloroethylene
DOE = U.S. Department of Energy
$K_d$ = distribution coefficient
MCL = maximum contaminant level
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 support a reclassification of the 100-H-28:2 subsite and the 100-H-42 waste site to Interim Closed Out. The current site conditions achieve the remedial action objectives and the corresponding remedial action goals of the 100 Area RDR/RAWP (DOE-RL 2009b) and the Remaining Sites ROD (EPA 1999). The results also demonstrate that residual contaminant concentrations support unrestricted future use of shallow zone soil (surface to 4.6 m [15 ft] bgs), and that contaminant levels remaining in the soil are protective of groundwater and the Columbia River. Although the maximum depth of the excavation extended into the deep zone (i.e., greater than 4.6 [15 m] bgs), the waste sites were evaluated against the shallow zone criteria. Contamination above direct exposure levels was not observed in the verification soil samples collected from the excavations; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone soil are not required.

Soil cleanup levels were established in the Remaining Sites ROD (EPA 1999) based in part on a limited ecological risk assessment. Although not required by the Remaining Sites ROD, a comparison against ecological risk screening levels has been made for the 100-H-28:2 subsite and the 100-H-42 waste site contaminants of potential concern and other constituents (Appendix A). Ecological screening levels from the *Washington Administrative Code* (WAC) 173-340, "Model Toxics Control Act – Cleanup," were exceeded for arsenic, boron, lead, mercury, and vanadium. The U.S. Environmental Protection Agency's ecological soil screening levels were exceeded for antimony, lead, manganese, vanadium, and zinc. Exceedance of screening values is intended to trigger additional evaluation and does not necessarily indicate the existence of risk to ecological receptors. Because concentrations of antimony, manganese, vanadium, and zinc are below Hanford Site or Washington State background values, it is believed that the presence of these constituents does 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 these sites.

# REMAINING SITES VERIFICATION PACKAGE FOR THE 100-H-28:2 AND 100-H-42 WASTE SITES

## STATEMENT OF PROTECTIVENESS

The 100-H-28:2 subsite and the 100-H-42 waste site verification sampling data, site evaluations, and supporting documentation demonstrate that these sites meet the objectives established in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (100 Area RDR/RAWP) (DOE-RL 2009b) and the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington* (Remaining Sites 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 results also demonstrate that residual contaminant concentrations support unrestricted future use of shallow zone soil (i.e., surface to 4.6 m [15 ft]), and that contaminant levels remaining in the soil are protective of groundwater and the Columbia River. Although the maximum depth of the excavation extended into the deep zone (i.e., greater than 4.6 [15 m] below ground surface [bgs]), the waste sites were evaluated against the shallow zone criteria. Contamination above direct exposure levels was not observed in the verification soil samples collected from the excavations; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone soil are not required.

Soil cleanup levels were established in the Remaining Sites ROD (EPA 1999) based in part on a limited ecological risk assessment. Although not required by the Remaining Sites ROD, a comparison against ecological risk screening levels has been made for the 100-H-28:2 subsite and the 100-H-42 waste site contaminants of potential concern (COPCs) and other constituents (Appendix A). Ecological screening levels from the *Washington Administrative Code* (WAC) 173-340, "Model Toxics Control Act – Cleanup," were exceeded for arsenic, boron, mercury, and vanadium. The U.S. Environmental Protection Agency's (EPA) ecological soil screening levels were exceeded for antimony, manganese, vanadium, and zinc. Exceedance of screening values is intended to trigger additional evaluation and does not necessarily indicate the existence of risk to ecological receptors. Because concentrations of antimony, manganese, vanadium, and zinc are below Hanford Site or Washington State background values, it is believed that the presence of these constituents does 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 these sites.

## GENERAL SITE INFORMATION AND BACKGROUND

### 100-H-28:2 Waste Site History

The 100-H-28:2, South Process Sewers subsite consisted of vitrified clay, reinforced concrete, and cast iron process sewer lines formerly servicing the 105-H Reactor Building, 190-H Pumphouse, 183-H clearwells and Pumphouse, and miscellaneous 1700 series buildings east of the 190-H Pumphouse. These process sewers formerly drained to the 1906-H lift station, which pumped wastes to the 1904-H outfall. The operational history of the 100-H-28:2 pipelines

is expected to coincide with that of the 105-H Reactor from 1949 to 1965. These pipelines were located around the former buildings in the southern portion of the 100-H Area (Figure 1).

The main pipelines for these sewers consisted of 1.07-m (42-in.) and 1.37-m (54-in.)-diameter reinforced concrete pipe (RCP) up to the confluence with the 100-H-28:3 north process sewers, from which a 1.83-m (72-in.)-diameter RCP line carried the combined flow to the 1906-H lift station. Waste flow from the process sewers was ultimately discharged to the Columbia River at the 1904-H outfall; however, past remediation of radioactive liquid waste effluent pipelines (BHI 2000) and demolition of the 1906-H lift station (WHC 1991) included removal of the downstream portion of the process sewers to a point slightly west of the 1906-H facility. The feeder lines formerly discharging to the 100-H-28:2 main pipelines consisted of small diameter (0.08- to 0.20-m [3- to 8-in.]) vitrified clay and cast iron pipe and larger diameter (up to 0.91-m [36-in.]) RCP.

The 183-H facility was used for the physical and chemical treatment of river water for use in reactor cooling and other 100-H Area operations. Chemical treatment included hydrogen ion concentration (pH) modification (with sulfuric acid), chlorination for algae control and the addition of coagulants (primarily alum prepared at the facility with bauxite and sulfuric acid), and a commercial organic polymer flocculation/filtration aid (DOE-RL 1992). In 1973, a portion of the former flocculation and settling basins were converted for use in volume reduction of chemical and mixed wastes from 300 Area fuel fabrication facilities. These basins (116-H-6 solar evaporation basins) were used until 1988 when the last of the sludge was removed (DOE-RL 1995).

The 190-H facility included additional clearwell storage and final pumping for cooling water supplied to the 105-H Reactor Building. Sodium dichromate was also added at the clearwell inlets as a reducing agent/corrosion inhibitor (DOE-RL 1992). The process sewer feeder lines at this facility received primarily underflow/overflow of drains from the clearwells and facility floor drains.

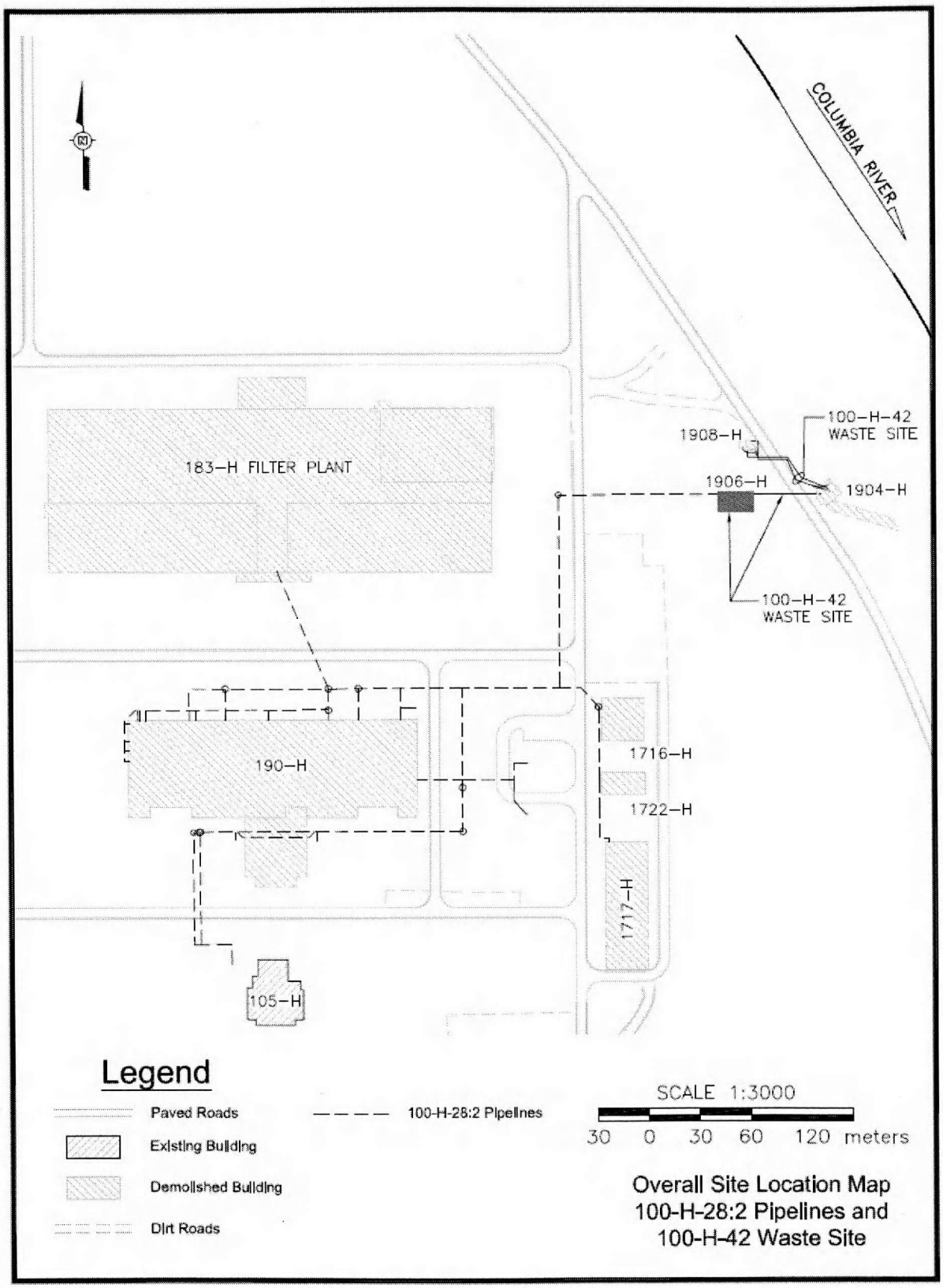
The 105-H Reactor Building housed the reactor and supporting operations. The historic use of the process sewer feeder line, formerly servicing this building, is presumed to have received drainage from floor drains on the "clean" side of the reactor due to the location of the pipeline.

The 1700 series buildings were primarily maintenance/support facilities for 100-H Area operations including a fueling station, first aid station, paint shop, and machine shop/fabrication shop/hot shop (100-H-4 waste site). Operations at the hot shop included work with low-level radioactive materials, and low-level contamination may have been flushed to the process sewer.

**100-H-42 Waste Site History**

The 100-H-42 waste site includes the 1906-H Drainage Lift Station, the 1908-H Effluent Monitoring Station, and associated pipelines connecting these facilities to the former 1904-H (116-H-5) Outfall Structure (Figure 1).

**Figure 1. The 100-H-28:2 and 100-H-42 Overall Site Location Map.**



The 1906-H process sewer/drainage lift station was designated and built to receive nonradioactive process sewer discharges (primarily floor drains) from buildings in the 100-H Area. Influent to the facility came through a 183-cm (72-in.)-diameter RCP (100-H-28:2 subsite) and was received in an underground reinforced concrete reservoir before being pumped to the 1904-H (116-H-5) Outfall Structure. Three pumps, switch gear, and controls were housed in a one-story concrete block building over a portion of the reservoir. Effluent from the underground reservoir was conveyed to the 1904-H Outfall Structure via the 183-cm (72-in.)-diameter RCP that was part of the 100-H-42 waste site.

The 100-H-42 waste site facilities operated from 1949 to 1965, the operational period of the H Reactor. In 1974, the above-grade portion of the 1906-H facility was demolished into the below-grade reservoir and the site was backfilled with clean soil (WHC 1991). The demolition report provides no information regarding contamination or possible hazardous material remaining in the structure at the time of demolition.

The 1908-H Effluent Monitoring Station was designed and built to provide a means of continuous monitoring and sampling of cooling water effluent that was being discharged to the river via the 1904-H Outfall Structure (116-H-5). The building had a 36,400-L (10,000-gal) open-topped monitoring tank. The tank was fed by a 15-cm (6 in.)-diameter line from pumps in the 1904-H Outfall Structure. The tank drained back to the outfall through a 20-cm (8-in.)-diameter line. The 100-H-42 site also includes these two pipelines. In 1974, the 1908-H Effluent Monitoring Station was demolished and all materials were sent to the 200 Area for burial (WHC 1991). No information is available on the status of the building foundation or potential residual contamination from operation of the facility.

Portions of the 100-H-42 waste site pipelines were removed during remediation of the 116-H-5, 1904-H Outfall Structure.

## CONFIRMATORY SAMPLING

### 100-H-28:2

Confirmatory sampling at the 100-H-28:2 subsite was conducted between May 2008 and December 2008 in accordance with the *Work Instruction for Confirmatory Sampling of the 100-H-28:2 South Process Sewer* (WCH 2006). The confirmatory sampling design was developed using a phased sampling approach.

Phase I consisted of the collection of representative samples of accessible sediments within manhole structures. Because the results of Phase I sampling did not support a determination that the entirety of the 100-H-28:2 pipelines required remediation, additional data was necessary and the Phase II sampling was initiated.

Phase II consisted of the excavation of test pits at manhole structures and junction boxes within each service area at locations likely to contain the highest levels of residual contamination from historic waste flows. Representative samples were taken from pipeline/manhole contents and

underlying soils potentially impacted by leakage in each service area as needed to expand the data set generated under Phase I.

**Confirmatory Sample Results**

The 100-H-28:2 subsite was divided into six service areas for confirmatory sampling. Sample results of pipe sediment collected from a shallow zone test pit in service area 1 exceeded direct exposure remedial action goals (RAGs) for carbon-14, cesium-137, lead, benzo(a)anthracene, and benzo(a)pyrene. The other service areas were located primarily in the deep zone. Sample results from a deep zone test pit in service area 1 exceeded groundwater and river protection RAGs for antimony, cadmium, chromium, copper, lead, mercury, nickel, zinc, polychlorinated biphenyls (PCBs), and some individual pesticides and semivolatile organic compounds (SVOCs).

The 100-H-28:2 pipelines extended into the deep zone to a depth such that contamination could migrate to groundwater and the river. Therefore, sections of the pipeline in service areas 5 and 6 and portions of service areas 2 and 3 that were located in the deep zone downstream from service area 1 were recommended for remediation. It was not practical to continue confirmatory sampling to support a potential no action decision for the remainder of the pipelines in the 100-H-28:2 subsite; therefore, the remediation recommendation was extended to include the entire 100-H-28:2 subsite.

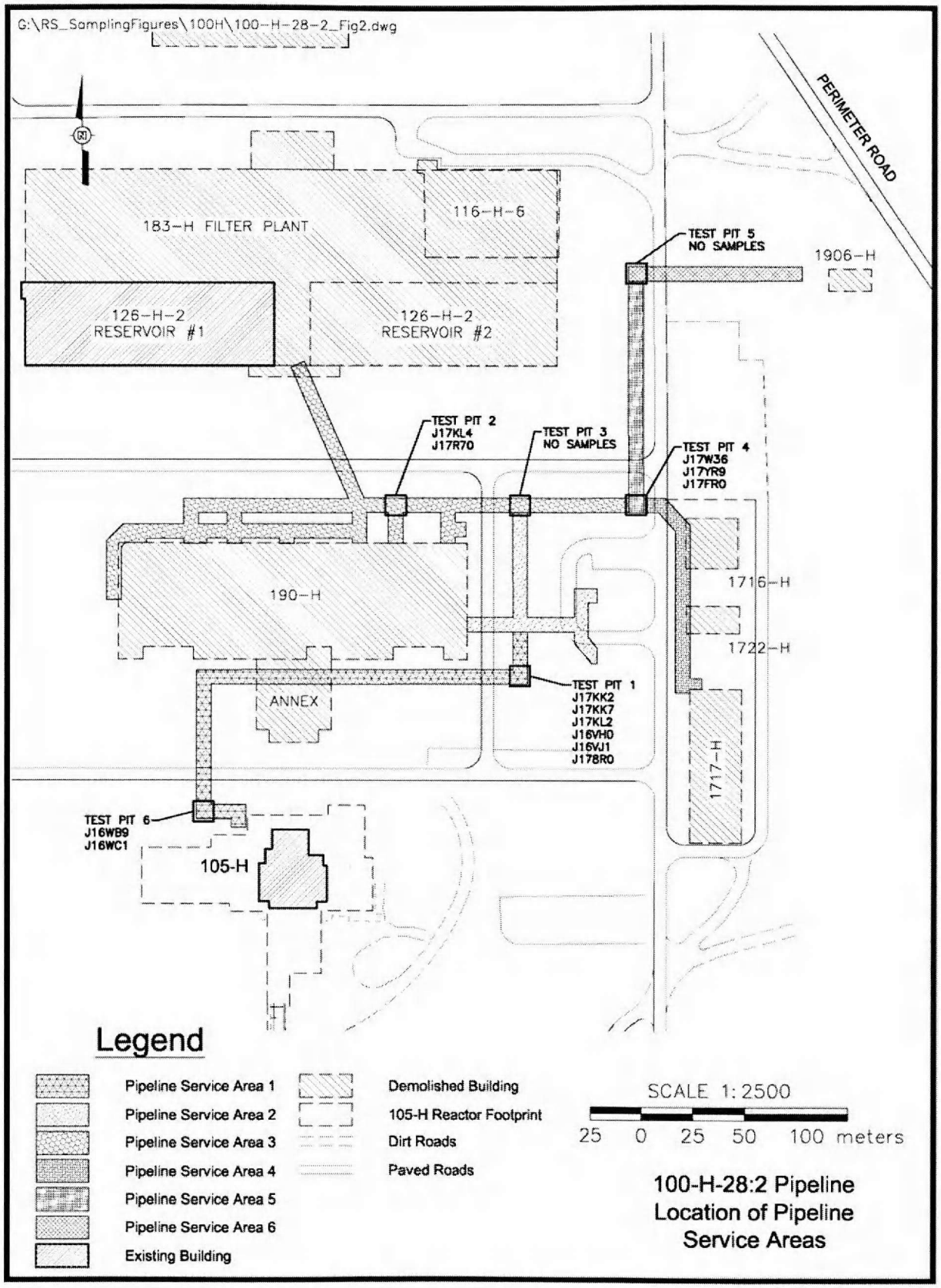
The contents of two french drains that were discovered during the confirmatory sampling activities were sampled and the results for each exceeded groundwater and river protection RAGs for lead. Therefore, the french drains and impacted soil, as evidenced from soil staining within and below the drain, were recommended for remediation as part of the 100-H-28:2 subsite. The french drains were located within the planned excavation layback.

A summary of the confirmatory samples collected and the resulting analytical data are provided in Appendix B, Tables B-1 and B-2, respectively. The confirmatory sample locations are shown in Figure 2.

**100-H-42**

The 100-H-42 waste site was composed of the liquid waste effluent system of the 100-H Area. Based on known operational processes, limited demolition information, and samples from other components of the liquid waste system, the 100-H-42 waste site was recommended for remediation without confirmatory sampling (WCH 2009).

**Figure 2. The 100-H-28:2 Subsite Confirmatory Sampling Location.**



## REMEDIAL ACTION SUMMARY

### 100-H-28:2

Remedial action at the 100-H-28:2 subsite was performed from September 2011 through March 2012; September 2013 through March 20, 2014; and September 2 through September 23, 2014. The 100-H-28:2 excavation extended to an approximate maximum depth of 9 m (29.5 ft) bgs. The waste material included 11- to 22-m (36- to 72-in.)-diameter concrete pipe, 1.8- to 2.4-m (6- to 8-in.)-diameter concrete-encased vitrified clay pipe, manhole debris, interfering structural debris, and former building demolition debris. The majority of the interfering structural and demolition debris was encountered along the east-west pipe section immediately south of the former 190-H Building (Figure 3). The structural and demolition debris included reinforced concrete, coal ash, steel pipe, asbestos transite, and other general building demolition debris. The asbestos transite debris was encountered at the ground surface prior to excavation of the 100-H-28:2 pipeline. The asbestos transite debris was removed and direct loaded for disposal at the Environmental Restoration Disposal Facility (ERDF). All removal and handling of asbestos transite debris was conducted and directed by asbestos-competent individuals. Following removal of asbestos debris, the area was inspected by an asbestos-competent person to verify that all visible asbestos debris had been removed.

**Figure 3. Photograph of the Structural Concrete from the 190-H Building, Looking North.**

During remediation of the south pipeline section of the 100-H-28:2 subsite, a french drain with red rocks was encountered. One in-process sample was collected before the area was further remediated. The resulting data are provided in Appendix B. A focused verification soil sample (FS-1) was also collected at this location. The results of the focused sample are included in Appendix C.

To maintain access necessary to support continued remediation efforts at the 100-H-28:2 subsite, land bridges were installed at locations where the 100-H-28:2 pipeline remediation removed established roadways. After the pipeline was remediated, focused verification soil samples were collected and the roadway was backfilled. The results of the focused samples are included in Appendix C.

Approximately 21,650 bank cubic meters (BCM) (28,317 bank cubic yards [BCY]) of contaminated soil and debris were removed from the 100-H-28:2 subsite and staged at the staging pile areas (SPAs) pending loadout and disposal. These SPAs also received waste from nine other waste sites including 100-H-46, 100-H-28:3, 100-H-28:4, 100-H-28:5, 100-H-42, 100-H-44, 100-H-48, 100-H-51:3, and 100-H-52. A total of eight SPAs were designated and used to stage waste from these waste sites. Following the load out of stockpile materials, the SPAs were scraped to 0.3 m (1 ft) bgs. The loadout and disposal of the waste material was completed in April 2015. No stained soil was observed.

Approximately 93,000 BCM (121,639 BCY) of overburden soil was salvaged from the 100-H-28:2 subsite excavation and stockpiled for use as clean backfill material. Some of the overburden material associated with the 100-H-28:2 subsite was included in the combined 100-H-28 overburden pile and was addressed in the 100-H-28:3, 100-H-28:5, and 100-H-44 Remaining Sites Verification Package. The remaining overburden material is addressed in this Remaining Sites Verification Package.

The 100-H-28:2 pipeline on the south side of the 183-H Building was excavated to the maximum extent. A segment of the 100-H-28:2 pipeline entering the 183-H Building concrete slab was left in place. The excavation of the remaining pipeline section could not proceed safely without demolition and excavation of the 183-H reinforced concrete slab. For verification purposes, one focused sample (FS-3) was collected from the pipeline contents.

During the removal of the 100-H-46 waste site and the associated layback/overburden material, the 100-H-28:2 pipelines were excavated and removed for disposal to ERDF. The 100-H-46 waste site excavation depth extends to groundwater. The 100-H-28:2 pipeline sections remediated within the 100-H-46 excavation are excluded from the 100-H-28:2 and 100-H-42 waste site verification sampling design.

During the excavation of the 100-H-28:2 subsite, and the removal of the interfering structure and debris south of the former 190-H Building, a crushed drum containing residual oil was encountered. The former contents of the drum impacted surrounding soil and debris and exhibited an odor. Samples collected from the soils impacted by the drum contents indicated elevated PCBs, SVOCs, and pesticides. The drum and impacted soils and debris were excavated and loaded for disposal at ERDF. In-process sampling results for this anomaly are included in Appendix B. Although the crushed drum was found in the layback of 100-H-28:2 excavation and is not associated with the process of the 100-H-28:2 pipeline, one focused sample (FS-2) will be collected from the former location of this crushed drum and analyzed for all 100-H-28:2 and 100-H-42 site COPCs.

**100-H-42**

Remediation at the 100-H-42 waste site began in October 2013 and was completed on March 3, 2014. The waste from this site included reinforced concrete, steel pipe, asphalt, soil, and miscellaneous demolition debris from the large subsurface structure associated with the 1906-H Drainage Lift Station. Approximately 5,200 BCM (6,801 BCY) of contaminated material was removed from the 100-H-42 excavation and staged at the SPA locations for disposal at ERDF. The 100-H-42 waste site was excavated to an approximate depth of 9 m (29.5 ft) bgs. A large concrete monolith remains at the bottom of the 100-H-42 excavation and likely protrudes to groundwater. The extensive use of concrete was not uncommon during construction of historical facilities and structures at the Hanford Site. The concrete monolith was inspected for staining; no staining was identified on the concrete surface. In accordance with the regulatory agreement (WCH 2014a), the concrete monolith will be left in place. A photograph of the monolith is provided in Figure 4.

**Figure 4. Concrete Monolith Left in Place in the 100-H-42 Excavation, Looking Northeast.**

Approximately 24,000 BCM (31,390 BCY) of overburden material was excavated from the 100-H-42 waste site and stockpiled at two designated areas. Overburden material removed from the 100-H-28:2, 100-H-28:3, 100-H-28:4, and 100-H-28:5 pipeline sites was also stockpiled at these two overburden stockpiles.

Several in-process soil samples were collected from the 100-H-28:2 subsite and 100-H-42 waste site. A summary of the in-process samples collected and the resulting analytical data are provided in Appendix B, Tables B-3 and B-4, respectively.

The post-excavation civil survey of the 100-H-28:2 subsite and the 100-H-42 waste site remediation areas is provided in Figures 5 through 7. The walkaround boundary surveys for the overburden soil stockpiles and the waste SPAs are provided in Figures 8 and 9, respectively.

## VERIFICATION SAMPLING ACTIVITIES

Verification samples from the 100-H-28:2 subsite, 100-H-42 waste site, and associated overburden soil stockpiles and waste SPAs were collected on November, 18, 2013; February 26, 2014; December 10, 12, and 15, 2015; February 26, 2015; March 16, 2015; and April 2, 2015. Verification soil sampling was conducted per the *Work Instruction for Verification Sampling of the 100-H-28:3, 100-H-28:5, and 100-H-44 Waste Sites and the 100-H-28:2, 100-H-28:3, 100-H-28:4, and 100-H-28:5 Overburden Piles* (WCH 2014c) and the "100-H-28:2 and 100-H-28:5 Additional Remediation and Resampling Agreement" (WCH 2015a). Sampling was conducted to support a determination that residual contaminant concentrations in the soil meet cleanup criteria specified in the 100 Area RDR/RAWP (DOE-RL 2009b) and the Remaining Sites 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 and RAGs for the 100-H-28:2 subsite and 100-H-42 waste site. The following subsections provide additional discussion of the information used to develop the verification sampling design. The results of verification sampling are also summarized to support interim closure of the sites.

### Contaminants of Potential Concern for Verification Sampling

The COPCs for the 100-H-28:2 subsite were determined based on existing historical information, possible use of the pipelines, and confirmatory and in-process sampling results. Because the 100-H-42 waste site received influent from the 100-H-28:2 subsite, the COPCs for the 100-H-42 waste site will be the same as the 100-H-28:2 subsite.

Carbon-14, cesium-137, lead, benzo(a)anthracene, and benzo(a)pyrene exceeded the direct exposure RAGs and antimony, cadmium, chromium, copper, hexavalent chromium, lead, mercury, nickel, zinc, PCBs, pesticides, and SVOCs exceeded groundwater and/or river protection RAGs; therefore, they were retained as site COPCs for verification sampling. Total petroleum hydrocarbons, nitrate, and sulfate were detected in the confirmatory samples; therefore, they were retained as COPCs.

**Figure 5. Post-Excavation Civil Survey for the 100-H-28:2, Western Segments.**

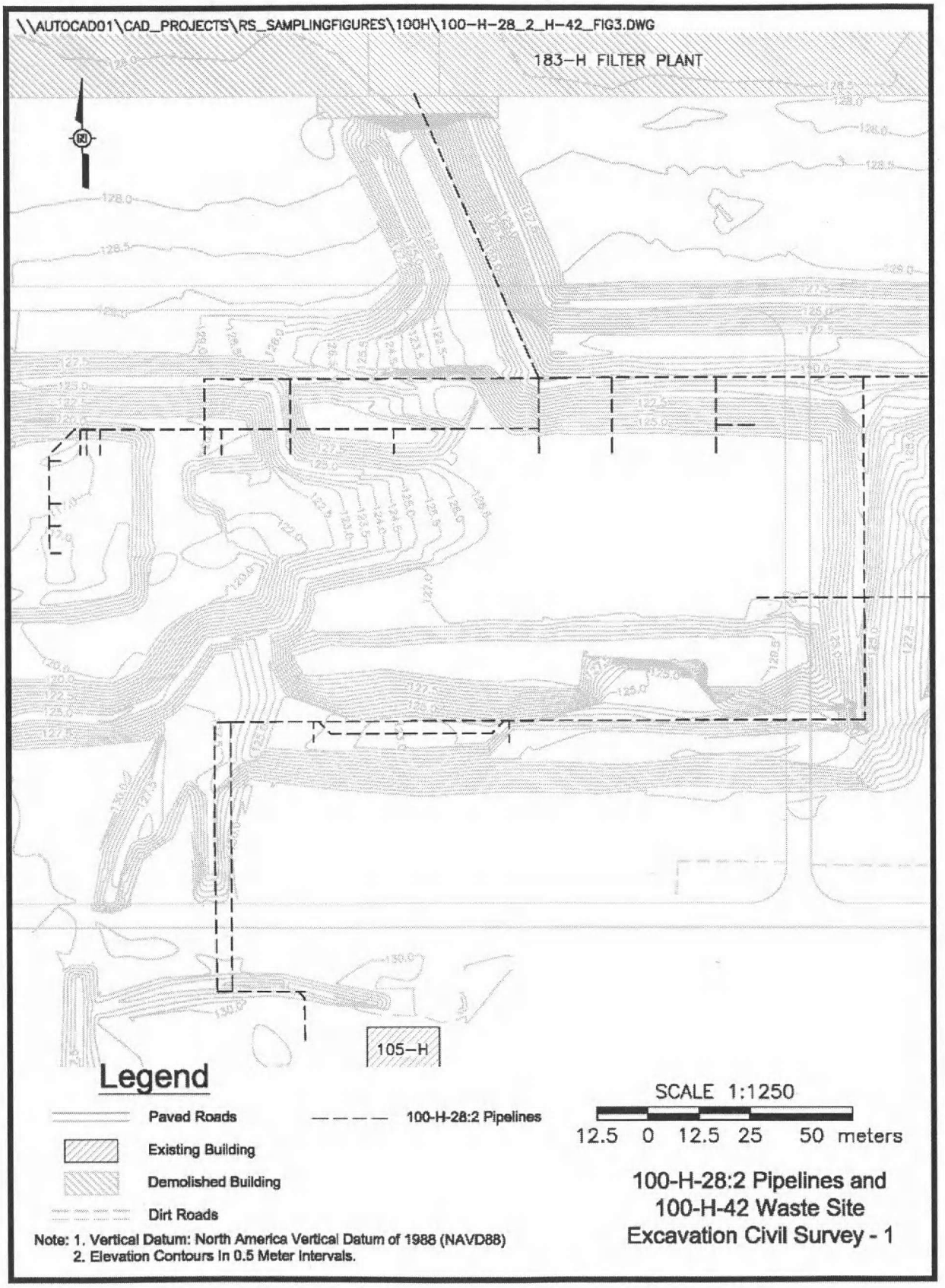


**Figure 6. Post-Excavation Civil Survey for the 100-H-28:2, Eastern Segments.**

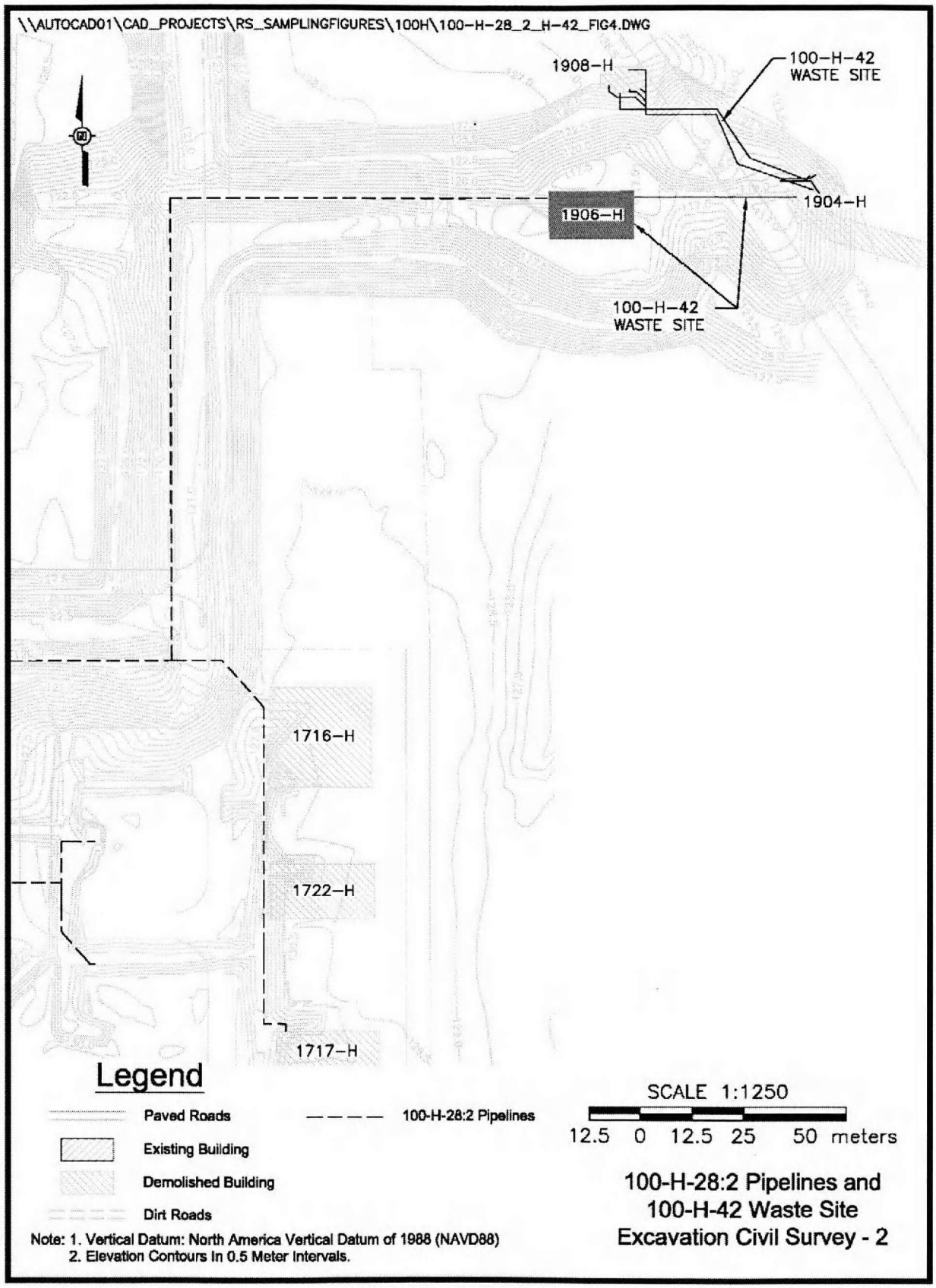


**Figure 7. Post-Excavation Boundary Survey for the 100-H-42.**

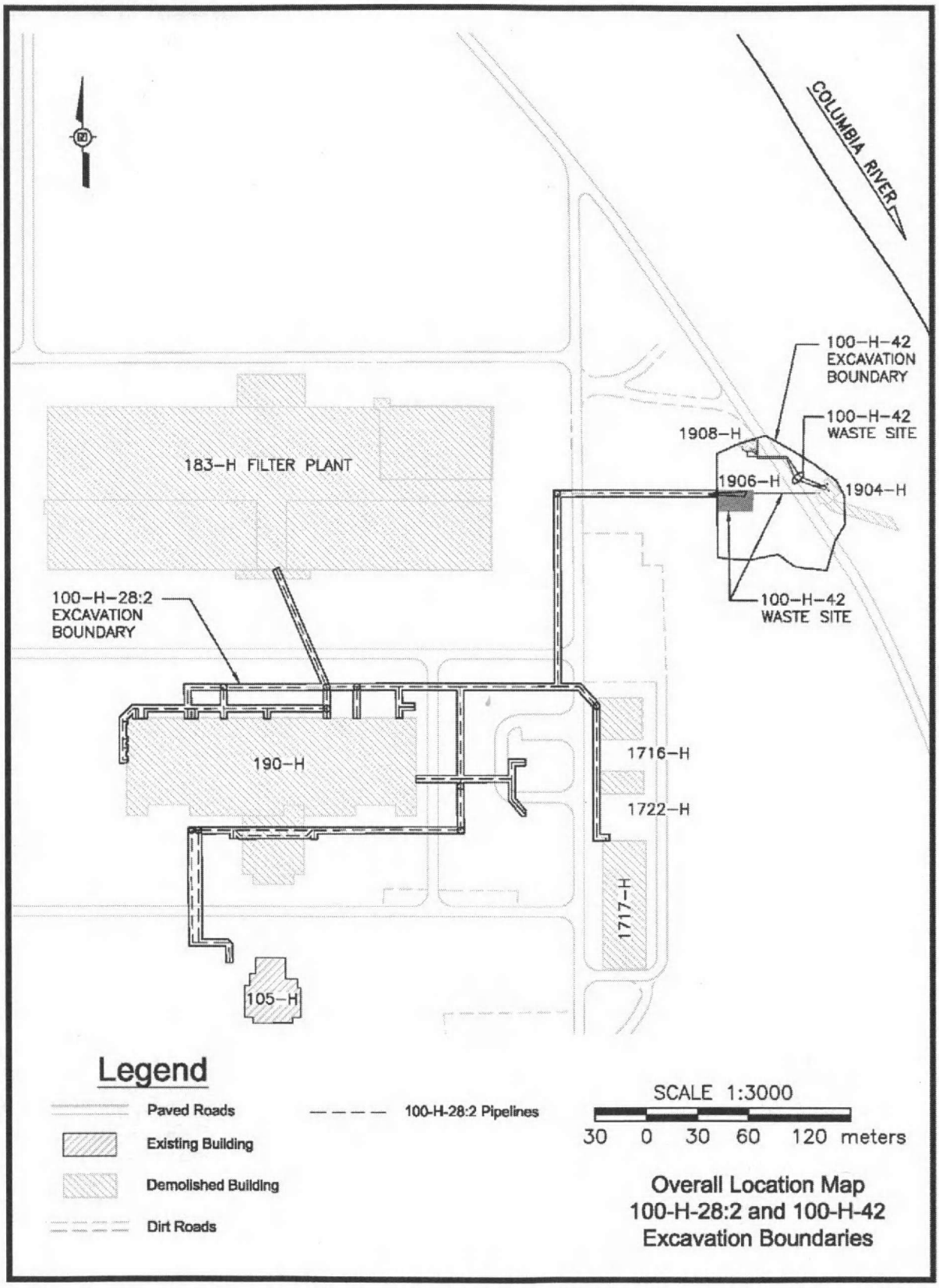


**Figure 8. Post-Excavation Walkaround Boundary Survey for the Overburden Piles.**

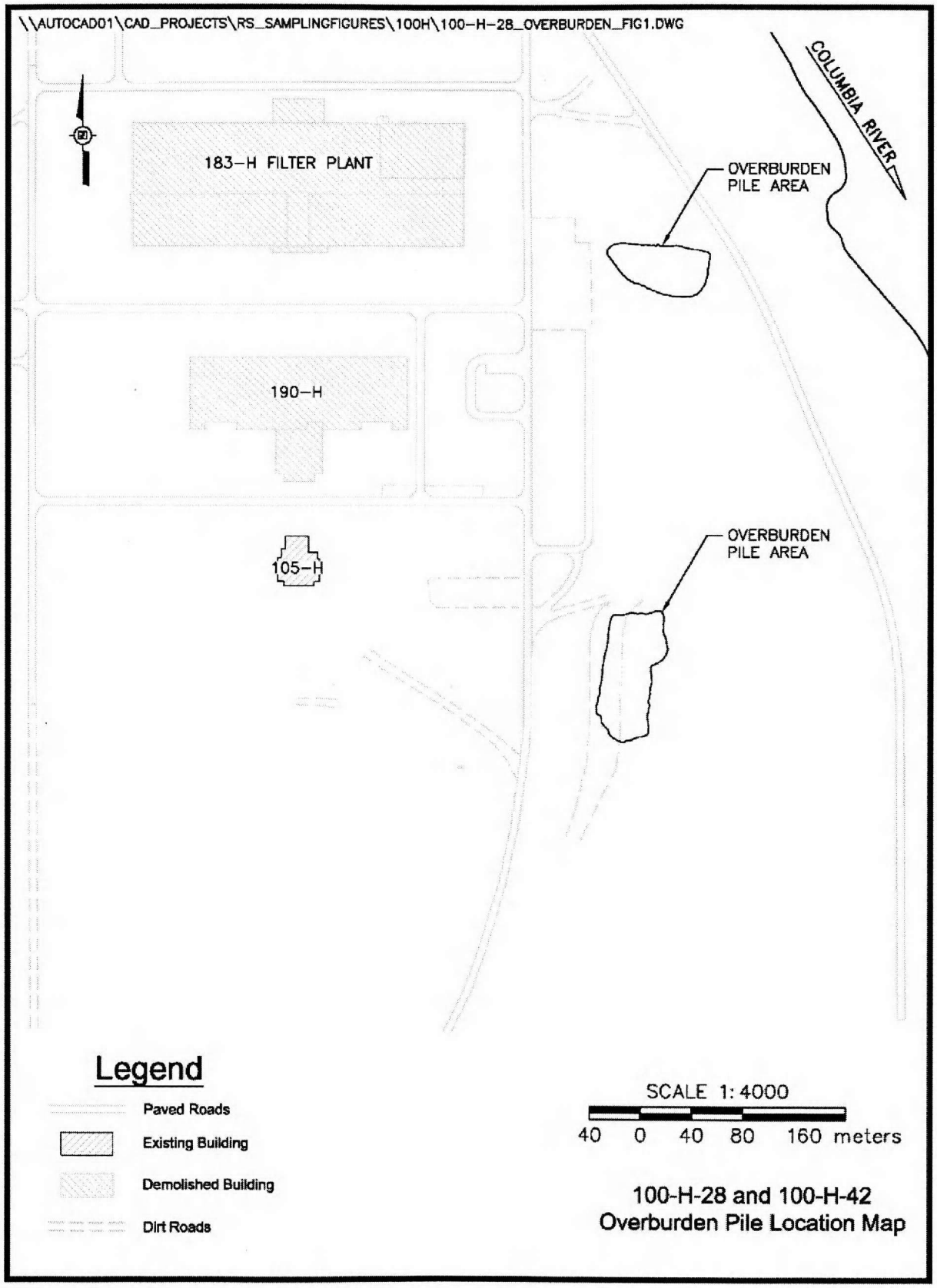
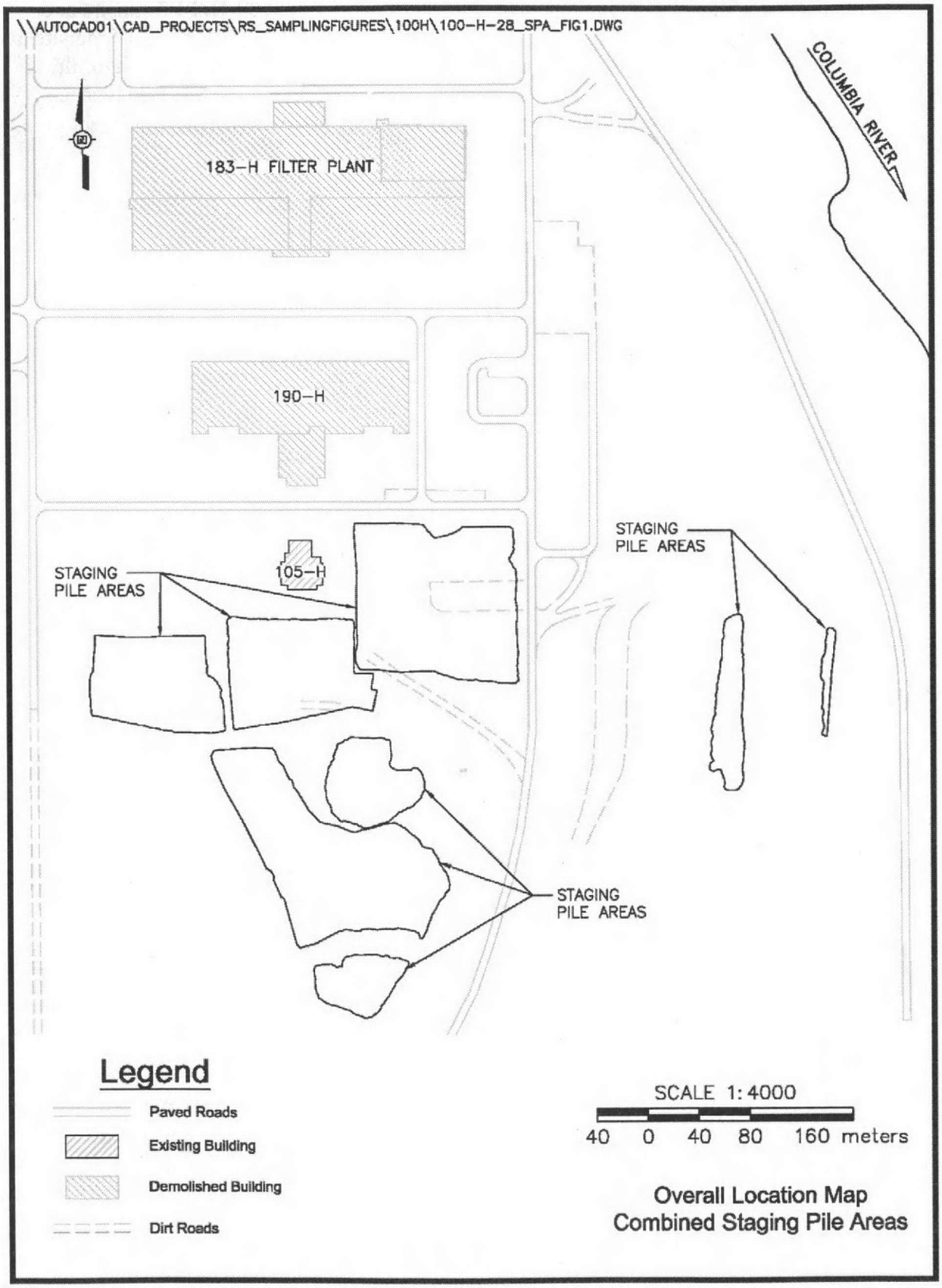


**Figure 9. Post-Excavation Walkaround Boundary Survey for the Waste SPAs.**



Although potassium-40, radium-226, radium-228, thorium-228, and thorium-232 were detected in the confirmatory samples, they are not included as COPCs for the 100-H-28:2 subsite and 100-H-42 waste site because these isotopes are unrelated to the operational history of the site and were detected below background levels (based on an assumption of secular equilibrium, the background activities for radium-228 and thorium-228 are equal to the statistical background activity of 1.32 pCi/g for thorium-232 provided in *Hanford Site Background: Part 2, Soil Background for Radionuclides* [DOE-RL 1996]).

The two overburden piles included in this verification work instruction include overburden material removed from the 100-H-42 waste site and the 100-H-28:2, 100-H-28:3, 100-H-28:4, and 100-H-28:5 subsites. The waste SPAs received waste from nine other waste sites including 100-H-28:3, 100-H-28:4, 100-H-28:5, 100-H-42, 100-H-44, 100-H-46, 100-H-48, 100-H-52, and 100-H-51:3. The COPC list determined for the 100-H-28:2 subsite and 100-H-42 waste site conservatively includes the COPCs that may be associated with the 100-H-28:3, 100-H-28:4, 100-H-28:5, 100-H-42, 100-H-44, 100-H-46, 100-H-48, 100-H-52, and 100-H-51:3 waste sites; therefore, no additional COPCs were added for the overburden piles and the waste SPAs.

The final list of COPC for the 100-H-28:2 subsite, the 100-H-42 waste site, and the associated waste SPAs includes carbon-14, cesium-137, nickel-63, inductively coupled plasma metals, mercury, hexavalent chromium, polycyclic aromatic hydrocarbon (PAH), PCBs, total petroleum hydrocarbon, SVOCs, pesticides, sulfate, pH, and nitrate/nitrite.

The analytical methods that were performed to evaluate the 100-H-28:2 subsite and the 100-H-42 waste site COPCs are provided in Table 1. The table also includes the analytical methods that were performed to evaluate the COPCs identified for the overburden soil stockpiles and the waste SPAs. The COPCs provided in the table are a cumulative list for all decision units and are not necessarily the COPCs at all of the decision units discussed in this closure document.

**Table 1. Laboratory Analytical Methods for the 100-H-28:2, 100-H-42 Waste Sites, and/or the Associated Overburden and Waste SPAs. (2 Pages)**

| Analytical Method | Contaminant 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 |
| Hexavalent chromium – EPA Method 7196 | Hexavalent chromium |
| IC anions [b] – EPA Method 300.0 [c] | Nitrate, sulfate |
| $NO_2/NO_3$ – EPA Method 353.2 | Nitrate |
| PAH – EPA Method 8310 | Polycyclic aromatic hydrocarbons |
| PCB – EPA Method 8082 | Polychlorinated biphenyls |
| pH – EPA Method 9045 | pH |
| Pesticides – EPA Method 8081 | Pesticides |
| SVOA [d] – EPA Method 8270 | Semivolatile organic compounds |
| TPH – NWTPH – Dx | Total petroleum hydrocarbons |
| GEA – gamma spectroscopy | Cesium-137, cobalt-60, europium-152, europium-154, europium-155 |
| Carbon-14 – liquid scintillation | Carbon-14 |

**Table 1. Laboratory Analytical Methods for the 100-H-28:2, 100-H-42 Waste Sites, and/or the Associated Overburden and Waste SPAs. (2 Pages)**

| Analytical Method | Contaminant of Potential Concern |
|---|---|
| Nickel-63 – liquid scintillation | Nickel-63 |

[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 in the final data package.
[b] To preclude holding time issues associated with EPA Method 300.0 for nitrates, EPA Method 353 was performed.
[c] IC anion Method 300.0 and IC anion Method 9056M are based on the same analytical procedure and for the purposes of the project are interchangeable.
[d] Because Method 8310 is specifically meant to analyze for PAH, data from this method was used preferentially over the method 8270 data for evaluation of PAH analyses

EPA = U.S. Environmental Protection Agency
GEA = gamma energy analysis
IC = ion chromatography
ICP = inductively coupled plasma
$NO_2/NO_3$ = nitrite/nitrate
NWTPH-Dx = northwest total petroleum hydrocarbons-diesel range organics
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
pH = hydrogen ion concentration
SPA = staging pile areas
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbons

## Verification Sampling Design

Four decision units were identified for the 100-H-28:2 subsite and the 100-H-42 waste site. Specifically, the 100-H-28:2 excavation, the 100-H-42 excavation, the waste SPAs, and the overburden stockpiles. A combination statistical and focused sampling design was used to evaluate the 100-H-28:2 pipeline subsite. Statistical designs were used to evaluate the 100-H-42 waste site, the waste SPAs, and the overburden soil stockpiles. Twelve statistical verification soil samples plus one duplicate were collected from each of the decision units. Two equipment blank samples were also collected.

All sampling was performed in accordance with ENV-1, *Environmental Monitoring & Management*, to fulfill the requirements of the *100 Area Remedial Action Sampling and Analysis Plan* (DOE-RL 2009a). All samples were grab samples collected at the predetermined coordinates identified in Table 2. The verification sample locations are shown in Figures 10 through 13. During staking of the sample locations, it was noted that EXC2-5 landed on the concrete monolith that remains, and SPA-9 fell within the 100-H-51:2 excavation. Therefore, with U.S. Department of Energy, Richland Operations Office and Washington State Department of Ecology concurrence, sample locations EXC2-5 and SPA-9 were relocated. The coordinates provided in Table 2 are for the new sample locations.

## Verification Sampling Results

All verification samples were collected for full protocol laboratory analysis and analyzed using EPA-approved analytical methods. Evaluation of the verification data was performed by direct comparison of the statistical or maximum sample results for each COPC against the cleanup criteria.

**Table 2. 100-H-28:2 and 100-H-42 Waste Sites Excavation and Associated Overburden and Staging Pile Areas Verification Sample Summary. (3 Pages)**

| Sample Location | HEIS Sample Number | Washington State Plane | | Sample Analysis [a] |
|---|---|---|---|---|
| | | Northing | Easting | |
| **100-H-28:2 Subsite Excavation (Excavation 1)** | | | | |
| EXC1-1 | J1V543 | 152592.0 | 577734.3 | ICP metals [b], mercury, hexavalent chromium, IC anions [c], nitrates/nitrites [d], PCBs, SVOA [e], TPH, PAH [e], pesticides, pH, GEA, carbon-14, nickel-63 |
| EXC1-2 | J1V270 | 152620.9 | 577894.2 | |
| EXC1-3 | J1V271 | 152622.0 | 577788.5 | |
| EXC1-4 | J1V272 | 152646.7 | 577924.7 | |
| Duplicate of J1V272 | J1V285 | 152646.7 | 577924.7 | |
| EXC1-5 | J1V273 | 152681.9 | 577893.3 | |
| EXC1-6 | J1V274 | 152691.3 | 577834.5 | |
| EXC1-7 | J1V275 | 152695.4 | 577857.2 | |
| EXC1-8 | J1V276 | 152707.8 | 577925.3 | |
| EXC1-9 | J1V277 | 152704.7 | 577796.9 | |
| EXC1-10 | J1V278 | 152706.9 | 577819.6 | |
| EXC1-11 | J1V279 | 152726.5 | 577804.7 | |
| EXC1-12 | J1V280 | 152820.5 | 577986.9 | |
| FS-1 [f] | J1V281 | 152622.9 | 577854.8 | |
| FS-2 [g] | J1V282 | 152751.8 | 577806.5 | |
| FS-3 [h] | J1V283 | 152768.4 | 577788.2 | |
| FS-4 [i] | J1V284 | 152619.0 | 577973.7 | |
| RC-1 [j] | J1TF83 | 152650.6 | 577892.0 | ICP metals [b], mercury, hexavalent chromium, IC anions [c], PCBs, SVOA, TPH, pesticides |
| RC-2 [j] | J1TF82 | 152627.6 | 577893.2 | |
| RC-3 [j] | J1T5W6 | 152574.7 | 577734.0 | |
| Equipment blank | J1V544 | NA | NA | ICP metals [b], mercury, SVOA |
| **100-H-42 Waste Site Excavation (Excavation 2)** | | | | |
| EXC2-1 | J1V286 | 152780.0 | 578097.6 | ICP metals [b], mercury, hexavalent chromium, IC anions [c], nitrates/nitrites [d], PCBs, SVOA [e], TPH, PAH [e], pesticides, pH, GEA, carbon-14, nickel-63 |
| EXC2-2 | J1V287 | 152798.2 | 578066.0 | |
| EXC2-3 | J1V288 | 152798.2 | 578087.1 | |
| EXC2-4 | J1V289 | 152798.2 | 578108.2 | |
| EXC2-5 | J1V290 | 152808.9 | 578055.7 | |
| EXC2-6 | J1V291 | 152816.4 | 578076.6 | |
| EXC2-7 | J1V292 | 152816.4 | 578097.6 | |
| Duplicate of J1V292 | J1V298 | 152816.4 | 578097.6 | |
| EXC2-8 | J1V293 | 152816.4 | 578118.7 | |
| EXC2-9 | J1V294 | 152834.7 | 578045.0 | |
| EXC2-10 | J1V295 | 152834.7 | 578066.0 | |
| EXC2-11 | J1V296 | 152834.7 | 578087.1 | |
| EXC2-12 | J1V297 | 152852.9 | 578076.6 | |

**Table 2. 100-H-28:2 and 100-H-42 Waste Sites Excavation and Associated Overburden and Staging Pile Areas Verification Sample Summary. (3 Pages)**

| Sample Location | HEIS Sample Number | Washington State Plane | | Sample Analysis [a] |
|---|---|---|---|---|
| | | Northing | Easting | |
| **Staging Pile Areas (100-H-28:2, 100-H-28:3, 100-H-28:4, 100-H-28:5, 100-H-42, 100-H-44, 100-H-46, 100-H-48, 100-H-52, and 100-H-51:3)** | | | | |
| SPA-1 | J1V4L5 | 152219.6 | 577840.2 | ICP metals [b], mercury, hexavalent chromium, IC anions [c], nitrates/nitrites [d], PCBs, SVOA [e], TPH, PAH [e], pesticides, pH, GEA, carbon-14, nickel-63 |
| SPA-2 | J1V4L6 | 152281.8 | 577804.3 | |
| SPA-3 | J1V4L7 | 152281.8 | 577876.1 | |
| SPA-4 | J1V4L8 | 152344.0 | 577768.4 | |
| SPA-5 | J1V4L9 | 152344.0 | 577840.2 | |
| SPA-6 | J1V4M0 | 152406.2 | 577660.7 | |
| SPA-7 | J1V4M1 | 152406.2 | 577732.5 | |
| SPA-8 | J1V4M2 | 152468.4 | 577624.8 | |
| SPA-9 | J1V4M3 | 152470.1 | 577694.5 | |
| SPA-10 | J1V4M4 | 152468.4 | 577768.4 | |
| SPA-11 | J1V4M5 | 152468.4 | 577840.2 | |
| SPA-12 | J1V4M6 | 152468.4 | 577912.0 | |
| SPA-13 | J1V4M7 | 152468.4 | 578127.4 | |
| SPA-14 | J1V4M8 | 152468.4 | 578199.3 | |
| SPA-15 | J1V4M9 | 152530.6 | 577876.1 | |
| Duplicate of J1V4L5 | J1V4N0 | 152219.6 | 577840.2 | |
| **Overburden Stockpiles (100-H-42, 100-H-28:2, 100-H-28:3, 100-H-28:4 and 100-H-28:5)** | | | | |
| OVB-1 | J1V255 | 152397.6 | 578049.4 | ICP metals [b], mercury, hexavalent chromium, IC anions [c], nitrates/nitrites [d], PCBs, SVOA [c], TPH, PAH [e], pesticides, pH, GEA, carbon-14, nickel-63 |
| OVB-2 | J1V256 | 152419.2 | 578036.9 | |
| OVB-3 | J1V257 | 152440.8 | 578024.4 | |
| OVB-4 | J1V258 | 152440.8 | 578049.4 | |
| OVB-5 | J1V259 | 152462.4 | 578036.9 | |
| OVB-6 | J1V260 | 152462.4 | 578061.8 | |
| OVB-7 | J1V261 | 152484.0 | 578049.4 | |
| OVB-8 | J1V262 | 152743.0 | 578074.3 | |
| OVB-9 | J1V4N1 | 152743.0 | 578099.2 | |
| OVB-10 | J1V264 | 152764.6 | 578036.9 | |
| OVB-11 | J1V265 | 152764.6 | 578061.8 | |
| OVB-12 | J1V4N2 | 152764.6 | 578086.7 | |
| Duplicate of J1V4N1 | J1V4N3 | 152743.0 | 578099.2 | |

## Table 2. 100-H-28:2 and 100-H-42 Waste Sites Excavation and Associated Overburden and Staging Pile Areas Verification Sample Summary. (3 Pages)

| Sample Location | HEIS Sample Number | Washington State Plane | | Sample Analysis [a] |
|---|---|---|---|---|
| | | Northing | Easting | |
| Equipment blank | J1V4N4 | NA | NA | ICP metals [b], mercury, SVOA |

[a] Grab samples were collected at each location and sample analysis was performed as defined in Table 1, Laboratory Analytical Methods. All sampling was performed in accordance with ENV-1, *Environmental Monitoring and Management* consistent with the 100 Area SAP (DOE RL 2009a) requirements.
[b] The expanded list of ICP metals included antimony, arsenic, barium, beryllium, boron, cadmium, chromium (total), cobalt, copper, lead, manganese, magnesium, molybdenum, nickel, silver, selenium, vanadium, and zinc in the analytical results package.
[c] The expanded list of IC anions included bromide, chloride fluoride, nitrate, nitrite, phosphate and sulfate in the analytical results package.
[d] To preclude holding time issues associated with EPA Method 300.0 (or Method 9056M, depending on the laboratory performing the analysis) for nitrites and nitrates, EPA Method 353.2 was performed.
[e] Because Method 8310 is specifically meant to analyze for PAH, data from this method was used preferentially over the Method 8270 data for evaluation of PAH analyses.
[f] Focused sample located where the french drain containing red rocks was remediated.
[g] Focused sample located where an anomalous drum was discovered and remediated. In-process sample detected PCBs, SVOCs and pesticides above direct exposure remedial action goals.
[h] One focused soil sample was collected of soils underlying a pipeline segment that could not be remediated safely due to the remaining 183-H Building concrete slab.
[i] One focused sample was collected from the excavation section that served the 1700 series buildings.
[j] Verification samples RC-1, RC-2 and RC-3 were collected from 100-H-28:2 excavation prior to backfilling a road crossing for field road access purposes.

EPA = U.S. Environmental Protection Agency
GEA = gamma energy analysis
HEIS = Hanford Environmental Information System
IC = ion chromatography
ICP = inductively coupled plasma
NA = not applicable
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
pH = hydrogen ion concentration
SAP = sampling analysis plan
SVOA = semivolatile organic analysis
SVOC = semivolatile organic compound
TPH = total petroleum hydrocarbons

**Figure 10. The 100-H-28:2 Excavation (Excavation 1) Verification Sample Locations.**

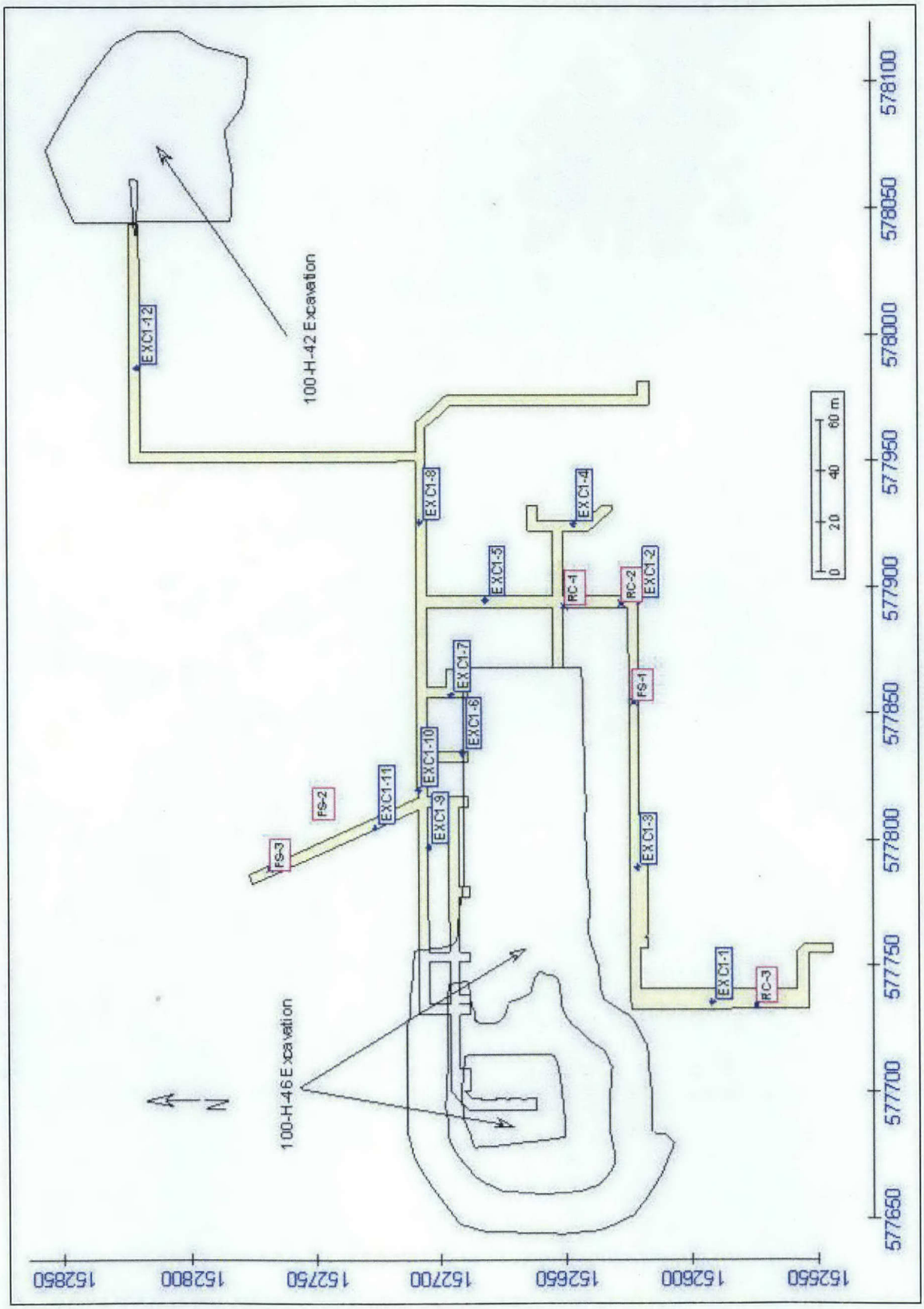


**Figure 11. The 100-H-42 Excavation (Excavation 2) Verification Sample Locations.**

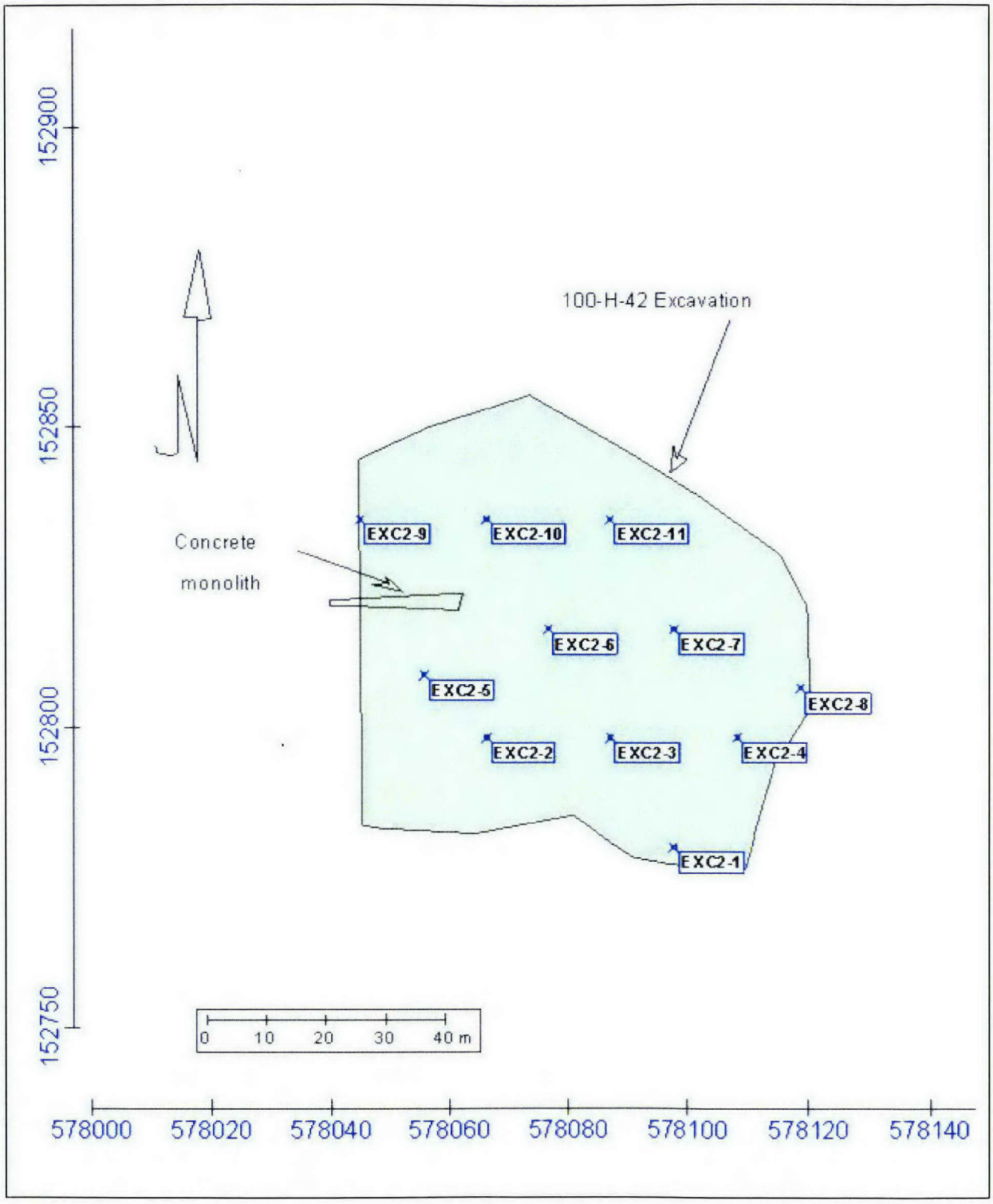


**Figure 12. Overburden Soil Stockpiles Verification Sample Locations.**

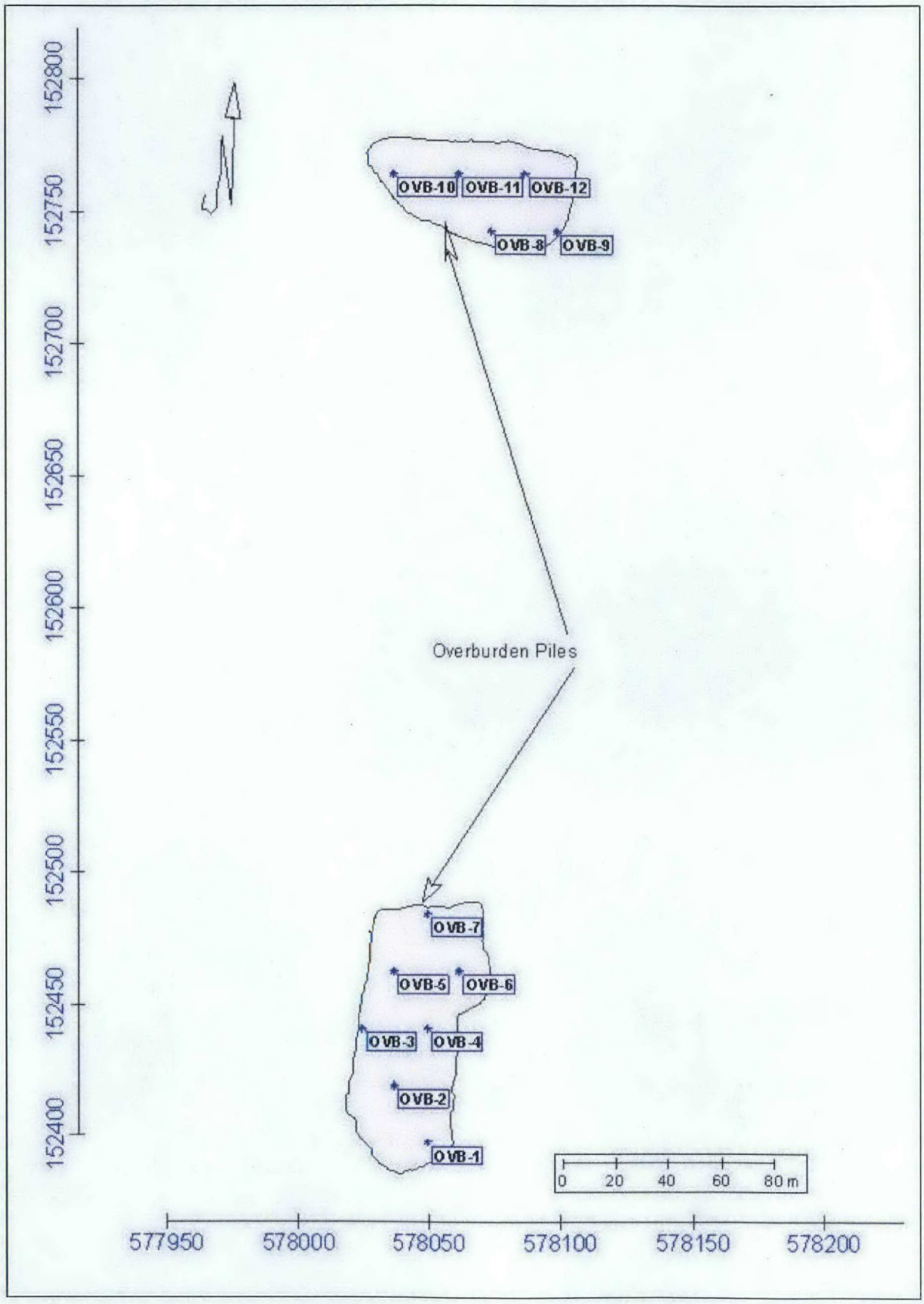
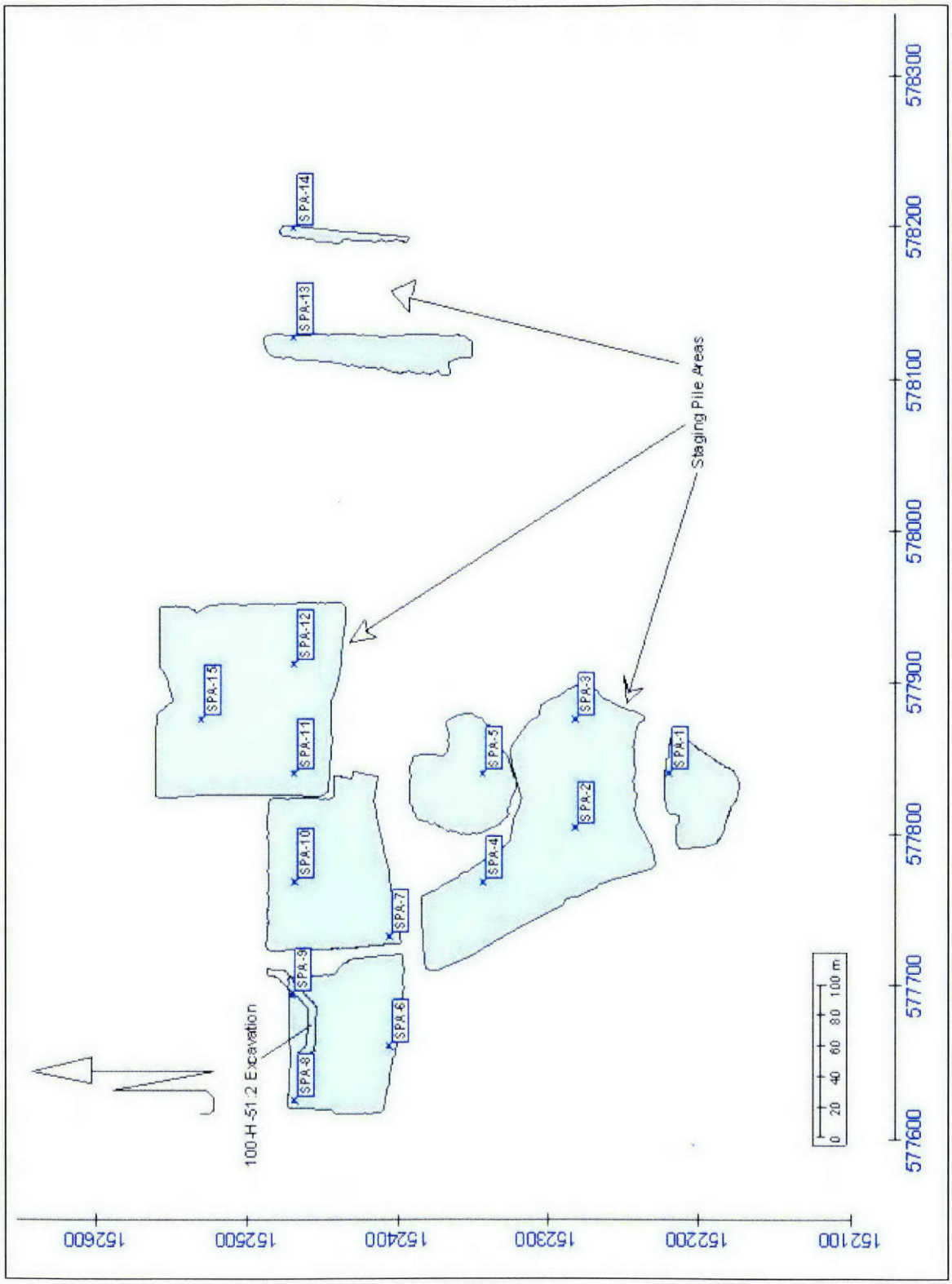


**Figure 13. Staging Pile Areas Verification Sample Locations.**



Comparisons of the results for the site COPCs against the RAGs are summarized in Tables 3 through 7. Contaminants that were not detected by laboratory analysis are excluded from these tables. Calculated cleanup levels are not presented in the Cleanup Levels and Risk Calculations Database (Ecology 2015) under WAC 173-340-740(3) for calcium, magnesium, potassium, silicon, and sodium. The EPA's *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual* (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 tables. Because EPA Method 8310 (PAH) is specifically meant to analyze for PAH, data from this method was used preferentially over EPA Method 8270 (semivolatile organic analysis). Therefore, PAH data from Method 8270 are excluded from the tables.

**Table 3. Comparison of Contaminant Concentrations to Action Levels for the 100-H-28:2 Excavation 1 Verification Samples. (2 Pages)**

| COPC | Statistical Result [b] (mg/kg) | Remedial Action Goals [a] | | | Do the Results Exceed RAGs? | Do the Results Pass RESRAD Modeling? |
|---|---|---|---|---|---|---|
| | | Direct Exposure | Soil Cleanup Level for Groundwater Protection | Soil Cleanup Level for River Protection | | |
| Antimony [c] | 0.51 (<BG) | 32 | 5 [d] | 5 [d] | No | -- |
| Arsenic | 6.7 | 20 [d] | 20 [d] | 20 [d] | No | -- |
| Barium | 79.7 (<BG) | 5,600 | 200 | 400 | No | -- |
| Beryllium | 0.85 (<BG) | 10.4 [e] | 1.51 [d] | 1.51 [d] | No | -- |
| Boron [f] | 25.7 | 7,200 | 320 | -- [g] | No | -- |
| Cadmium [c] | 0.12 (<BG) | 13.9 [e] | 0.81 [d] | 0.81 [d] | No | -- |
| Chromium (total) | 13.0 (<BG) | 80,000 | 18.5 [d] | 18.5 [d] | No | -- |
| Cobalt | 5.7 (<BG) | 24 | 15.7 [d] | -- [g] | No | -- |
| Copper | 14.9 (<BG) | 2,960 | 59.2 | 22.0 [d] | No | -- |
| Hexavalent chromium [f] | 0.317 | 2.1 [e] | 4.8 | 2 | No | -- |
| Lead | 17.3 | 353 | 10.2 [d] | 10.2 [d] | Yes | Yes [h] |
| Manganese | 232 (<BG) | 3,760 | 512 [d] | 512 [d] | No | -- |
| Mercury | 0.12 (<BG) | 24 | 0.33 [d] | 0.33 [d] | No | -- |
| Molybdenum [f] | 0.31 | 400 | 8 | -- [g] | No | -- |
| Nickel | 14.1 (<BG) | 1,600 | 19.1 [d] | 27.4 | No | -- |
| Vanadium | 36.4 (<BG) | 560 | 85.1 [d] | -- [g] | No | -- |
| Zinc | 37.1 (<BG) | 24,000 | 480 | 67.8 [d] | No | -- |
| Chloride | 30.1 (<BG) | -- | 25,000 | -- [g] | No | -- |
| Fluoride | 1.1 (<BG) | 4,800 | 96 | 400 | No | -- |
| Nitrogen in nitrate | 1.2 (<BG) | 128,000 | 1,000 | 2,000 | No | -- |
| Nitrogen in nitrate and nitrite | 2.9 (<BG) | 128,000 | 1,000 | 2,000 | No | -- |
| Sulfate | 23.0 (<BG) | -- | 25,000 | -- [g] | No | -- |
| TPH – diesel range EXT | 21.0 | 200 | 200 | 200 | No | -- |
| TPH – diesel range | 9.1 | 200 | 200 | 200 | No | -- |
| 4-4'-DDE | 0.0011 | 2.94 | 0.0257 | 0.0033 [i] | No | -- |
| 4-4'-DDT | 0.0029 | 2.94 | 0.0257 | 0.0033 [i] | No | -- |
| Aroclor-1254 | 0.024 | 0.5 | 0.017 [i] | 0.017 [i] | Yes | Yes [h] |

## Table 3. Comparison of Contaminant Concentrations to Action Levels for the 100-H-28:2 Excavation 1 Verification Samples. (2 Pages)

| COPC | Statistical Result [b] (mg/kg) | Remedial Action Goals [a] | | | Do the Results Exceed RAGs? | Do the Results Pass RESRAD Modeling? |
|---|---|---|---|---|---|---|
| | | Direct Exposure | Soil Cleanup Level for Groundwater Protection | Soil Cleanup Level for River Protection | | |
| Aroclor-1260 | 0.017 | 0.5 | 0.017 [i] | 0.017 [i] | No | -- |
| Acenaphthene | 0.016 | 4,800 | 96 | 129 | No | -- |
| Benzo(a)anthracene | 0.032 | 1.37 | 0.015 [i] | 0.015 [i] | Yes | Yes [h] |
| Benzo(a)pyrene | 0.047 | 0.137 | 0.015 [i] | 0.015 [i] | Yes | Yes [h] |
| Benzo(b)fluoranthene | 0.037 | 1.37 | 0.015 [i] | 0.015 [i] | Yes | Yes [h] |
| Benzo(ghi)perylene [j] | 0.043 | 2,400 | 48 | 192 | No | -- |
| Benzo(k)fluoranthene | 0.013 | 1.37 | 0.015 [i] | 0.015 [i] | No | -- |
| Chrysene | 0.029 | 13.7 | 0.12 | 0.1 [i] | No | -- |
| Fluoranthene | 0.078 | 3,200 | 64 | 18.0 | No | -- |
| Fluorene | 0.012 | 3,200 | 64 | 260 | No | -- |
| Indeno(1,2,3-cd)pyrene | 0.025 | 1.37 | 0.33 [i] | 0.33 [i] | No | -- |
| Phenanthrene [j] | 0.070 | 24,000 | 240 | 1,920 | No | -- |
| Pyrene | 0.082 | 2,400 | 48 | 192 | No | -- |
| 1,3-Dichlorobenzene | 0.014 | 2,400 | 24.0 | 80 | No | -- |
| 1,4-Dichlorobenzene | 0.014 | 41.7 | 0.33 [i] | 0.972 | No | -- |
| 2,4,5-Trichlorophenol | 0.016 | 8,000 | 80 | -- [g] | No | -- |
| 2,4,6-Trichlorophenol | 0.013 | 90.9 | 0.795 | 0.42 | No | -- |
| 2-Chloronaphthalene | 0.018 | 6,400 | 64 | 206 | No | -- |

[a] Remedial action goals obtained from the 100 Area RDR/RAWP (DOE-RL 2009b).
[b] Maximum or 95% UCL result, depending on data censorship, as described in the *100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations* (Attachment C).
[c] Hanford Site-specific background value is not available. Value used is from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).
[d] Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d). 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 Area RDR/RAWP (DOE-RL 2009b).
[e] Carcinogenic cleanup level calculated based on the inhalation exposure pathway per WAC 173-340-750(3), (Method B for air quality) and an airborne particulate mass loading rate of 0.0001 g/m$^3$ (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).
[f] No Hanford Site-specific or Washington State background value available.
[g] No parameters (bioconcentration factors or AWQC values) are available from the Cleanup Levels and Risk Calculations Database (Ecology 2015) or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], [Method B for surface waters]).
[h] Based on RESRAD modeling discussed in Appendix C of the 100 Area RDR/RAWP (DOE-RL 2009b), the residual concentrations of lead, aroclor-1254, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene are not expected to migrate more than 1.8 m (5.9 ft) vertically in 1,000 years (based on the lowest $K_d$ of the contaminants [lead with a $K_d$ of 30 mL/g]). The vadose zone underlying the 100-H-28:2 and 100-H-42 excavations is 2.5 m (8.2 ft) thick.
[i] Where cleanup levels are less than RDLs, cleanup levels default to RDLs per WAC 173-340-707(2).
[j] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals.
Contaminant: benzo(ghi)perylene – surrogate: pyrene; phenanthrene – surrogate: anthracene

-- = not applicable
AWQC = ambient water quality criteria
BG = background
COPC = contaminant of potential concern
DDE = dichlorodiphenyldichloroethylene
DDT = dichlorodiphenyltrichloroethane
$K_d$ = distribution coefficient
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = remedial design report/remedial action work plan
RESRAD = RESidual RADioactivity (dose model)
TPH = total petroleum hydrocarbons
UCL = upper confidence limit
WAC = *Washington Administrative Code*

**Table 4. Comparison of Contaminant Concentrations to Action Levels for the 100-H-42 Excavation 2 Verification Samples. (2 Pages)**

| COPC | Statistical Result [b] (pCi/g) | Site Lookup Values [a] | | | Do the Results Exceed RAGs? | Do the Results Pass RESRAD Modeling? |
|---|---|---|---|---|---|---|
| | | Shallow Zone Lookup Value | Groundwater Protection Lookup Value | River Protection Lookup Value | | |
| Cesium-137 | 0.00539 (<BG) | 6.2 | 1,465 | 2,930 | No | -- |
| Europium-152 | 0.0151 | 3.3 | -- [c] | -- [c] | No | -- |
| **COPC** | **Statistical Result [b] (mg/kg)** | **Remedial Action Goals [a]** | | | **Do the Results Exceed RAGs?** | **Do the Results Pass RESRAD Modeling?** |
| | | **Direct Exposure** | **Soil Cleanup Level for Groundwater Protection** | **Soil Cleanup Level for River Protection** | | |
| Arsenic | 4.1 (<BG) | 20 [d] | 20 [d] | 20 [d] | No | -- |
| Barium | 55.9 (<BG) | 5,600 | 200 | 400 | No | -- |
| Boron [e] | 1.0 | 7,200 | 320 | -- [f] | No | -- |
| Cadmium [g] | 0.095 (<BG) | 13.9 [h] | 0.81 [d] | 0.81 [d] | No | -- |
| Chromium (total) | 10.2 (<BG) | 80,000 | 18.5 [d] | 18.5 [d] | No | -- |
| Cobalt | 6.7 (<BG) | 24 | 15.7 [d] | -- [f] | No | -- |
| Copper | 15.3 (<BG) | 2,960 | 59.2 | 22.0 [d] | No | -- |
| Hexavalent chromium [e] | 0.356 | 2.1 [h] | 4.8 | 2 | No | -- |
| Lead | 12.0 | 353 | 10.2 [d] | 10.2 [d] | Yes | Yes [i] |
| Manganese | 257 (<BG) | 3,760 | 512 [d] | 512 [d] | No | -- |
| Mercury | 0.015 (<BG) | 24 | 0.33 [d] | 0.33 [d] | No | -- |
| Nickel | 10.4 (<BG) | 1,600 | 19.1 [d] | 27.4 | No | -- |
| Vanadium | 47.0 (<BG) | 560 | 85.1 [d] | -- [f] | No | -- |
| Zinc | 33.5 (<BG) | 24,000 | 480 | 67.8 [d] | No | -- |
| Fluoride | 0.86 (<BG) | 4,800 | 96 | 400 | No | -- |
| Nitrogen in nitrate | 2.1 (<BG) | 128,000 | 1,000 | 2,000 | No | -- |
| Nitrogen in nitrate and nitrite | 1.8 (<BG) | 128,000 | 1,000 | 2,000 | No | -- |
| Sulfate | 11.8 (<BG) | -- | 25,000 | -- [f] | No | -- |
| TPH – diesel range EXT | 4.6 | 200 | 200 | 200 | No | -- |
| TPH – diesel range | 3.1 | 200 | 200 | 200 | No | -- |
| 4, 4'-DDE | 0.0050 | 2.94 | 0.0257 | 0.0033 [j] | Yes | Yes [i] |
| 4, 4'-DDT | 0.00068 | 2.94 | 0.0257 | 0.0033 [j] | No | -- |
| Benzo(a)anthracene | 0.016 | 1.37 | 0.015 [j] | 0.015 [j] | Yes | Yes [i] |
| Benzo(a)pyrene | 0.026 | 0.137 | 0.015 [j] | 0.015 [j] | Yes | Yes [i] |
| Benzo(b)fluoranthene | 0.028 | 1.37 | 0.015 [j] | 0.015 [j] | Yes | Yes [i] |
| Benzo(ghi)perylene [k] | 0.025 | 2,400 | 48 | 192 | No | -- |
| Benzo(k)fluoranthene | 0.011 | 1.37 | 0.015 [j] | 0.015 [j] | No | -- |
| Chrysene | 0.023 | 13.7 | 0.12 | 0.1 [j] | No | -- |
| Fluoranthene | 0.033 | 3,200 | 64 | 18.0 | No | -- |
| Indeno(1,2,3-cd)pyrene | 0.021 | 1.37 | 0.33 [j] | 0.33 [j] | No | -- |

## Table 4. Comparison of Contaminant Concentrations to Action Levels for the 100-H-42 Excavation 2 Verification Samples. (2 Pages)

| COPC | Statistical Result [b] (mg/kg) | Remedial Action Goals [a] | | | Do the Results Exceed RAGs? | Do the Results Pass RESRAD Modeling? |
|---|---|---|---|---|---|---|
| | | Direct Exposure | Soil Cleanup Level for Groundwater Protection | Soil Cleanup Level for River Protection | | |
| Phenanthrene [k] | 0.016 | 24,000 | 240 | 1,920 | No | -- |
| Pyrene | 0.034 | 2,400 | 48 | 192 | No | -- |

[a] Lookup values and remedial action goals obtained from the 100 Area RDR/RAWP (DOE-RL 2009b).
[b] Maximum or 95% UCL result, depending on data censorship, as described in the *100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations* (Attachment C).
[c] No value; because the $K_d$ value for this contaminant is greater than 80 mL/g, RESRAD modeling discussed in Appendix C of the 100 Area RDR/RAWP (DOE-RL 2009b) predicts that the contaminant will show no migration within the 100 Area vadose zone, and no impact on groundwater or the Columbia River.
[d] Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d). 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 Area RDR/RAWP (DOE-RL 2009b).
[e] No Hanford Site-specific or Washington State background value available.
[f] No parameters (bioconcentration factors or AWQC values) are available from the Cleanup Levels and Risk Calculations Database (Ecology 2015) or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], [Method B for surface waters]).
[g] Hanford Site-specific background value is not available. Value used is from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).
[h] Carcinogenic cleanup level calculated based on the inhalation exposure pathway per WAC 173-340-750(3), (Method B for air quality) and an airborne particulate mass loading rate of 0.0001 g/m$^3$ (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).
[i] Based on RESRAD modeling discussed in Appendix C of the 100 Area RDR/RAWP (DOE-RL 2009b), the residual concentrations of lead, 4, 4'-DDE, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene are not expected to migrate more than 1.8 m (5.9 ft) vertically in 1,000 years (based on the lowest $K_d$ of the contaminants [lead with a $K_d$ of 30 mL/g]). The vadose zone underlying the 100-H-28:2 and 100-H-42 excavations is 2.5 m (8.2 ft) thick.
[j] Where cleanup levels are less than RDLs, cleanup levels default to RDLs per WAC 173-340-707(2).
[k] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals.
Contaminant: benzo(ghi)perylene; surrogate: pyrene
Contaminant: phenanthrene; surrogate: anthracene

-- = not applicable
AWQC = ambient water quality criteria
BG = background
COPC = contaminant of potential concern
DDE = dichlorodiphenyldichloroethylene
DDT = dichlorodiphenyltrichloroethane
$K_d$ = distribution coefficient
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = remedial design report/remedial action work plan
RESRAD = RESidual RADioactivity (dose model)
TPH = total petroleum hydrocarbons
UCL = upper confidence limit
WAC = *Washington Administrative Code*

**Table 5. Comparison of Contaminant Concentrations to Action Levels for the 100-H-28:2 and 100-H-42 Staging Pile Area Verification Samples. (2 Pages)**

| COPC | Statistical Result [b] (pCi/g) | Site Lookup Values [a] | | | Do the Results Exceed RAGs? | Do the Results Pass RESRAD Modeling? |
|---|---|---|---|---|---|---|
| | | Shallow Zone Lookup Value | Groundwater Protection Lookup Value | River Protection Lookup Value | | |
| Cesium-137 | 0.0844 (<BG) | 6.2 | 1,465 | 2,930 | No | -- |
| Europium-152 | 0.0574 | 3.3 | -- [c] | -- [c] | No | -- |
| Europium-155 | 0.0365 (<BG) | 125 | -- [c] | -- [c] | No | -- |
| Carbon-14 | 0.0910 | 8.69 | -- [c] | -- [c] | No | -- |
| **COPC** | **Statistical Result [b] (mg/kg)** | **Remedial Action Goals [a]** | | | **Do the Results Exceed RAGs?** | **Do the Results Pass RESRAD Modeling?** |
| | | **Direct Exposure** | **Soil Cleanup Level for Groundwater Protection** | **Soil Cleanup Level for River Protection** | | |
| Antimony [d] | 0.50 (<BG) | 32 | 5 [e] | 5 [e] | No | -- |
| Arsenic | 15.2 | 20 [e] | 20 [e] | 20 [e] | No | -- |
| Barium | 78.2 (<BG) | 5,600 | 200 | 400 | No | -- |
| Beryllium | 0.28 (<BG) | 10.4 [f] | 1.51 [e] | 1.51 [e] | No | -- |
| Boron [g] | 3.2 | 7,200 | 320 | -- [h] | No | -- |
| Cadmium [d] | 0.22 (<BG) | 13.9 [f] | 0.81 [e] | 0.81 [e] | No | -- |
| Chromium (total) | 11.3 (<BG) | 80,000 | 18.5 [e] | 18.5 [e] | No | -- |
| Cobalt | 6.7 (<BG) | 24 | 15.7 [e] | -- [h] | No | -- |
| Copper | 16.4 (<BG) | 2,960 | 59.2 | 22.0 [e] | No | -- |
| Hexavalent chromium [g] | 0.305 | 2.1 [f] | 4.8 | 2 | No | -- |
| Lead | 65.0 | 353 | 10.2 [e] | 10.2 [e] | Yes | Yes [i] |
| Manganese | 307 (<BG) | 3,760 | 512 [e] | 512 [e] | No | -- |
| Mercury | 0.019 (<BG) | 24 | 0.33 [e] | 0.33 [e] | No | -- |
| Molybdenum [g] | 0.29 | 400 | 8 | -- [h] | No | -- |
| Nickel | 12.0 (<BG) | 1,600 | 19.1 [e] | 27.4 | No | -- |
| Silver | 0.14 (<BG) | 400 | 8 | 0.73 [e] | No | -- |
| Vanadium | 43.3 (<BG) | 560 | 85.1 [e] | -- [h] | No | -- |
| Zinc | 38.2 (<BG) | 24,000 | 480 | 67.8 [e] | No | -- |
| Chloride | 9.9 (<BG) | -- | 25,000 | -- [h] | No | -- |
| Fluoride | 1.8 (<BG) | 4,800 | 96 | 400 | No | -- |
| Nitrogen in nitrate | 15.2 | 128,000 | 1,000 | 2,000 | No | -- |
| Nitrogen in nitrate and nitrite | 6.8 (<BG) | 128,000 | 1,000 | 2,000 | No | -- |
| Sulfate | 64.0 (<BG) | -- | 25,000 | -- [h] | No | -- |
| TPH – diesel range EXT | 18 | 200 | 200 | 200 | No | -- |
| TPH – diesel range | 7.3 | 200 | 200 | 200 | No | -- |
| 4-4'-DDE | 0.0017 | 2.94 | 0.0257 | 0.0033 [j] | No | -- |
| 4-4'-DDT | 0.0027 | 2.94 | 0.0257 | 0.0033 [j] | No | -- |
| Aroclor-1254 | 0.046 | 0.5 | 0.017 [j] | 0.017 [j] | Yes | Yes [i] |
| Aroclor-1260 | 0.048 | 0.5 | 0.017 [j] | 0.017 [j] | Yes | Yes [i] |
| Acenaphthene | 0.027 | 4,800 | 96 | 129 | No | -- |

**Table 5. Comparison of Contaminant Concentrations to Action Levels for the 100-H-28:2 and 100-H-42 Staging Pile Area Verification Samples. (2 Pages)**

| COPC | Statistical Result [b] (mg/kg) | Remedial Action Goals [a] | | | Do the Results Exceed RAGs? | Do the Results Pass RESRAD Modeling? |
|---|---|---|---|---|---|---|
| | | Direct Exposure | Soil Cleanup Level for Groundwater Protection | Soil Cleanup Level for River Protection | | |
| Anthracene | 0.026 | 24,000 | 240 | 1,920 | No | -- |
| Benzo(a)anthracene | 0.018 | 1.37 | 0.015 [j] | 0.015 [j] | Yes | Yes [i] |
| Benzo(a)pyrene | 0.021 | 0.137 | 0.015 [j] | 0.015 [j] | Yes | Yes [i] |
| Benzo(b)fluoranthene | 0.021 | 1.37 | 0.015 [j] | 0.015 [j] | Yes | Yes [i] |
| Benzo(ghi)perylene [k] | 0.041 | 2,400 | 48 | 192 | No | -- |
| Benzo(k)fluoranthene | 0.019 | 1.37 | 0.015 [j] | 0.015 [j] | Yes | Yes [i] |
| Chrysene | 0.056 | 13.7 | 0.12 | 0.1 [j] | No | -- |
| Dibenz[a,h]anthracene | 0.015 | 1.37 | 0.03 [j] | 0.03 [j] | No | -- |
| Fluoranthene | 0.046 | 3,200 | 64 | 18.0 | No | -- |
| Fluorene | 0.019 | 3,200 | 64 | 260 | No | -- |
| Indeno(1,2,3-cd)pyrene | 0.030 | 1.37 | 0.33 [j] | 0.33 [j] | No | -- |
| Phenanthrene [k] | 0.130 | 24,000 | 240 | 1,920 | No | -- |
| Pyrene | 0.049 | 2,400 | 48 | 192 | No | -- |

[a] Lookup values and remedial action goals obtained from the 100 Area RDR/RAWP (DOE-RL 2009b).

[b] Maximum or 95% UCL result, depending on data censorship, as described in the *100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations* (Attachment C).

[c] No value; because the $K_d$ value for this contaminant is greater than 80 mL/g, RESRAD modeling discussed in Appendix C of the 100 Area RDR/RAWP (DOE-RL 2009b) predicts that the contaminant will show no migration within the 100 Area vadose zone, and no impact on groundwater or the Columbia River.

[d] Hanford Site-specific background value is not available. Value used is from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).

[e] Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d). 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 Area RDR/RAWP (DOE-RL 2009b).

[f] Carcinogenic cleanup level calculated based on the inhalation exposure pathway per WAC 173-340-750(3), (Method B for air quality) and an airborne particulate mass loading rate of 0.0001 g/m$^3$ (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).

[g] No Hanford Site-specific or Washington State background value available.

[h] No parameters (bioconcentration factors or AWQC values) are available from the Cleanup Levels and Risk Calculations Database (Ecology 2015) or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], [Method B for surface waters]).

[i] Based on RESRAD modeling discussed in Appendix C of the 100 Area RDR/RAWP (DOE-RL 2009b), the residual concentrations of lead, aroclor-1254, aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene are not expected to migrate more than 1.8 m (5.9 ft) vertically in 1,000 years (based on the lowest $K_d$ of the contaminants [lead with a $K_d$ of 30 mL/g]). The vadose zone underlying the 100-H-28:2 and 100-H-42 excavations is 2.5 m (8.2 ft) thick.

[j] Where cleanup levels are less than RDLs, cleanup levels default to RDLs per WAC 173-340-707(2).

[k] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals.
Contaminant: benzo(ghi)perylene; surrogate: pyrene
Contaminant: phenanthrene; surrogate: anthracene

-- = not applicable
AWQC = ambient water quality criteria
BG = background
COPC = contaminant of potential concern
DDE = dichlorodiphenyldichloroethylene
DDT = dichlorodiphenyltrichloroethane
$K_d$ = distribution coefficient
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = remedial design report/remedial action work plan
RESRAD = RESidual RADioactivity (dose model)
TPH = total petroleum hydrocarbons
UCL = upper confidence limit
WAC = *Washington Administrative Code*

**Table 6. Comparison of Contaminant Concentrations to Action Levels for the 100-H-28:2 and 100-H-42 Overburden Verification Samples. (2 Pages)**

| COPC | Statistical Result [b] (mg/kg) | Remedial Action Goals [a] | | | Do the Results Exceed RAGs? | Do the Results Pass RESRAD Modeling? |
|---|---|---|---|---|---|---|
| | | Direct Exposure | Soil Cleanup Level for Groundwater Protection | Soil Cleanup Level for River Protection | | |
| Arsenic | 8.6 | 20 [c] | 20 [c] | 20 [c] | No | -- |
| Barium | 55.6 (<BG) | 5,600 | 200 | 400 | No | -- |
| Beryllium | 0.16 (<BG) | 10.4 [d] | 1.51 [c] | 1.51 [c] | No | -- |
| Boron [e] | 1.5 | 7,200 | 320 | -- [f] | No | -- |
| Cadmium [g] | 0.12 (<BG) | 13.9 [d] | 0.81 [c] | 0.81 [c] | No | -- |
| Chromium (total) | 13.7 (<BG) | 80,000 | 18.5 [c] | 18.5 [c] | No | -- |
| Cobalt | 6.3 (<BG) | 24 | 15.7 [c] | -- [f] | No | -- |
| Copper | 16.1 (<BG) | 2,960 | 59.2 | 22.0 [c] | No | -- |
| Hexavalent chromium [e] | 0.365 | 2.1 [d] | 4.8 | 2 | No | -- |
| Lead | 29.1 | 353 | 10.2 [c] | 10.2 [c] | Yes | Yes [h] |
| Manganese | 270 (<BG) | 3,760 | 512 [c] | 512 [c] | No | -- |
| Mercury | 0.0070 (<BG) | 24 | 0.33 [c] | 0.33 [c] | No | -- |
| Nickel | 11.2 (<BG) | 1,600 | 19.1 [c] | 27.4 | No | -- |
| Silver | 0.22 (<BG) | 400 | 8 | 0.73 [c] | No | -- |
| Vanadium | 42.1 (<BG) | 560 | 85.1 [c] | -- [f] | No | -- |
| Zinc | 36.5 (<BG) | 24,000 | 480 | 67.8 [c] | No | -- |
| Chloride | 12.6 (<BG) | -- | 25,000 | -- [f] | No | -- |
| Fluoride | 1.2 (<BG) | 4,800 | 96 | 400 | No | -- |
| Nitrogen in nitrate | 2.6 (<BG) | 128,000 | 1,000 | 2,000 | No | -- |
| Nitrogen in nitrate and nitrite | 1.0 (<BG) | 128,000 | 1,000 | 2,000 | No | -- |
| Nitrogen in nitrite [e] | 1.5 | 8,000 | 100 | 200 | No | -- |
| Sulfate | 20.0 (<BG) | -- | 25,000 | -- [f] | No | -- |
| TPH – diesel range EXT | 4.7 | 200 | 200 | 200 | No | -- |
| TPH – diesel range | 2.7 | 200 | 200 | 200 | No | -- |
| 4-4'-DDE | 0.0010 | 2.94 | 0.0257 | 0.0033 [i] | No | -- |
| Acenaphthene | 0.013 | 4,800 | 96 | 129 | No | -- |
| Benzo(a)anthracene | 0.037 | 1.37 | 0.015 [i] | 0.015 [i] | Yes | Yes [h] |
| Benzo(a)pyrene | 0.033 | 0.137 | 0.015 [i] | 0.015 [i] | Yes | Yes [h] |
| Benzo(b)fluoranthene | 0.032 | 1.37 | 0.015 [i] | 0.015 [i] | Yes | Yes [h] |
| Benzo(k)fluoranthene | 0.013 | 1.37 | 0.015 [i] | 0.015 [i] | No | -- |
| Chrysene | 0.037 | 13.7 | 0.12 | 0.1 [i] | No | -- |
| Fluoranthene | 0.058 | 3,200 | 64 | 18.0 | No | -- |
| Fluorene | 0.028 | 3,200 | 64 | 260 | No | -- |

## Table 6. Comparison of Contaminant Concentrations to Action Levels for the 100-H-28:2 and 100-H-42 Overburden Verification Samples. (2 Pages)

| COPC | Statistical Result [b] (mg/kg) | Remedial Action Goals [a] | | | Do the Results Exceed RAGs? | Do the Results Pass RESRAD Modeling? |
|---|---|---|---|---|---|---|
| | | Direct Exposure | Soil Cleanup Level for Groundwater Protection | Soil Cleanup Level for River Protection | | |
| Phenanthrene [j] | 0.043 | 24,000 | 240 | 1,920 | No | -- |
| Pyrene | 0.068 | 2,400 | 48 | 192 | No | -- |

[a] Remedial action goals obtained from the 100 Area RDR/RAWP (DOE-RL 2009b).
[b] Maximum or 95% UCL result, depending on data censorship, as described in the *100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations* (Attachment C).
[c] Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d). 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 Area RDR/RAWP (DOE-RL 2009b).
[d] Carcinogenic cleanup level calculated based on the inhalation exposure pathway per WAC 173-340-750(3), (Method B for air quality) and an airborne particulate mass loading rate of 0.0001 g/m$^3$ (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).
[e] No Hanford Site-specific or Washington State background value available.
[f] No parameters (bioconcentration factors or AWQC values) are available from the Cleanup Levels and Risk Calculations Database (Ecology 2015) or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], [Method B for surface waters]).
[g] Hanford Site-specific background value is not available. Value used is from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).
[h] Based on RESRAD modeling discussed in Appendix C of the 100 Area RDR/RAWP (DOE-RL 2009b), the residual concentrations of lead, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene are not expected to migrate more than 1.8 m (5.9 ft) vertically in 1,000 years (based on the lowest $K_d$ of the contaminants [lead with a $K_d$ of 30 mL/g]). The vadose zone underlying the 100-H-28:2 and 100-H-42 excavations is 2.5 m (8.2 ft) thick.
[i] Where cleanup levels are less than RDLs, cleanup levels default to RDLs per WAC 173-340-707(2).
[j] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals. Contaminant: phenanthrene; surrogate: anthracene

-- = not applicable
AWQC = ambient water quality criteria
BG = background
COPC = contaminant of potential concern
DDE = dichlorodiphenyldichloroethylene
$K_d$ = distribution coefficient
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = remedial design report/remedial action work plan
RESRAD = RESidual RADioactivity (dose model)
TPH = total petroleum hydrocarbons
UCL = upper confidence limit
WAC = *Washington Administrative Code*

**Table 7. Comparison of Contaminant Concentrations to Action Levels for the 100-H-28:2 and 100-H-42 Focused Verification Samples. (2 Pages)**

| COPC | Maximum Result [b] (pCi/g) | Site Lookup Values [a] | | | Do the Results Exceed RAGs? | Do the Results Pass RESRAD Modeling? |
|---|---|---|---|---|---|---|
| | | Shallow Zone Lookup Value | Groundwater Protection Lookup Value | River Protection Lookup Value | | |
| Nickel-63 | 8.99 | 4,013 | 83 | 166 | No | -- |
| **COPC** | **Maximum Result [b] (mg/kg)** | **Remedial Action Goals [a]** | | | **Do the Results Exceed RAGs?** | **Do the Results Pass RESRAD Modeling?** |
| | | **Direct Exposure** | **Soil Cleanup Level for Groundwater Protection** | **Soil Cleanup Level for River Protection** | | |
| Antimony [c] | 0.40 (<BG) | 32 | 5 [d] | 5 [d] | No | -- |
| Arsenic | 7.3 | 20 [d] | 20 [d] | 20 [d] | No | -- |
| Barium | 88.0 (<BG) | 5,600 | 200 | 400 | No | -- |
| Beryllium | 0.27 (<BG) | 10.4 [e] | 1.51 [d] | 1.51 [d] | No | -- |
| Boron [f] | 3.6 | 7,200 | 320 | -- [g] | No | -- |
| Cadmium [c] | 0.25 (<BG) | 13.9 [e] | 0.81 [d] | 0.81 [d] | No | -- |
| Chromium (total) | 21.2 | 80,000 | 18.5 [d] | 18.5 [d] | Yes | Yes [h] |
| Cobalt | 7.0 (<BG) | 24 | 15.7 [d] | -- [g] | No | -- |
| Copper | 18.7 (<BG) | 2,960 | 59.2 | 22.0 [d] | No | -- |
| Hexavalent chromium [f] | 0.212 | 2.1 [e] | 4.8 | 2 | No | -- |
| Lead | 21.1 | 353 | 10.2 [d] | 10.2 [d] | Yes | Yes [h] |
| Manganese | 313 (<BG) | 3,760 | 512 [d] | 512 [d] | No | -- |
| Mercury | 4.9 | 24 | 0.33 [d] | 0.33 [d] | Yes | Yes [h] |
| Nickel | 17.9 (<BG) | 1,600 | 19.1 [d] | 27.4 | No | -- |
| Vanadium | 37.4 (<BG) | 560 | 85.1 [d] | -- [g] | No | -- |
| Zinc | 50.2 (<BG) | 24,000 | 480 | 67.8 [d] | No | -- |
| Chloride | 12.1 (<BG) | -- | 25,000 | -- [g] | No | -- |
| Fluoride | 1.9 (<BG) | 4,800 | 96 | 400 | No | -- |
| Nitrogen in nitrate | 3.9 (<BG) | 128,000 | 1,000 | 2,000 | No | -- |
| Nitrogen in nitrate and nitrite | 4.6 (<BG) | 128,000 | 1,000 | 2,000 | No | -- |
| Sulfate | 89.6 (<BG) | -- | 25,000 | -- [g] | No | -- |
| TPH – diesel range EXT | 48 | 200 | 200 | 200 | No | -- |
| TPH – diesel range | 21 | 200 | 200 | 200 | No | -- |
| 4-4'-DDE | 0.00026 | 2.94 | 0.0257 | 0.0033 [i] | No | -- |
| 4-4'-DDT | 0.00065 | 2.94 | 0.0257 | 0.0033 [i] | No | -- |
| Aroclor-1254 | 0.010 | 0.5 | 0.017 [i] | 0.017 [i] | No | -- |
| Aroclor-1260 | 0.034 | 0.5 | 0.017 [i] | 0.017 [i] | Yes | Yes [h] |
| Acenaphthene | 0.013 | 4,800 | 96 | 129 | No | -- |
| Benzo(a)anthracene | 0.024 | 1.37 | 0.015 [i] | 0.015 [i] | Yes | Yes [h] |
| Benzo(a)pyrene | 0.027 | 0.137 | 0.015 [i] | 0.015 [i] | Yes | Yes [h] |
| Benzo(b)fluoranthene | 0.026 | 1.37 | 0.015 [i] | 0.015 [i] | Yes | Yes [h] |
| Benzo(ghi)perylene [j] | 0.008 | 2,400 | 48 | 192 | No | -- |

**Table 7. Comparison of Contaminant Concentrations to Action Levels for the 100-H-28:2 and 100-H-42 Focused Verification Samples. (2 Pages)**

| COPC | Maximum Result [b] (mg/kg) | Remedial Action Goals [a] | | | Do the Results Exceed RAGs? | Do the Results Pass RESRAD Modeling? |
|---|---|---|---|---|---|---|
| | | Direct Exposure | Soil Cleanup Level for Groundwater Protection | Soil Cleanup Level for River Protection | | |
| Benzo(k)fluoranthene | 0.010 | 1.37 | 0.015 [i] | 0.015 [i] | No | -- |
| Chrysene | 0.021 | 13.7 | 0.12 | 0.1 [i] | No | -- |
| Dimethyl phthalate | 0.043 | 80,000 | 1,600 | 14,400 | No | -- |
| Fluoranthene | 0.059 | 3,200 | 64 | 18.0 | No | -- |
| Fluorene | 0.012 | 3,200 | 64 | 260 | No | -- |
| Indeno(1,2,3-cd)pyrene | 0.023 | 1.37 | 0.33 [i] | 0.33 [i] | No | -- |
| Phenanthrene [j] | 0.048 | 24,000 | 240 | 1,920 | No | -- |
| Pyrene | 0.059 | 2,400 | 48 | 192 | No | -- |

[a] Lookup values and remedial action goals obtained from the 100 Area RDR/RAWP (DOE-RL 2009b).
[b] Maximum result, as described in the *100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations* (Attachment C).
[c] Hanford Site-specific background value is not available. Value used is from *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).
[d] Where cleanup levels are less than background, cleanup levels default to background per WAC 173-340-700(4)(d). 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 Area RDR/RAWP (DOE-RL 2009b).
[e] Carcinogenic cleanup level calculated based on the inhalation exposure pathway per WAC 173-340-750(3), (Method B for air quality) and an airborne particulate mass loading rate of 0.0001 g/m$^3$ (*Hanford Guidance for Radiological Cleanup* [WDOH 1997]).
[f] No Hanford Site-specific or Washington State background value available.
[g] No parameters (bioconcentration factors or AWQC values) are available from the Cleanup Levels and Risk Calculations Database (Ecology 2015) or other databases to calculate cleanup levels (WAC 173-340-730[3][a][iii], [Method B for surface waters]).
[h] Based on RESRAD modeling discussed in Appendix C of the 100 Area RDR/RAWP (DOE-RL 2009b), the residual concentrations of chromium (total), lead, mercury, aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene are not expected to migrate more than 1.8 m (5.9 ft) vertically in 1,000 years (based on the lowest $K_d$ of the contaminants [lead and mercury with a $K_d$ of 30 mL/g]). The vadose zone underlying the 100-H-28:2 and 100-H-42 excavations is 2.5 m (8.2 ft) thick.
[i] Where cleanup levels are less than RDLs, cleanup levels default to RDLs per WAC 173-340-707(2).
[j] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals. Contaminant – benzo(ghi)perylene: surrogate: pyrene, Contaminant: phenanthrene; surrogate: anthracene

-- = not applicable
AWQC = ambient water quality criteria
BG = background
COPC = contaminant of potential concern
DDE = dichlorodiphenyldichloroethylene
DDT = dichlorodiphenyltrichloroethane
$K_d$ = distribution coefficient
RAG = remedial action goal
RDL = required detection limit
RDR/RAWP = remedial design report/remedial action work plan
RESRAD = RESidual RADioactivity (dose model)
TPH = total petroleum hydrocarbons
WAC = *Washington Administrative Code*

The complete laboratory results for all constituents are stored in a Washington Closure Hanford project-specific database prior to archival in the Hanford Environmental Information System and are presented in Attachment 1 of the *100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculation* (Appendix C).

## DATA EVALUATION

This section demonstrates that contaminant concentrations at the 100-H-28:2 subsite, 100-H-42 waste site, and the associated overburden piles and waste SPAs achieve the applicable RAGs developed to support unrestricted land use at the 100 Area as established in the Remaining Sites ROD (EPA 1999) and documented in the 100 Area RDR/RAWP (DOE-RL 2009b).

### Attainment of Radionuclide Direct Exposure RAGs

Evaluation of RAG attainment for radionuclides was performed using the single radionuclide dose equivalence lookup values. The model used to develop these dose equivalence lookup values is presented in the 100 Area RDR/RAWP (DOE-RL 2009b). A comparison of the radionuclide verification sample results for the statistical data set to the cumulative direct exposure radiological dose limit of 15 mrem/yr was conducted using sum of fractions calculations (Appendix C). The sum of fractions were conservatively calculated for the 100-H-28:2 subsite, 100-H-42 waste site, and the associated overburden soil stockpiles and waste SPAs decision units using the greater of the statistical or maximum value for each COPC.

The sum of fractions shown in the *100-H-28:2 and 100-H-42 Waste Sites Direct Contact Hazard Quotient, Carcinogenic Risk, and Sum of Fractions Calculations* (Appendix C) determined that the maximum predicted total radiological dose is 0.660 mrem/yr. Comparing this to the dose limit of <15 mrem/yr, the requirement is met.

### Attainment of Nonradionuclide RAGs

Tables 3 through 7 compares the cleanup verification sample values for the 100-H-28:2 subsite, 100-H-42 waste site, the waste SPAs, and the overburden stockpiles decision units 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 chromium (total), lead, mercury, aroclor-1254, aroclor-1260, 4,4'-DDE, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene. However, based on the contaminant with the lowest distribution coefficient ($K_d$) (lead and mercury with a $K_d$ of 30 mL/g), these contaminants are not expected to migrate more than 1.8 m (5.9 ft) vertically in 1,000 years based on RESidual RADioactivity (RESRAD) modeling discussed in Appendix C of the 100 Area RDR/RAWP (DOE-RL 2009b). The vadose zone beneath the 100-H-28:2 and 100-H-42 excavation is approximately 2.5 m (8.2 ft) thick. Therefore, the residual concentrations of chromium (total), lead, mercury, aroclor-1254, aroclor-1260, 4,4'-dichlorodiphenyldichloroethylene (DDE), benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene are predicted to be protective of groundwater and the Columbia River.

### Three-Part Test for Nonradionuclides

A RAG requirement for nonradionuclides is the WAC 173-340-740(7)(e) three-part test, which consists of the following criteria: (1) the cleanup verification 95% upper confidence limit (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-H-28:2 subsite, the 100-H-42 waste site, and the associated overburden stockpiles and waste SPAs is included in the *100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculation* in Appendix C of this remaining sites verification package, where half or more of the data set were detected.

The results of this evaluation indicate that residual COPC concentrations at the 100-H-28:2 subsite, 100-H-42 waste site, and associated overburden soil stockpiles and waste SPAs decision units pass the three-part test in comparison against applicable RAGs with the exception of lead, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene, which fails one or more parts of the three-part test to be protective of groundwater and the Columbia River. However, based on RESRAD modeling discussed in Appendix C of the 100 Area RDR/RAWP (DOE-RL 2009b), the residual concentrations of these contaminants are not predicted to migrate more than 1.8 m (5.9 ft) vertically within 1,000 years (based on the lowest $K_d$ of the contaminants [lead with a $K_d$ of 30 mL/g]). The vadose zone beneath the 100-H-28:2 and 100-H-42 excavation is approximately 2.5 m (8.2 ft) thick; therefore, the residual concentrations of lead, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene are predicted to be protective of groundwater and the Columbia River. Arsenic also failed the three-part test because two sample locations within the waste SPA exceeded the direct exposure RAG of 20 mg/kg. However, the location of the SPA is in a known orchard area; therefore, as agreed by the Tri-Parties in TPA-CN-401 (DOE-RL 2010) and an email agreement with the Washington State Department of Ecology and the U.S. Department of Energy, Richland Operations Office (WCH 2015c), residual arsenic contamination that resulted from pesticide use prior to the Manhattan Project are excluded from further evaluation. Arsenic results are provided in the *100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculation* in Appendix C of this remaining sites verification package and the 95% UCL values for each decision unit are provided in Tables 3 through 7.

An additional application of the three-part test is included for the statistical data sets that default to the maximum value 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 with the exception of aroclor-1254, aroclor-1260, 4-4'-DDE, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene, which fails one or more parts of the three-part test. However, based on RESRAD modeling, the residual concentrations of these contaminants are predicted to migrate less than 1 m (3.3 ft) vertically within 1,000 years (based on the lowest $K_d$ of the contaminants [aroclor-1254 with a $K_d$ of 75.6 mL/g]). The vadose zone beneath the 100-H-28:2 and 100-H-42 excavation is approximately 2.5 m (8.2 ft) thick; therefore, the residual concentrations of aroclor-1254, aroclor-1260, 4-4'-DDE, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene are predicted to be protective of groundwater and the Columbia River.

**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 x $10^{-6}$, and a cumulative carcinogenic risk of less than 1 x $10^{-5}$. For the 100-H-28:2 subsite, the 100-H-42 waste site, and the associated overburden stockpile and waste SPAs, 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 levels. All individual hazard quotients for noncarcinogenic constituents were less than 1.0. The cumulative hazard quotient for those noncarcinogenic constituents above background or detected levels is 2.4 x $10^{-1}$, which is less than 1.0. The individual carcinogenic risk values for the carcinogenic constituents detected above background are less than 1 x $10^{-6}$, and the cumulative carcinogenic risk value is 9.0 x $10^{-7}$, which is less than 1 x $10^{-5}$. The 100-H-28:2 subsite, the 100-H-42 waste site, and the associated overburden stockpiles and waste SPAs meets the requirements for the direct contact hazard quotient and excess carcinogenic risk as identified in the 100 Area RDR/RAWP (DOE-RL 2009b).

**Nonradionuclide Groundwater Hazard Quotient and Carcinogenic Risk RAGs Attained**

Assessment of the risk requirements for the 100-H-28:2 subsite, 100-H-42 waste site, and the associated overburden soil stockpiles and waste SPAs decision units 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 x $10^{-6}$, and a cumulative excess carcinogenic risk of less than 1 x $10^{-5}$. 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 Area RDR/RAWP (DOE-RL 2009b). Based on this model and a vadose zone of approximately 2.5 m (8.2 ft) in thickness, a $K_d$ of 23.5 mL/g or greater is required to show no predicted migration to groundwater in 1,000 years.

The hazard quotient for individual nonradionuclides for the 100-H-28:2 and 100-H-42 excavations and the associated overburden soil stockpiles and waste SPAs decision units are less than 1. The cumulative hazard quotient, 2.1 x $10^{-1}$, is less than 1. The individual excess carcinogenic risk values are less than 1 x $10^{-6}$, and the cumulative carcinogenic risk, 9.3 x $10^{-8}$, is less than 1 x $10^{-5}$. Therefore, the 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 2014c), the field logbooks (WCH 2013, 2014b, 2015b), and resulting analytical data with the sampling and data quality requirements specified by the project objectives and performance specifications.

The DQA for the 100-H-28:2 subsite, the 100-H-42 waste site, and the associated overburden soil stockpiles and waste SPAs 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 a Washington Closure Hanford project-specific database for data evaluation prior to archival in the Hanford Environmental Information System and are summarized in Appendix C. The detailed DQA is presented in Appendix D.

## SUMMARY FOR INTERIM CLOSURE

The 100-H-28:2 subsite, the 100-H-42 waste site, and the associated overburden soil stockpiles and waste SPAs have been evaluated in accordance with the Remaining Sites ROD (EPA 1999) and the 100 Area RDR/RAWP (DOE-RL 2009b). Verification sampling was performed and the analytical results indicate that the residual concentrations of COPCs at the site meet the remedial action objectives for direct exposure, groundwater protection, and river protection.

In accordance with this evaluation, the verification sampling results support a reclassification of the 100-H-28:2 subsite and the 100-H-42 waste site to Interim Closed Out. Although the maximum depth of the excavation extended into the deep zone (i.e., greater than 4.6 m [15 ft] bgs), the entire sites were closed out using the more restrictive shallow zone requirements. Contamination above direct exposure levels was not observed in the verification soil samples collected from the excavations; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone of the sites are not required.

## REFERENCES

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

BHI, 2000, *Cleanup Verification Package for the 100-H-21 Reactor Effluent Pipelines, 100-H-22 Effluent Pipeline Leakage, and 100-H-1 Rod Cave*, CVP-2000-00029, Rev. 0, Bechtel Hanford Inc., Richland, Washington.

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# APPENDIX A

# ECOLOGICAL RISK COMPARISON TABLE

**Table A-1. Maximum Contaminant Concentrations that Exceed Ecological Screening Levels for the 100-H-28:2 Subsite and 100-H-42 Waste Site [a].**

| Hazardous Substance | | 2007 WAC 173-340 Table 749-3 | | | EPA Ecological Soil Screening Levels [b] | | | | Waste Site Analyses |
|---|---|---|---|---|---|---|---|---|---|
| | | Plants | Soil Biota | Wildlife | Plants | Soil Biota | Avian [c] | Mammalian [c] | |
| | BG | | | | | | | | |
| Antimony | 5 | 5 | -- | -- | -- | 78 | -- | 0.27 | 0.51 (<BG) |
| Arsenic | 6.5 [d] | 10 | 60 | 132 | 18 | -- | 43 | 46 | 15.2 |
| Boron | -- | 0.5 | -- | -- | -- | -- | -- | -- | 25.7 |
| Lead | 10.2 | 50 | 500 | 118 | 120 | 1,700 | 11 | 56 | 65.0 |
| Manganese | 512 | 1,100 [e] | -- | 1,500 | 220 | 450 | 4,300 | 4,000 | 313 (<BG) |
| Mercury | 0.33 | 0.3 | 0.1 | 5.5 | -- | -- | -- | -- | 4.9 |
| Vanadium | 85.1 | 2 | -- | -- | -- | -- | 7.8 | 280 | 47.0 (<BG) |
| Zinc | 67.8 | 86 [e] | 200 | 360 | 160 | 120 | 46 | 79 | 50.2 (<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] The Hanford Site background for arsenic is 6.5 mg/kg. An 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 *Remedial Design Report/Remedial Action Work Plan for the 100 Area*, DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

[e] 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.

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

# APPENDIX B

# CONFIRMATORY SAMPLE SUMMARY TABLE, CONFIRMATORY SAMPLING RESULTS, IN-PROCESS SAMPLE SUMMARY TABLE, AND IN-PROCESS SAMPLING RESULTS

**Table B-1. 100-H-28:2 Confirmatory Sample Summary Table. (2 Pages)**

| Test Pit | Sample Location | Sample Media | Sample Number | Coordinate Locations | Depth | Sample Analysis |
|---|---|---|---|---|---|---|
| 1 | Unlabeled manhole southeast of 190-H | Manhole contents | J17KK2 | N 152623 E 577894 | 6.1 m bgs | ICP metals [a], mercury, GEA, gross alpha, gross beta, carbon-14, nickel-63, tritium, KPA, PCB, pesticides, SVOA, IC anions, and TPH |
| | | | J17KK7 | | | Hexavalent chromium |
| | | Soils underlying pipe | J17KL2 | | | ICP metals [a], mercury, hexavalent chromium, GEA, gross alpha, gross beta, carbon-14, nickel-63, tritium KPA, PCB, pesticides, SVOA, IC anions, and TPH |
| | | Contents of discovered french drain | J16VH0 | | 1.0 m bgs | ICP metals [a], mercury, GEA, gross alpha, gross beta, KPA, PCB, PAH, IC anions, and TPH |
| | | | J16VJ1 | | | Hexavalent chromium |
| | | Soil underlying discovered french drain | J178R0 | | 1.2 m bgs | ICP metals [a], mercury, hexavalent chromium, GEA, gross alpha, gross beta, , KPA, PCB, PAH, IC anions, and TPH |
| 2 | Manhole H-5 | Soils at pipe-vault junction | J17KL4 | N 152707 E 577815 | 9.1 m bgs | ICP metals [a], mercury, hexavalent chromium, GEA, gross alpha, gross beta, carbon-14, nickel-63, tritium, KPA, PCB, SVOA, IC anions, and TPH |
| | | Copper wire with fabric wrap | J17R70 | | Surface | Asbestos |
| 4 | Manhole H-2 | Soils from within and around discovered french drain | J17W36 | N 152707 E 577952 | Surface | ICP metals [a], mercury, hexavalent chromium, GEA, gross alpha, gross beta, KPA, PCB, SVOA, IC anions, and TPH |
| | | Stained soils underlying 100-H-4 pipeline | J17YR9 | | 4.6 m bgs | ICP metals [a], mercury, hexavalent chromium, GEA, gross alpha, gross beta, KPA, PCB, SVOA, VOA, IC anions, and TPH |
| | | 10-in. cast iron fire loop pipe joint fibrous material | J17FR0 | | 1.5 m bgs | Asbestos |

**Table B-1. 100-H-28:2 Confirmatory Sample Summary Table. (2 Pages)**

| Test Pit | Sample Location | Sample Media | Sample Number | Coordinate Locations | Depth | Sample Analysis |
|---|---|---|---|---|---|---|
| 6 | Manhole | Manhole contents (wet, muddy, sand and gravel) | J16WB9 | N 152556<br>E 577738 | 2.4 m bgs | ICP metals [a], mercury, GEA, gross alpha, gross beta, carbon-14, nickel-63, KPA, PCB, SVOA, IC anions, and TPH |
| | | | J16WC1 | | 2.4 m bgs | Hexavalent chromium |

[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, silver, selenium, vanadium, and zinc in the analytical results package.

bgs = below ground surface
GEA = gamma energy analysis
IC = ion chromatography
ICP = inductively coupled plasma
KPA = kinetic phosphorescence analysis
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
SVOA = semivolatile organic analysis
TPH = total petroleum hydrocarbon
VOA = volatile organic analysis

## Table B-2. 100-H-28:2 Confirmatory Sample Results. (11 Pages).

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Bromide | | | Chloride | | | Fluoride | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 2.5 | U | 2.5 | 5.5 | | 2.5 | 2.5 | U | 2.5 |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 2.3 | U | 2.3 | 2.3 | U | 2.3 | 2.3 | U | 2.3 |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 2.5 | U | 2.5 | 2.5 | U | 2.5 | 2.5 | U | 2.5 |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 2.5 | U | 2.5 | 20.1 | | 2.5 | 2.5 | U | 2.5 |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 2.8 | U | 2.8 | 5.1 | | 2.8 | 2.8 | U | 2.8 |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 2.4 | U | 2.4 | 5.8 | | 1.9 | 2.4 | U | 2.4 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | | | | | | | | | |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | | | | | | | | | |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Nitrate | | | Nitrite | | | Nitrogen in Nitrate | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 164 | | 2.51 | 2.51 | U | 2.51 | | | |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 7.56 | | 2.32 | 2.32 | U | 2.32 | 1 | | 0.2 |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 3.78 | | 2.54 | 2.54 | U | 2.54 | 0.46 | | 0.16 |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 24.5 | | 2.49 | 2.49 | U | 2.49 | | | |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 3.29 | | 2.81 | 2.81 | U | 2.81 | | | |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 5.81 | | 2.38 | 2.38 | U | 2.38 | | | |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | | | | | | | | | |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | | | | | | | | | |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Nitrogen in Nitrite | | | Phosphate | | | Sulfate | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | | | | 10.5 | | 2.5 | 54.5 | | 2.5 |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 0.2 | U | 0.2 | 2.3 | U | 2.3 | 6.5 | | 2.3 |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 0.16 | U | 0.16 | 4.9 | | 2.5 | 2.5 | U | 2.5 |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | | | | 5.4 | | 2.5 | 85.3 | | 2.5 |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | | | | 2.8 | U | 2.8 | 37.6 | | 2.8 |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | | | | 2.4 | U | 2.4 | 22.9 | | 2.4 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | | | | | | | | | |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | | | | | | | | | |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | TPH - Diesel | | | TPH - Motor Oil | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 333000 | UD | | 560000 | JD | |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 8600 | | | 22000 | | |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 22000 | | | 59000 | | |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 51000 | | | 100000 | | |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 3890 | U | | 11700 | U | |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 2700 | J | | 3400 | J | |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | 2700 | JB | | 6100 | JB | |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 3450 | U | | 12000 | B | |

## Table B-2. 100-H-28:2 Confirmatory Sample Results. (11 Pages).

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Aluminum | | | Antimony | | | Arsenic | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 3790 | | 9.8 | 2.3 | | 0.73 | 10.3 | | 1.2 |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 9880 | C | 8.1 | 0.41 | U | 0.41 | 2.5 | | 0.68 |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 7770 | C | 8.1 | 0.4 | U | 0.4 | 3.1 | | 0.67 |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 9050 | | 2.6 | 5.0 | | 0.19 | 31.1 | | 0.32 |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 10800 | | 3 | 0.49 | | 0.22 | 5.5 | | 0.37 |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 6100 | | 3.3 | 0.25 | U | 0.25 | 3 | | 0.42 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | 7660 | | 3.4 | 0.33 | | 0.26 | 7.5 | | 1.3 |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 9000 | | 15.7 | 1.2 | U | 1.2 | 8.1 | | 1.6 |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Barium | | | Beryllium | | | Boron | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 143 | | 0.24 | 0.16 | | 0.12 | 7.5 | | 1.2 |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 147 | C | 0.14 | 0.44 | | 0.1 | 1.7 | | 0.68 |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 80.3 | C | 0.13 | 0.41 | | 0.1 | 1.9 | | 0.67 |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 72.6 | | 0.06 | 0.2 | | 0.03 | 6 | | 0.32 |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 94.8 | | 0.07 | 0.36 | | 0.04 | 1.9 | | 0.37 |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 61.3 | C | 0.08 | 0.14 | | 0.04 | 1.3 | | 0.42 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | 68.9 | | 0.26 | 0.41 | | 0.13 | 1.4 | | 0.43 |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 67.7 | | 0.4 | 0.03 | | 0.2 | 1.3 | | 1.6 |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Cadmium | | | Calcium | | | Chromium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 7.1 | | 0.12 | 8730 | C | 9.8 | 34.8 | | 0.49 |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 0.52 | | 0.07 | 3030 | C | 8.1 | 15.4 | | 0.27 |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 0.07 | U | 0.07 | 3860 | C | 8.1 | 13.4 | | 0.27 |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 1.6 | | 0.03 | 36300 | C | 7.8 | 37.1 | | 0.13 |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 0.05 | | 0.04 | 9410 | C | 8.9 | 24.8 | | 0.15 |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 0.04 | U | 0.04 | 6400 | C | 3.3 | 10.8 | | 0.17 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | 0.13 | U | 0.13 | 3700 | | 3.4 | 13.9 | | 0.51 |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 0.02 | | 0.4 | 4340 | | 15.7 | 14 | | 0.8 |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Cobalt | | | Copper | | | Hexavalent | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 5.7 | | 0.49 | 161 | | 0.49 | | | |
| 100-H-28:2 | J16WC1 | 6/4/08 | TP-6 | 152556 | 577738 | | | | | | | 0.35 | U | 0.35 |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 7.5 | | 0.27 | 18.9 | | 0.27 | | | |
| 100-H-28:2 | J16VJ1 | 10/6/08 | TP-1 | 152623 | 577894 | | | | | | | 0.85 | | 0.35 |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 7.4 | | 0.27 | 15.2 | | 0.27 | 0.21 | U | 0.21 |
| 100-H-28:2 | J17KK7 | 10/15/08 | TP-1 | 152623 | 577894 | | | | | | | 2.46 | | 0.35 |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 7.1 | | 0.13 | 85.8 | C | 0.13 | | | |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 7.8 | | 0.15 | 18.8 | C | 0.15 | 0.23 | U | 0.23 |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 5.7 | | 0.17 | 16.6 | C | 0.17 | 0.2 | U | 0.2 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | 7 | | 0.51 | 14.2 | | 0.51 | 1.1 | UD | 1.1 |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 7.1 | | 0.8 | 16.6 | | 0.8 | 0.21 | U | 0.21 |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Iron | | | Lead | | | Magnesium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 27900 | | 11 | 891 | | 0.73 | 2180 | | 6.1 |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 20600 | C | 9.1 | 39.4 | | 0.41 | 4600 | C | 7.5 |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 20200 | C | 9.1 | 21.1 | | 0.4 | 4290 | C | 7.5 |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 18300 | C | 2.9 | 94.8 | | 0.19 | 8780 | | 1.6 |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 22300 | C | 3.3 | 7.2 | | 0.22 | 7330 | | 1.9 |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 15600 | C | 3.8 | 4.3 | C | 0.25 | 4630 | | 2.1 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | 18400 | | 3.9 | 44.7 | | 0.77 | 4520 | | 3.2 |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 21000 | | 15.7 | 50.8 | | 1.2 | 4800 | | 7.8 |

## Table B-2. 100-H-28:2 Confirmatory Sample Results. (11 Pages).

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Manganese | | | Mercury | | | Molybdenum | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 249 | | 0.1 | 6.1 | | 0.1 | 6 | | 0.73 |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 416 | C | 0.05 | 0.02 | | 0.01 | 0.52 | | 0.41 |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 304 | C | 0.05 | 0.03 | | 0.01 | 0.8 | | 0.4 |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 273 | C | 0.03 | 4.2 | | 0.09 | 0.82 | | 0.19 |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 332 | C | 0.03 | 0.01 | | 0.01 | 0.47 | | 0.22 |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 318 | C | 0.03 | 0.01 | U | 0.01 | 0.25 | U | 0.25 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | 3.8 | | 0.1 | 0.02 | | 0.01 | 0.77 | U | 0.77 |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 324 | | 0.2 | 0.0122 | | 0.03 | 0.4 | | 0.8 |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Nickel | | | Potassium | | | Selenium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 20.7 | | 0.49 | 714 | | 40 | 1.5 | U | 1.5 |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 13.1 | | 0.27 | 756 | | 99.9 | 0.81 | U | 0.81 |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 13.2 | | 0.27 | 700 | | 99.5 | 0.81 | U | 0.81 |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 19.5 | C | 0.13 | 1600 | | 2.6 | 0.39 | U | 0.39 |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 20.1 | C | 0.15 | 1690 | | 3 | 0.45 | U | 0.45 |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 10.7 | | 0.17 | 594 | | 41.2 | 0.5 | U | 0.5 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | 13.9 | | 0.51 | 1060 | | 42.2 | 0.51 | U | 0.51 |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 13.1 | | 0.8 | 1350 | | 15.7 | 1.6 | U | 0.4 |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Silicon | | | Silver | | | Sodium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 360 | | 9.8 | 2.3 | | 0.24 | 348 | C | 1.6 |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 127 | | 13.5 | 0.14 | U | 0.14 | 114 | C | 4.1 |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 131 | | 13.5 | 0.13 | U | 0.13 | 181 | C | 4 |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 283 | | 2.6 | 0.06 | U | 0.06 | 2740 | C | 3.9 |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 253 | | 3 | 0.07 | U | 0.07 | 311 | C | 4.5 |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 327 | | 3.3 | 0.08 | U | 0.08 | 135 | C | 1.7 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | 205 | | 5.7 | 0.26 | U | 0.26 | 157 | | 1.7 |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 713 | | 15.7 | 0.4 | U | 0.4 | 248 | | 7.8 |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Vanadium | | | Zinc | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 20.1 | | 0.34 | 918 | | 1.5 |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 39 | | 0.19 | 61.3 | | 0.81 |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 49.8 | | 0.19 | 49.6 | | 0.81 |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 32 | | 0.09 | 310 | | 0.39 |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 43 | | 0.1 | 52.6 | | 0.45 |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 39.2 | | 0.12 | 31.4 | | 0.5 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | 44 | | 0.36 | 44.4 | | 1.5 |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 51.6 | | 0.4 | 47.9 | | 1.6 |

## Table B-2. 100-H-28:2 Confirmatory Sample Results. (11 Pages).

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | 1,4-Dichlorobenzene | | | 2,4,5-Trichlorophenol | | | 2,4,6-Trichlorophenol | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | TCLP | | | TCLP | | | TCLP | | |
| | | | | | | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 0.05 | U | | 0.12 | U | | 0.05 | U | |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | 2,4-Dinitrotoluene | | | 2-Methylphenol (cresol, o-) | | | 3+4 Methylphenol (cresol, m+p) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | TCLP | | | TCLP | | | TCLP | | |
| | | | | | | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 0.05 | U | | 0.05 | U | | 0.05 | U | |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Hexachlorobenzene | | | Hexachlorobutadiene | | | Hexachloroethane | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | TCLP | | | TCLP | | | TCLP | | |
| | | | | | | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 0.05 | U | | 0.05 | U | | 0.05 | U | |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Nitrobenzene | | | Pentachlorophenol | | | Pyridine | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | TCLP | | | TCLP | | | TCLP | | |
| | | | | | | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 0.05 | U | | 0.12 | U | | 0.05 | U | |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Arsenic | | | Barium | | | Cadmium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | TCLP | | | TCLP | | | TCLP | | |
| | | | | | | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 0.03 | U | 0.03 | 0.272 | 0 | 0.006 | 0.003 | U | 0.003 |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Chromium | | | Lead | | | Mercury | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | TCLP | | | TCLP | | | TCLP | | |
| | | | | | | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 0.012 | U | 0.012 | 0.018 | U | 0.018 | 6E-05 | U | 6E-05 |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Selenium | | | Silver | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | TCLP | | | TCLP | | |
| | | | | | | mg/L | Q | PQL | mg/L | Q | PQL |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 0.036 | U | 0.036 | 0.006 | U | 0.006 |

## Table B-2. 100-H-28:2 Confirmatory Sample Results. (11 Pages).

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Americium-241 | | | Antimony-125 | | | Barium-133 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | GEA | | | GEA | | | GEA | | |
| | | | | | | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 0.691 | | 0.407 | | | | | | |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 0.056 | U | 0.056 | | | | | | |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 0.047 | U | 0.047 | | | | | | |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 0.014 | U | 0.014 | | | | | | |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 0.12 | U | 0.12 | | | | | | |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 0.024 | U | 0.024 | | | | 0.02 | U | 0.02 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | 0.13 | U | 0.13 | 0.045 | U | 0.045 | 0.027 | U | 0.027 |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 0.101 | U | 0.101 | | | | | | |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Carbon-14 | | | Cesium-137 | | | Cobalt-60 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | LSC | | | GEA | | | GEA | | |
| | | | | | | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 34.9 | | 3.69 | 40.5 | | 0.075 | 0.12 | | 0.037 |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | | | | 0.04 | | 0.019 | 0.017 | U | 0.017 |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | | | | 0.056 | | 0.029 | 0.029 | U | 0.029 |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 0.945 | U | 3.99 | 0.596 | | 0.007 | 0.017 | U | 0.017 |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | -1.53 | U | 2.95 | 0.014 | U | 0.014 | 0.015 | U | 0.015 |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | -0.554 | U | 3.08 | 0.016 | U | 0.016 | 0.018 | U | 0.018 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | | | | 0.019 | U | 0.019 | 0.02 | U | 0.02 |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | | | | 0.017 | U | 0.017 | 0.016 | U | 0.016 |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Europium-152 | | | Europium-154 | | | Europium-155 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | GEA | | | GEA | | | GEA | | |
| | | | | | | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 0.25 | U | 0.25 | 0.104 | U | 0.104 | 0.174 | U | 0.174 |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 0.046 | U | 0.046 | 0.048 | U | 0.048 | 0.071 | U | 0.071 |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 0.068 | U | 0.068 | 0.086 | U | 0.086 | 0.084 | U | 0.084 |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 0.049 | U | 0.049 | 0.029 | U | 0.029 | 0.035 | U | 0.035 |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 0.036 | U | 0.036 | 0.052 | U | 0.052 | 0.069 | U | 0.069 |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 0.047 | U | 0.047 | 0.061 | U | 0.061 | 0.043 | U | 0.043 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | 0.05 | U | 0.05 | 0.066 | U | 0.066 | 0.059 | U | 0.059 |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 0.055 | U | 0.055 | 0.057 | U | 0.057 | 0.078 | U | 0.078 |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Nickel-63 | | | Niobium-94 | | | Potassium-40 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | LSC | | | GEA | | | GEA | | |
| | | | | | | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 2.86 | U | 3.21 | | | | 5.74 | | 0.304 |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | | | | | | | 9.99 | | 0.173 |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | | | | | | | 13.8 | | 0.261 |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 0.356 | U | 2.81 | | | | 9.34 | | 0.083 |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | -1.07 | U | 2.71 | | | | 16.7 | | 0.16 |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | -0.273 | U | 2.29 | | | | 12 | | 0.171 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | | | | 0.016 | U | 0.016 | 13.6 | | 0.2 |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | | | | | | | 14.3 | | 0.173 |

## Table B-2. 100-H-28:2 Confirmatory Sample Results. (11 Pages).

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Radium-226 | | | Radium-228 | | | Silver-108m | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | GEA | | | GEA | | | GEA | | |
| | | | | | | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 0.407 | | 0.135 | 0.301 | | 0.15 | | | |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 0.409 | | 0.035 | 0.582 | | 0.077 | | | |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 0.472 | | 0.051 | 0.792 | | 0.116 | | | |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 0.432 | | 0.017 | 0.469 | | 0.033 | | | |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 0.758 | | 0.031 | 1.05 | | 0.063 | | | |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 0.336 | | 0.032 | 0.434 | | 0.074 | 0.013 | U | 0.013 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | 0.537 | | 0.036 | 0.832 | | 0.079 | | | |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 0.559 | | 0.04 | 0.855 | | 0.077 | | | |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Thorium-228 | | | Thorium-232 | | | Tritium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | GEA | | | GEA | | | LSC | | |
| | | | | | | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 0.228 | | 0.125 | 0.301 | | 0.15 | | | |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 0.566 | | 0.026 | 0.582 | | 0.077 | | | |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 0.774 | | 0.034 | 0.792 | | 0.116 | | | |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 0.429 | | 0.009 | 0.469 | | 0.033 | 1.07 | U | 4.97 |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 1.03 | | 0.018 | 1.05 | | 0.063 | 1.03 | U | 4.33 |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 0.477 | | 0.024 | 0.434 | | 0.074 | 0.199 | U | 4.4 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | 0.822 | | 0.026 | 0.832 | | 0.079 | | | |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 0.834 | | 0.03 | 0.855 | | 0.077 | | | |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Uranium-235 | | | Uranium-238 | | | Uranium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | GEA | | | GEA | | | KPA | | |
| | | | | | | pCi/g | Q | MDA | pCi/g | Q | MDA | ug/g | Q | MDA |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 0.286 | U | 0.286 | 4.2 | U | 4.2 | 1.39 | | 0.008 |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 0.08 | U | 0.08 | 1.84 | U | 1.84 | | | |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 0.115 | U | 0.115 | 3.53 | U | 3.53 | | | |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 0.061 | U | 0.061 | 1.81 | U | 1.81 | 0.898 | | 0.017 |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 0.092 | U | 0.092 | 1.76 | U | 1.76 | 1.27 | | 0.017 |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 0.071 | U | 0.071 | 2.21 | U | 2.21 | 1.51 | | 0.013 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | 0.098 | U | 0.098 | 2.19 | U | 2.19 | | | |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 0.103 | U | 0.103 | 2.29 | U | 2.29 | | | |

| Site Code | Sample Number | Sample Date | Sample Location | Northing | Easting | Gross alpha | | | Gross beta | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | GPC | | | GPC | | |
| | | | | | | pCi/g | Q | MDA | pCi/g | Q | MDA |
| 100-H-28:2 | J16WB9 | 6/4/08 | TP-6 | 152556 | 577738 | 4.58 | U | 5.15 | 56.1 | | 5.45 |
| 100-H-28:2 | J16VH0 | 10/6/08 | TP-1 | 152623 | 577894 | 15.2 | | 9.97 | 20.2 | | 8.93 |
| 100-H-28:2 | J178R0 | 10/6/08 | TP-1 | 152623 | 577894 | 15.9 | | 7.78 | 16 | | 5.6 |
| 100-H-28:2 | J17KK2 | 10/15/08 | TP-1 | 152623 | 577894 | 14.5 | | 7.13 | 12.6 | | 8.76 |
| 100-H-28:2 | J17KL2 | 10/15/08 | TP-1 | 152623 | 577894 | 11 | | 7.3 | 22.8 | | 8.78 |
| 100-H-28:2 | J17KL4 | 10/22/08 | TP-2 | 152707 | 577815 | 12.8 | | 6.64 | 20.5 | | 7 |
| 100-H-28:2 | J17W36 | 11/10/08 | TP-4 | 152707 | 577952 | 3.9 | U | 9.82 | 20.7 | | 5.44 |
| 100-H-28:2 | J17YR9 | 12/2/08 | TP-4 | 152707 | 577952 | 12.8 | | 4.64 | 19.3 | | 2.71 |

## Table B-2. 100-H-28:2 Confirmatory Sample Results. (11 Pages).

| Sample Number | | J16VH0 | | | J16WB9 | | | J178R0 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Location | | 100-H-28:2 | | | 100-H-28:2 | | | 100-H-28:2 | | |
| Constituent | Class | 10/06/08 08:15 AM | | | 06/04/08 10:30 AM | | | 10/06/08 09:00 AM | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Acenaphthene | PAH | 350 | D | 66.7 | | | | 70 | UD | 70 |
| Acenaphthylene | PAH | 66.7 | UD | 66.7 | | | | 70 | UD | 70 |
| Anthracene | PAH | 6.67 | UD | 6.67 | | | | 7 | UD | 7 |
| Benzo(a)anthracene | PAH | 150 | D | 6.67 | | | | 300 | D | 7 |
| Benzo(a)pyrene | PAH | 320 | D | 6.67 | | | | 370 | D | 7 |
| Benzo(b)fluoranthene | PAH | 770 | D | 6.67 | | | | 650 | D | 7 |
| Benzo(ghi)perylene | PAH | 370 | D | 6.67 | | | | 270 | D | 7 |
| Benzo(k)fluoranthene | PAH | 180 | D | 6.67 | | | | 210 | D | 7 |
| Chrysene | PAH | 290 | D | 6.67 | | | | 330 | D | 7 |
| Dibenz[a,h]anthracene | PAH | 69 | D | 6.67 | | | | 93 | D | 7 |
| Fluoranthene | PAH | 230 | D | 6.67 | | | | 730 | D | 7 |
| Fluorene | PAH | 6.67 | UD | 6.67 | | | | 11 | D | 7 |
| Indeno(1,2,3-cd)pyrene | PAH | 320 | D | 6.67 | | | | 280 | D | 7 |
| Naphthalene | PAH | 66.7 | UD | 66.7 | | | | 70 | UD | 70 |
| Phenanthrene | PAH | 52 | D | 6.67 | | | | 35 | D | 7 |
| Pyrene | PAH | 150 | D | 6.67 | | | | 660 | D | 7 |
| Aroclor-1016 | PCB | 13 | U | 13 | 27 | UD | 27 | 14 | U | 14 |
| Aroclor-1221 | PCB | 13 | U | 13 | 27 | UD | 27 | 14 | U | 14 |
| Aroclor-1232 | PCB | 13 | U | 13 | 27 | UD | 27 | 14 | U | 14 |
| Aroclor-1242 | PCB | 13 | U | 13 | 27 | UD | 27 | 14 | U | 14 |
| Aroclor-1248 | PCB | 13 | U | 13 | 27 | UD | 27 | 14 | U | 14 |
| Aroclor-1254 | PCB | 13 | U | 13 | 220 | D | 27 | 14 | U | 14 |
| Aroclor-1260 | PCB | 13 | U | 13 | 150 | D | 27 | 8.9 | J | 14 |
| Aldrin | PEST | 1.3 | UD | 1.3 | 1.3 | UD | 1.3 | 1.4 | UD | 1.4 |
| Alpha-BHC | PEST | 1.3 | UD | 1.3 | 1.3 | UD | 1.3 | 1.4 | UD | 1.4 |
| alpha-Chlordane | PEST | 1.3 | UD | 1.3 | 1.3 | UD | 1.3 | 1.4 | UD | 1.4 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 1.3 | UD | 1.3 | 16 | XD | 1.3 | 1.4 | UD | 1.4 |
| Delta-BHC | PEST | 1.3 | UD | 1.3 | 1.3 | UD | 1.3 | 1.4 | UD | 1.4 |
| Dichlorodiphenyldichloroethane | PEST | 1.3 | UD | 1.3 | 13 | D | 1.3 | 1.4 | UD | 1.4 |
| Dichlorodiphenyldichloroethylene | PEST | 1.3 | UD | 1.3 | 7.8 | D | 1.3 | 1.4 | UD | 1.4 |
| Dichlorodiphenyltrichloroethane | PEST | 1.3 | UD | 1.3 | 1.3 | UD | 1.3 | 2.8 | JXD | 1.4 |
| Dieldrin | PEST | 1.3 | UD | 1.3 | 1.3 | UD | 1.3 | 1.4 | UD | 1.4 |
| Endosulfan I | PEST | 1.3 | UD | 1.3 | 1.3 | UD | 1.3 | 1.4 | UD | 1.4 |
| Endosulfan II | PEST | 1.3 | UD | 1.3 | 1.3 | UD | 1.3 | 1.4 | UD | 1.4 |
| Endosulfan sulfate | PEST | 1.3 | UD | 1.3 | 6.1 | JXD | 1.3 | 1.4 | UD | 1.4 |
| Endrin | PEST | 1.3 | UD | 1.3 | 1.3 | UD | 1.3 | 1.4 | UD | 1.4 |
| Endrin aldehyde | PEST | 1.3 | UD | 1.3 | 21 | D | 1.3 | 2.7 | JD | 1.4 |
| Endrin ketone | PEST | 1.3 | UD | 1.3 | 1.3 | JXD | 1.3 | 4.2 | JD | 1.4 |
| Gamma-BHC (Lindane) | PEST | 1.3 | UD | 1.3 | 1.3 | UD | 1.3 | 1.4 | UD | 1.4 |
| gamma-Chlordane | PEST | 1.3 | UD | 1.3 | 3.2 | JXD | 1.3 | 1.4 | UD | 1.4 |
| Heptachlor | PEST | 1.3 | UD | 1.3 | 1.3 | UD | 1.3 | 1.4 | UD | 1.4 |
| Heptachlor epoxide | PEST | 1.3 | UD | 1.3 | 1.3 | UD | 1.3 | 1.4 | UD | 1.4 |
| Methoxychlor | PEST | 1.3 | UD | 1.3 | 1.3 | UD | 1.3 | 1.4 | UD | 1.4 |
| Toxaphene | PEST | 13 | UD | 13 | 13 | UD | 13 | 14 | UD | 14 |
| 1,2,4-Trichlorobenzene | SVOA | | | | 2700 | UD | 2700 | | | |
| 1,2-Dichlorobenzene | SVOA | | | | 2700 | UD | 2700 | | | |
| 1,3-Dichlorobenzene | SVOA | | | | 2700 | UD | 2700 | | | |
| 1,4-Dichlorobenzene | SVOA | | | | 2700 | UD | 2700 | | | |
| 2,4,5-Trichlorophenol | SVOA | | | | 6700 | UD | 6700 | | | |
| 2,4,6-Trichlorophenol | SVOA | | | | 2700 | UD | 2700 | | | |
| 2,4-Dichlorophenol | SVOA | | | | 2700 | UD | 2700 | | | |
| 2,4-Dimethylphenol | SVOA | | | | 2700 | UD | 2700 | | | |
| 2,4-Dinitrophenol | SVOA | | | | 6700 | UD | 6700 | | | |
| 2,4-Dinitrotoluene | SVOA | | | | 2700 | UD | 2700 | | | |

## Table B-2. 100-H-28:2 Confirmatory Sample Results. (11 Pages).

| Sample Number | | J16VH0 | | | J16WB9 | | | J178R0 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Location | | 100-H-28:2 | | | 100-H-28:2 | | | 100-H-28:2 | | |
| Constituent | Class | 10/06/08 08:15 AM | | | 06/04/08 10:30 AM | | | 10/06/08 09:00 AM | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 2,6-Dinitrotoluene | SVOA | | | | 2700 | UD | 2700 | | | |
| 2-Chloronaphthalene | SVOA | | | | 2700 | UD | 2700 | | | |
| 2-Chlorophenol | SVOA | | | | 2700 | UD | 2700 | | | |
| 2-Methylnaphthalene | SVOA | | | | 2700 | UD | 2700 | | | |
| 2-Methylphenol (cresol, o-) | SVOA | | | | 2700 | UD | 2700 | | | |
| 2-Nitroaniline | SVOA | | | | 6700 | UD | 6700 | | | |
| 2-Nitrophenol | SVOA | | | | 2700 | UD | 2700 | | | |
| 3,3'-Dichlorobenzidine | SVOA | | | | 2700 | UD | 2700 | | | |
| 3+4 Methylphenol (cresol, m+p) | SVOA | | | | 2700 | UD | 2700 | | | |
| 3-Nitroaniline | SVOA | | | | 6700 | UD | 6700 | | | |
| 4,6-Dinitro-2-methylphenol | SVOA | | | | 6700 | UD | 6700 | | | |
| 4-Bromophenylphenyl ether | SVOA | | | | 2700 | UD | 2700 | | | |
| 4-Chloro-3-methylphenol | SVOA | | | | 2700 | UD | 2700 | | | |
| 4-Chloroaniline | SVOA | | | | 2700 | UD | 2700 | | | |
| 4-Chlorophenylphenyl ether | SVOA | | | | 2700 | UD | 2700 | | | |
| 4-Nitroaniline | SVOA | | | | 6700 | UD | 6700 | | | |
| 4-Nitrophenol | SVOA | | | | 6700 | UD | 6700 | | | |
| Acenaphthene | SVOA | | | | 550 | JD | 2700 | | | |
| Acenaphthylene | SVOA | | | | 2700 | UD | 2700 | | | |
| Anthracene | SVOA | | | | 890 | JD | 2700 | | | |
| Benzo(a)anthracene | SVOA | | | | 1400 | JD | 2700 | | | |
| Benzo(a)pyrene | SVOA | | | | 1200 | JD | 2700 | | | |
| Benzo(b)fluoranthene | SVOA | | | | 800 | JD | 2700 | | | |
| Benzo(ghi)perylene | SVOA | | | | 900 | JD | 2700 | | | |
| Benzo(k)fluoranthene | SVOA | | | | 960 | JD | 2700 | | | |
| Bis(2-chloro-1-methylethyl)ether | SVOA | | | | 2700 | UD | 2700 | | | |
| Bis(2-Chloroethoxy)methane | SVOA | | | | 2700 | UD | 2700 | | | |
| Bis(2-chloroethyl) ether | SVOA | | | | 2700 | UD | 2700 | | | |
| Bis(2-ethylhexyl) phthalate | SVOA | | | | 910 | JBD | 2700 | | | |
| Butylbenzylphthalate | SVOA | | | | 2700 | UD | 2700 | | | |
| Carbazole | SVOA | | | | 400 | JD | 2700 | | | |
| Chrysene | SVOA | | | | 1700 | JD | 2700 | | | |
| Dibenz[a,h]anthracene | SVOA | | | | 500 | JD | 2700 | | | |
| Dibenzofuran | SVOA | | | | 380 | JD | 2700 | | | |
| Diethyl phthalate | SVOA | | | | 2700 | UD | 2700 | | | |
| Dimethyl phthalate | SVOA | | | | 2700 | UD | 2700 | | | |
| Di-n-butylphthalate | SVOA | | | | 2700 | UD | 2700 | | | |
| Di-n-octylphthalate | SVOA | | | | 2700 | UD | 2700 | | | |
| Fluoranthene | SVOA | | | | 2600 | JD | 2700 | | | |
| Fluorene | SVOA | | | | 580 | JD | 2700 | | | |
| Hexachlorobenzene | SVOA | | | | 2700 | UD | 2700 | | | |
| Hexachlorobutadiene | SVOA | | | | 2700 | UD | 2700 | | | |
| Hexachlorocyclopentadiene | SVOA | | | | 2700 | UD | 2700 | | | |
| Hexachloroethane | SVOA | | | | 2700 | UD | 2700 | | | |
| Indeno(1,2,3-cd)pyrene | SVOA | | | | 800 | JD | 2700 | | | |
| Isophorone | SVOA | | | | 2700 | UD | 2700 | | | |
| Naphthalene | SVOA | | | | 230 | JD | 2700 | | | |
| Nitrobenzene | SVOA | | | | 2700 | UD | 2700 | | | |
| N-Nitroso-di-n-dipropylamine | SVOA | | | | 2700 | UD | 2700 | | | |
| N-Nitrosodiphenylamine | SVOA | | | | 2700 | UD | 2700 | | | |
| Pentachlorophenol | SVOA | | | | 6700 | UD | 6700 | | | |
| Phenanthrene | SVOA | | | | 3900 | D | 2700 | | | |
| Phenol | SVOA | | | | 2700 | UD | 2700 | | | |
| Pyrene | SVOA | | | | 3100 | D | 2700 | | | |

## Table B-2. 100-H-28:2 Confirmatory Sample Results. (11 Pages).

| Sample Number | | J17KK2 | | | J17KL2 | | | J17KL4 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Location | | 100-H-28:2 | | | 100-H-28:2 | | | 100-H-28:2 | | |
| Constituent | Class | 10/15/08 12:05 PM | | | 10/15/08 12:05 PM | | | 10/22/08 03:30 PM | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Aroclor-1016 | PCB | 1300 | U | 1300 | 16 | U | 16 | 14 | U | 14 |
| Aroclor-1221 | PCB | 1300 | U | 1300 | 16 | U | 16 | 14 | U | 14 |
| Aroclor-1232 | PCB | 1300 | U | 1300 | 16 | U | 16 | 14 | U | 14 |
| Aroclor-1242 | PCB | 1300 | U | 1300 | 16 | U | 16 | 14 | U | 14 |
| Aroclor-1248 | PCB | 1300 | U | 1300 | 16 | U | 16 | 14 | U | 14 |
| Aroclor-1254 | PCB | 1300 | U | 1300 | 16 | U | 16 | 14 | U | 14 |
| Aroclor-1260 | PCB | 17000 | | 1300 | 9 | J | 16 | 14 | U | 14 |
| 1,2,4-Trichlorobenzene | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 1,2-Dichlorobenzene | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 1,3-Dichlorobenzene | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 1,4-Dichlorobenzene | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 2,4,5-Trichlorophenol | SVOA | 840 | U | 840 | 970 | U | 970 | 850 | U | 850 |
| 2,4,6-Trichlorophenol | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 2,4-Dichlorophenol | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 2,4-Dimethylphenol | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 2,4-Dinitrophenol | SVOA | 840 | U | 840 | 970 | U | 970 | 850 | U | 850 |
| 2,4-Dinitrotoluene | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 2,6-Dinitrotoluene | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 2-Chloronaphthalene | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 2-Chlorophenol | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 2-Methylnaphthalene | SVOA | 30 | J | 330 | 390 | U | 390 | 340 | U | 340 |
| 2-Methylphenol (cresol, o-) | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 2-Nitroaniline | SVOA | 840 | U | 840 | 970 | U | 970 | 850 | U | 850 |
| 2-Nitrophenol | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 3,3'-Dichlorobenzidine | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 3-Nitroaniline | SVOA | 840 | U | 840 | 970 | U | 970 | 850 | U | 850 |
| 4,6-Dinitro-2-methylphenol | SVOA | 840 | U | 840 | 970 | U | 970 | 850 | U | 850 |
| 4-Bromophenylphenyl ether | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 4-Chloro-3-methylphenol | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 4-Chloroaniline | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 4-Chlorophenylphenyl ether | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| 4-Nitroaniline | SVOA | 840 | U | 840 | 970 | U | 970 | 850 | U | 850 |
| 4-Nitrophenol | SVOA | 840 | U | 840 | 970 | U | 970 | 850 | U | 850 |
| Acenaphthene | SVOA | 180 | J | 330 | 390 | U | 390 | 340 | U | 340 |
| Acenaphthylene | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| Anthracene | SVOA | 270 | J | 330 | 390 | U | 390 | 340 | U | 340 |
| Benzo(a)anthracene | SVOA | 620 | | 330 | 390 | U | 390 | 340 | U | 340 |
| Benzo(a)pyrene | SVOA | 590 | | 330 | 390 | U | 390 | 340 | U | 340 |
| Benzo(b)fluoranthene | SVOA | 450 | | 330 | 390 | U | 390 | 340 | U | 340 |
| Benzo(ghi)perylene | SVOA | 410 | | 330 | 390 | U | 390 | 340 | U | 340 |
| Benzo(k)fluoranthene | SVOA | 530 | | 330 | 390 | U | 390 | 340 | U | 340 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| Bis(2-Chloroethoxy)methane | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| Bis(2-chloroethyl) ether | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| Bis(2-ethylhexyl) phthalate | SVOA | 74 | JB | 330 | 56 | JB | 390 | 41 | JB | 340 |
| Butylbenzylphthalate | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| Carbazole | SVOA | 180 | J | 330 | 390 | U | 390 | 340 | U | 340 |
| Chrysene | SVOA | 870 | | 330 | 390 | U | 390 | 340 | U | 340 |
| Dibenz[a,h]anthracene | SVOA | 150 | J | 330 | 390 | U | 390 | 340 | U | 340 |
| Dibenzofuran | SVOA | 86 | J | 330 | 390 | U | 390 | 340 | U | 340 |
| Diethyl phthalate | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| Dimethyl phthalate | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| Di-n-butylphthalate | SVOA | 65 | J | 330 | 390 | U | 390 | 340 | U | 340 |
| Di-n-octylphthalate | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |

## Table B-2. 100-H-28:2 Confirmatory Sample Results. (11 Pages).

| Sample Number | | J17KK2 | | | J17KL2 | | | J17KL4 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Location | | 100-H-28:2 | | | 100-H-28:2 | | | 100-H-28:2 | | |
| Constituent | Class | 10/15/08 12:05 PM | | | 10/15/08 12:05 PM | | | 10/22/08 03:30 PM | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Fluoranthene | SVOA | 1500 | | 330 | 390 | U | 390 | 340 | U | 340 |
| Fluorene | SVOA | 140 | J | 330 | 390 | U | 390 | 340 | U | 340 |
| Hexachlorobenzene | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| Hexachlorobutadiene | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| Hexachlorocyclopentadiene | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| Hexachloroethane | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| Indeno(1,2,3-cd)pyrene | SVOA | 370 | | 330 | 390 | U | 390 | 340 | U | 340 |
| Isophorone | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| Naphthalene | SVOA | 80 | J | 330 | 390 | U | 390 | 340 | U | 340 |
| Nitrobenzene | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| N-Nitroso-di-n-dipropylamine | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| N-Nitrosodiphenylamine | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| Pentachlorophenol | SVOA | 840 | U | 840 | 970 | U | 970 | 850 | U | 850 |
| Phenanthrene | SVOA | 1500 | | 330 | 390 | U | 390 | 340 | U | 340 |
| Phenol | SVOA | 330 | U | 330 | 390 | U | 390 | 340 | U | 340 |
| Pyrene | SVOA | 1600 | | 330 | 390 | U | 390 | 340 | U | 340 |

| Sample Number | | J17W36 | | | J17YR9 | | |
|---|---|---|---|---|---|---|---|
| Location | | 100-H-28:2 | | | 100-H-28:2 | | |
| Constituent | Class | 11/10/08 12:00 PM | | | 12/02/08 07:41 AM | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Acenaphthene | PAH | 35.7 | U | 35.7 | | | |
| Acenaphthylene | PAH | 35.7 | U | 35.7 | | | |
| Anthracene | PAH | 3.57 | U | 3.57 | | | |
| Benzo(a)anthracene | PAH | 4.8 | | 3.57 | | | |
| Benzo(a)pyrene | PAH | 8 | | 3.57 | | | |
| Benzo(b)fluoranthene | PAH | 10 | | 3.57 | | | |
| Benzo(ghi)perylene | PAH | 7 | | 3.57 | | | |
| Benzo(k)fluoranthene | PAH | 3.7 | | 3.57 | | | |
| Chrysene | PAH | 5.7 | | 3.57 | | | |
| Dibenz[a,h]anthracene | PAH | 1.1 | J | 3.57 | | | |
| Fluoranthene | PAH | 13 | | 3.57 | | | |
| Fluorene | PAH | 2 | J | 3.57 | | | |
| Indeno(1,2,3-cd)pyrene | PAH | 6.9 | | 3.57 | | | |
| Naphthalene | PAH | 35.7 | U | 35.7 | | | |
| Phenanthrene | PAH | 5.5 | | 3.57 | | | |
| Pyrene | PAH | 7.6 | | 3.57 | | | |
| Aroclor-1016 | PCB | 14 | U | 14 | 14 | U | 14 |
| Aroclor-1221 | PCB | 14 | U | 14 | 14 | U | 14 |
| Aroclor-1232 | PCB | 14 | U | 14 | 14 | U | 14 |
| Aroclor-1242 | PCB | 14 | U | 14 | 14 | U | 14 |
| Aroclor-1248 | PCB | 14 | U | 14 | 14 | U | 14 |
| Aroclor-1254 | PCB | 14 | U | 14 | 14 | U | 14 |
| Aroclor-1260 | PCB | 14 | U | 14 | 14 | U | 14 |
| Aldrin | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| Alpha-BHC | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| alpha-Chlordane | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| Delta-BHC | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| Dichlorodiphenyldichloroethane | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| Dichlorodiphenyldichloroethylene | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| Dichlorodiphenyltrichloroethane | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| Dieldrin | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| Endosulfan I | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| Endosulfan II | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |

## Table B-2. 100-H-28:2 Confirmatory Sample Results. (11 Pages).

| Sample Number | | J17W36 | | | J17YR9 | | |
|---|---|---|---|---|---|---|---|
| Location | | 100-H-28:2 | | | 100-H-28:2 | | |
| Constituent | Class | 11/10/08 12:00 PM | | | 12/02/08 07:41 AM | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Endosulfan sulfate | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| Endrin | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| Endrin aldehyde | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| Endrin ketone | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| Gamma-BHC (Lindane) | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| gamma-Chlordane | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| Heptachlor | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| Heptachlor epoxide | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| Methoxychlor | PEST | 0.04 | UD | 0.04 | 1.4 | UD | 1.4 |
| Toxaphene | PEST | 14 | UD | 14 | 14 | UD | 14 |
| 1,1,1-Trichloroethane | VOA | | | | 5 | U | 5 |
| 1,1,2,2-Tetrachloroethane | VOA | | | | 5 | U | 5 |
| 1,1,2-Trichloroethane | VOA | | | | 5 | U | 5 |
| 1,1-Dichloroethane | VOA | | | | 5 | U | 5 |
| 1,1-Dichloroethene | VOA | | | | 5 | U | 5 |
| 1,2-Dichloroethane | VOA | | | | 5 | U | 5 |
| 1,2-Dichloroethene(Total) | VOA | | | | 5 | U | 5 |
| 1,2-Dichloropropane | VOA | | | | 5 | U | 5 |
| 2-Butanone | VOA | | | | 10 | U | 10 |
| 2-Hexanone | VOA | | | | 10 | U | 10 |
| 4-Methyl-2-Pentanone | VOA | | | | 10 | U | 10 |
| Acetone | VOA | | | | 10 | U | 10 |
| Benzene | VOA | | | | 5 | U | 5 |
| Bromodichloromethane | VOA | | | | 5 | U | 5 |
| Bromoform | VOA | | | | 5 | U | 5 |
| Bromomethane | VOA | | | | 10 | U | 10 |
| Carbon disulfide | VOA | | | | 5 | U | 5 |
| Carbon tetrachloride | VOA | | | | 5 | U | 5 |
| Chlorobenzene | VOA | | | | 5 | U | 5 |
| Chloroethane | VOA | | | | 10 | U | 10 |
| Chloroform | VOA | | | | 5 | U | 5 |
| Chloromethane | VOA | | | | 10 | U | 10 |
| cis-1,2-Dichloroethylene | VOA | | | | 5 | U | 5 |
| cis-1,3-Dichloropropene | VOA | | | | 5 | U | 5 |
| Dibromochloromethane | VOA | | | | 5 | U | 5 |
| Ethylbenzene | VOA | | | | 5 | U | 5 |
| Methylenechloride | VOA | | | | 8 | B | 5 |
| Styrene | VOA | | | | 5 | U | 5 |
| Tetrachloroethene | VOA | | | | 5 | U | 5 |
| Toluene | VOA | | | | 5 | U | 5 |
| trans-1,2-Dichloroethylene | VOA | | | | 5 | U | 5 |
| trans-1,3-Dichloropropene | VOA | | | | 5 | U | 5 |
| Trichloroethene | VOA | | | | 5 | U | 5 |
| Vinyl chloride | VOA | | | | 10 | U | 10 |
| Xylenes (total) | VOA | | | | 5 | U | 5 |

**Table B-3. 100-H-28:2 and 100-H-42 In-Process Sample Summary Table.**

| Sample Number | Sample Description |
|---|---|
| J1K576 | 100-H-28:2 pipeline segment along 190-H foundation, N 152679.0, E 577695.0 |
| J1K577 | Composite sample from a small 100-H-28:2 overburden pile |
| J1M6X3 | 100-H-28:2 SPA |
| J1M6X6 | 100-H-28:2 SPA |
| J1RWF4 | 100-H-28:2 manhole sample at 9 ft bgs, N 152556, E 577732 |
| J1T069 | Bag of soil with radioactive labels found and placed in drum 100H-13-1381 |
| J1T336 | Soils at crushed drum anomaly (100-H-28:2) |
| J1T3W4 | Crushed drum soil (100-H-28:2) |
| J1T607 | French drain location, red rock, N152751.8, E577806.5 (100-H-28:2) |
| J1T697 | 100-H-42 SPA |
| J1T6V6 | 100-H-42 SPA material, dark colored soil |

## Table B-4. 100-H-28:2 and 100-H-42 In-Process Results. (6 Pages).

| Waste Site | Sample Number | Sample Date | Aluminum | | | Antimony | | | Arsenic | | | Barium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J1K576 | 10/6/11 | 5920 | | 1.5 | 0.36 | B | 0.36 | 5.1 | | 0.63 | 50.1 | | 0.072 |
| 100-H-28:2 | J1K577 | 10/6/11 | 6620 | | 1.5 | 0.63 | | 0.37 | 8.1 | | 0.64 | 61.5 | | 0.074 |
| 100-H-28:2 | J1M6X3 | 11/9/11 | | | | | | | | | | | | |
| 100-H-28:2 | J1M6X6 | 11/9/11 | | | | | | | | | | | | |
| 100-H-28:2 | J1T069 | 9/4/13 | 4570 | | 1.6 | 0.40 | U | 0.40 | 5.4 | | 0.7 | 77.8 | | 0.081 |
| 100-H-28:2 | J1T336 | 10/2/13 | 6730 | | 1.5 | 0.48 | B | 0.36 | 2.8 | | 0.63 | 136 | | 0.073 |
| 100-H-28:2 | J1T607 | 11/18/13 | 7840 | | 1.4 | 0.33 | U | 0.33 | 5.5 | | 0.58 | 88.6 | | 0.067 |
| 100-H-42 | J1T697 | 11/20/13 | | | | | | | 5.8 | M | 0.64 | 135 | X | 0.074 |
| 100-H-42 | J1T6V6 | 12/11/13 | 8830 | | 1.4 | 0.34 | U | 0.34 | 3.6 | | 0.58 | 263 | | 0.067 |

| Waste Site | Sample Number | Sample Date | Beryllium | | | Boron | | | Cadmium | | | Calcium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J1K576 | 10/6/11 | 0.094 | B | 0.031 | 0.93 | U | 0.93 | 0.10 | BM | 0.039 | 10700 | | 13.4 |
| 100-H-28:2 | J1K577 | 10/6/11 | 0.13 | B | 0.032 | 2.3 | | 0.95 | 0.18 | B | 0.04 | 9160 | | 13.7 |
| 100-H-28:2 | J1M6X3 | 11/9/11 | | | | | | | | | | | | |
| 100-H-28:2 | J1M6X6 | 11/9/11 | | | | | | | | | | | | |
| 100-H-28:2 | J1T069 | 9/4/13 | 0.16 | B | 0.035 | 5.5 | N | 1.0 | 0.36 | | 0.044 | 3670 | | 15.0 |
| 100-H-28:2 | J1T336 | 10/2/13 | 0.25 | | 0.032 | 10.5 | | 0.94 | 0.22 | | 0.039 | 12000 | | 13.5 |
| 100-H-28:2 | J1T607 | 11/18/13 | 0.12 | BM | 0.029 | 3.9 | | 0.86 | 0.84 | M | 0.036 | 5730 | | 12.4 |
| 100-H-42 | J1T697 | 11/20/13 | 0.032 | U | 0.032 | | | | 0.14 | BM | 0.040 | | | |
| 100-H-42 | J1T6V6 | 12/11/13 | 0.39 | M | 0.029 | 41.5 | | 0.87 | 0.15 | B | 0.036 | 10900 | | 12.5 |

| Waste Site | Sample Number | Sample Date | Chromium | | | Cobalt | | | Copper | | | Hexavalent Chromium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J1K576 | 10/6/11 | 14.5 | X | 0.055 | 5.8 | | 0.095 | 16.9 | | 0.21 | | | |
| 100-H-28:2 | J1K577 | 10/6/11 | 72.8 | X | 0.056 | 6.5 | | 0.097 | 39.3 | | 0.21 | 0.803 | | 0.155 |
| 100-H-28:2 | J1M6X3 | 11/9/11 | | | | | | | | | | 0.155 | U | 0.155 |
| 100-H-28:2 | J1M6X6 | 11/9/11 | | | | | | | | | | 0.155 | U | 0.155 |
| 100-H-28:2 | J1T069 | 9/4/13 | 21.5 | | 0.062 | 6.5 | X | 0.11 | 48.9 | N | 0.23 | | | |
| 100-H-28:2 | J1T336 | 10/2/13 | 12.8 | | 0.056 | 5.2 | X | 0.096 | 24.4 | | 0.21 | | | |
| 100-H-28:2 | J1T607 | 11/18/13 | 12.8 | | 0.051 | 5.9 | | 0.088 | 17.2 | | 0.19 | 0.155 | U | 0.155 |
| 100-H-42 | J1T697 | 11/20/13 | 8.6 | X | 0.056 | | | | | | | | | |
| 100-H-42 | J1T6V6 | 12/11/13 | 7.5 | | 0.051 | 4.0 | | 0.088 | 25.8 | | 0.19 | | | |

| Waste Site | Sample Number | Sample Date | Iron | | | Lead | | | Magnesium | | | Manganese | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J1K576 | 10/6/11 | 17600 | | 3.6 | 12.9 | M | 0.26 | 3710 | | 3.5 | 250 | | 0.095 |
| 100-H-28:2 | J1K577 | 10/6/11 | 19200 | | 3.7 | 27.9 | | 0.26 | 4000 | | 3.6 | 271 | | 0.097 |
| 100-H-28:2 | J1M6X3 | 11/9/11 | | | | | | | | | | | | |
| 100-H-28:2 | J1M6X6 | 11/9/11 | | | | | | | | | | | | |
| 100-H-28:2 | J1T069 | 9/4/13 | 30200 | | 4.0 | 12.0 | | 0.29 | 2730 | | 3.9 | 266 | | 0.11 |
| 100-H-28:2 | J1T336 | 10/2/13 | 17400 | | 3.6 | 26.7 | | 0.26 | 3970 | | 3.5 | 250 | | 0.096 |
| 100-H-28:2 | J1T607 | 11/18/13 | 15200 | | 3.3 | 37.4 | | 0.24 | 4140 | | 3.2 | 240 | | 0.088 |
| 100-H-42 | J1T697 | 11/20/13 | | | | 14.7 | XM | 0.26 | | | | | | |
| 100-H-42 | J1T6V6 | 12/11/13 | 10500 | | 3.4 | 22.4 | | 0.24 | 3470 | | 3.3 | 150 | | 0.088 |

## Table B-4. 100-H-28:2 and 100-H-42 In-Process Results. (6 Pages).

| Waste Site | Sample Number | Sample Date | Mercury | | | Molybdenum | | | Nickel | | | Potassium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J1K576 | 10/6/11 | 0.022 | | 0.0053 | 0.33 | B | 0.25 | 9.3 | X | 0.12 | 812 | | 39.0 |
| 100-H-28:2 | J1K577 | 10/6/11 | 0.047 | | 0.0051 | 5.9 | | 0.25 | 9.9 | X | 0.12 | 1030 | | 39.9 |
| 100-H-28:2 | J1M6X3 | 11/9/11 | | | | | | | | | | | | |
| 100-H-28:2 | J1M6X6 | 11/9/11 | | | | | | | | | | | | |
| 100-H-28:2 | J1T069 | 9/4/13 | 0.43 | N | 0.0057 | 0.88 | BM | 0.28 | 14.5 | | 0.13 | 700 | | 43.5 |
| 100-H-28:2 | J1T336 | 10/2/13 | 0.037 | M | 0.0072 | 0.48 | BM | 0.25 | 11.4 | | 0.12 | 892 | | 39.3 |
| 100-H-28:2 | J1T607 | 11/18/13 | 0.038 | | 0.0066 | 0.23 | U | 0.23 | 11.3 | | 0.11 | 1150 | | 36.0 |
| 100-H-42 | J1T697 | 11/20/13 | 0.012 | BMN | 0.0056 | | | | | | | | | |
| 100-H-42 | J1T6V6 | 12/11/13 | 0.060 | | 0.006 | 0.95 | B | 0.23 | 8.4 | | 0.11 | 899 | | 36.3 |

| Waste Site | Sample Number | Sample Date | Selenium | | | Silicon | | | Silver | | | Sodium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 100-H-28:2 | J1K576 | 10/6/11 | 0.82 | U | 0.82 | 318 | | 5.4 | 0.15 | U | 0.15 | 231 | | 56.2 |
| 100-H-28:2 | J1K577 | 10/6/11 | 0.84 | U | 0.84 | 485 | | 5.5 | 0.16 | U | 0.16 | 239 | | 57.4 |
| 100-H-28:2 | J1M6X3 | 11/9/11 | | | | | | | | | | | | |
| 100-H-28:2 | J1M6X6 | 11/9/11 | | | | | | | | | | | | |
| 100-H-28:2 | J1T069 | 9/4/13 | 0.91 | U | 0.91 | 518 | N | 6.0 | 0.17 | U | 0.17 | 245 | | 62.6 |
| 100-H-28:2 | J1T336 | 10/2/13 | 0.82 | U | 0.82 | 254 | | 5.4 | 0.15 | U | 0.15 | 265 | | 56.6 |
| 100-H-28:2 | J1T607 | 11/18/13 | 0.75 | U | 0.75 | 210 | N | 5.0 | 0.14 | U | 0.14 | 261 | | 51.8 |
| 100-H-42 | J1T697 | 11/20/13 | 0.84 | U | 0.84 | | | | 0.16 | U | 0.16 | | | |
| 100-H-42 | J1T6V6 | 12/11/13 | 0.76 | U | 0.76 | 214 | N | 5.0 | 0.14 | U | 0.14 | 639 | | 52.2 |

| Waste Site | Sample Number | Sample Date | Vanadium | | | Zinc | | | TPH - Diesel Ext | | | TPH - Diesel | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 100-H-28:2 | J1K576 | 10/6/11 | 46.0 | | 0.090 | 45.6 | X | 0.38 | | | | | | |
| 100-H-28:2 | J1K577 | 10/6/11 | 41.1 | | 0.091 | 93.4 | X | 0.39 | | | | | | |
| 100-H-28:2 | J1M6X3 | 11/9/11 | | | | | | | | | | | | |
| 100-H-28:2 | J1M6X6 | 11/9/11 | | | | | | | | | | | | |
| 100-H-28:2 | J1T069 | 9/4/13 | 41.3 | | 0.10 | 42.9 | | 0.42 | | | | | | |
| 100-H-28:2 | J1T336 | 10/2/13 | 36.0 | | 0.090 | 194 | | 0.38 | | | | | | |
| 100-H-28:2 | J1T607 | 11/18/13 | 33.7 | | 0.082 | 96.1 | | 0.35 | | | | | | |
| 100-H-42 | J1T697 | 11/20/13 | | | | | | | | | | | | |
| 100-H-42 | J1T6V6 | 12/11/13 | 27.7 | | 0.083 | 60.3 | X | 0.35 | 98000 | N | 960 | 72000 | N | 660 |

| Waste Site | Sample Number | Sample Date | Percent Moisture (wet sample) | | |
|---|---|---|---|---|---|
| | | | % | Q | PQL |
| 100-H-28:2 | J1K576 | 10/6/11 | 0.1 | U | 0.1 |
| 100-H-28:2 | J1K577 | 10/6/11 | 2.1 | | 0.1 |
| 100-H-28:2 | J1M6X3 | 11/9/11 | | | |
| 100-H-28:2 | J1M6X6 | 11/9/11 | | | |
| 100-H-28:2 | J1T069 | 9/4/13 | 13.5 | | 0.1 |
| 100-H-28:2 | J1T336 | 10/2/13 | 9.3 | | 0.1 |
| 100-H-28:2 | J1T607 | 11/18/13 | | | |
| 100-H-42 | J1T697 | 11/20/13 | 4.7 | | 0.1 |
| 100-H-42 | J1T6V6 | 12/11/13 | | | |

## Table B-4. 100-H-28:2 and 100-H-42 In-Process Results. (6 Pages).

| Waste Site | Sample Number | Sample Date | Arsenic - TCLP | | | Barium - TCLP | | | Cadmium -TCLP | | | Chromium - TCLP | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL |
| 100-H-28:2 | J1K576 | 10/6/11 | 0.023 | B | 0.022 | 0.39 | B | 0.0020 | 0.0020 | U | 0.0020 | 0.031 | B | 0.003 |
| 100-H-28:2 | J1K577 | 10/6/11 | 0.022 | U | 0.022 | 0.44 | B | 0.0020 | 0.0041 | B | 0.0020 | 0.056 | B | 0.003 |
| 100-H-28:2 | J1RWF4 | 8/12/13 | 0.022 | U | 0.022 | 0.27 | B | 0.0020 | 0.040 | B | 0.0020 | 0.0038 | B | 0.003 |

| Waste Site | Sample Number | Sample Date | Lead - TCLP | | | Mercury - TCLP | | | Selenium - TCLP | | | Silver - TCLP | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL |
| 100-H-28:2 | J1K576 | 10/6/11 | 0.013 | U | 0.013 | 0.000030 | UN | 0.000030 | 0.024 | U | 0.024 | 0.0040 | U | 0.0040 |
| 100-H-28:2 | J1K577 | 10/6/11 | 0.072 | B | 0.013 | 0.000030 | U | 0.000030 | 0.024 | U | 0.024 | 0.0040 | U | 0.0040 |
| 100-H-28:2 | J1RWF4 | 8/12/13 | 0.12 | B | 0.013 | 0.000030 | U | 0.000030 | 0.024 | U | 0.024 | 0.0040 | U | 0.0040 |

| Waste Site | Sample Number | Sample Date | 1,1-Dichloroethene TCLP | | | 1,2-Dichloroethane TCLP | | | 1,4-Dichlorobenzene TCLP | | | 2,4,5-Trichlorophenol TCLP | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL |
| 100-H-28:2 | J1T3W4 | 10/14/13 | 0.0092 | U | 0.0092 | 0.0052 | U | 0.0052 | 0.57 | X | 0.0016 | 0.0022 | U | 0.0022 |

| Waste Site | Sample Number | Sample Date | 2,4,6-Trichlorophenol TCLP | | | 2,4-Dinitrotoluene TCLP | | | 2-Butanone TCLP | | | 2-Methylphenol (cresol, o-) - TCLP | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL |
| 100-H-28:2 | J1T3W4 | 10/14/13 | 0.0014 | U | 0.0014 | 0.0083 | U | 0.0083 | 0.15 | J | 0.073 | 0.0049 | U | 0.0049 |

| Waste Site | Sample Number | Sample Date | 3+4 Methylphenol (cresol, m+p) - TCLP | | | Benzene - TCLP | | | Carbon tetrachloride TCLP | | | Chlorobenzene - TCLP | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL |
| 100-H-28:2 | J1T3W4 | 10/14/13 | 0.0013 | U | 0.0013 | 0.0064 | U | 0.0064 | 0.0076 | U | 0.0076 | 0.0068 | U | 0.0068 |

| Waste Site | Sample Number | Sample Date | Chloroform - TCLP | | | Endrin - TCLP | | | Gamma-BHC (Lindane) - TCLP | | | Heptachlor epoxide - TCLP | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL |
| 100-H-28:2 | J1T3W4 | 10/14/13 | 0.0064 | U | 0.0064 | 7.9E-05 | U | 7.9E-05 | 6.9E-05 | U | 6.9E-05 | 7.5E-05 | U | 7.5E-05 |

| Waste Site | Sample Number | Sample Date | Heptachlor - TCLP | | | Hexachlorobenzene - TCLP | | | Hexachlorobutadiene TCLP | | | Hexachloroethane TCLP | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL |
| 100-H-28:2 | J1T3W4 | 10/14/13 | 7.7E-05 | U | 7.7E-05 | 0.0033 | U | 0.0033 | 0.017 | U | 0.017 | 0.011 | U | 0.011 |

| Waste Site | Sample Number | Sample Date | Methoxychlor - TCLP | | | Nitrobenzene - TCLP | | | Pentachlorophenol - TCLP | | | Pyridine - TCLP | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL |
| 100-H-28:2 | J1T3W4 | 10/14/13 | 0.00013 | U | 0.00013 | 0.0041 | U | 0.0041 | 0.10 | U | 0.10 | 0.0057 | U | 0.0057 |

| Waste Site | Sample Number | Sample Date | Tetrachloroethene - TCLP | | | Toxaphene - TCLP | | | Trichloroethene - TCLP | | | Vinyl chloride - TCLP | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL |
| 100-H-28:2 | J1T3W4 | 10/14/13 | 0.0080 | U | 0.0080 | 0.0037 | U | 0.0037 | 0.0064 | U | 0.0064 | 0.0040 | U | 0.0040 |

| Waste Site | Sample Number | Sample Date | alpha-Chlordane - TCLP | | | gamma-Chlordane - TCLP | | |
|---|---|---|---|---|---|---|---|---|
| | | | mg/L | Q | PQL | mg/L | Q | PQL |
| 100-H-28:2 | J1T3W4 | 10/14/13 | 5.3E-05 | U | 5.3E-05 | 9.1E-05 | U | 9.1E-05 |

## Table B-4. 100-H-28:2 and 100-H-42 In-Process Results. (6 Pages).

| CONSTITUENT | CLASS | J1T069 100-H-28:2 | | | J1T336 100-H-28:2 | | | J1T6V6 100-H-42 SPA | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 09/04/13 | | | 10/02/13 | | | 12/11/13 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 2-(2,4,5-Trichlorophenoxy)propionic acid | HERB | | | | 150 | UD | 150 | | | |
| 2-(2-methyl-4-chlorophenoxy) propionic acid | HERB | | | | 210000 | UD | 210000 | | | |
| 2,4,5-Trichlorophenoxyacetic acid | HERB | | | | 250 | UD | 250 | | | |
| 2,4-Dichlorophenoxyacetic acid | HERB | | | | 1500 | UD | 1500 | | | |
| 2-Methyl-4 chlorophenoxyacetic acid | HERB | | | | 210000 | UD | 210000 | | | |
| 2-secButyl-4,6-dinitrophenol(DNBP) | HERB | | | | 150 | UDN | 150 | | | |
| 4-(2,4-Dichlorophenoxy)butanoic acid | HERB | | | | 800 | UD | 800 | | | |
| Dalapon | HERB | | | | 150 | UD | 150 | | | |
| Dicamba | HERB | | | | 150 | UD | 150 | | | |
| Dichloroprop | HERB | | | | 340 | UD | 340 | | | |
| Acenaphthene | PAH | | | | | | | 1900 | D | 49 |
| Acenaphthylene | PAH | | | | | | | 44 | UD | 44 |
| Anthracene | PAH | | | | | | | 15 | UD | 15 |
| Benzo(a)anthracene | PAH | | | | | | | 680 | D | 16 |
| Benzo(a)pyrene | PAH | | | | | | | 270 | D | 32 |
| Benzo(b)fluoranthene | PAH | | | | | | | 380 | D | 21 |
| Benzo(ghi)perylene | PAH | | | | | | | 170 | DX | 36 |
| Benzo(k)fluoranthene | PAH | | | | | | | 190 | D | 19 |
| Chrysene | PAH | | | | | | | 480 | XD | 24 |
| Dibenz[a,h]anthracene | PAH | | | | | | | 54 | UD | 54 |
| Fluoranthene | PAH | | | | | | | 2500 | D | 64 |
| Fluorene | PAH | | | | | | | 1400 | D | 26 |
| Indeno(1,2,3-cd)pyrene | PAH | | | | | | | 140 | JD | 59 |
| Naphthalene | PAH | | | | | | | 4600 | D | 59 |
| Phenanthrene | PAH | | | | | | | 4600 | XD | 59 |
| Pyrene | PAH | | | | | | | 2800 | D | 59 |
| Aroclor-1016 | PCB | 3.0 | U | 3.0 | 3000000 | UD | 3000000 | 2.5 | U | 2.5 |
| Aroclor-1221 | PCB | 8.7 | U | 8.7 | 8800000 | UD | 8800000 | 7.3 | U | 7.3 |
| Aroclor-1232 | PCB | 2.2 | U | 2.2 | 2200000 | UD | 2200000 | 1.8 | U | 1.8 |
| Aroclor-1242 | PCB | 5.1 | U | 5.1 | 5100000 | UD | 5100000 | 4.3 | U | 4.3 |
| Aroclor-1248 | PCB | 5.1 | U | 5.1 | 5100000 | UD | 5100000 | 4.3 | U | 4.3 |
| Aroclor-1254 | PCB | 2.8 | U | 2.8 | 2800000 | UD | 2800000 | 18 | | 2.4 |
| Aroclor-1260 | PCB | 36 | | 2.8 | 1.4E+08 | DBN | 2800000 | 2.4 | U | 2.4 |
| Aldrin | PEST | | | | 270000 | UD | 270000 | 0.25 | U | 0.25 |
| Alpha-BHC | PEST | | | | 230000 | UD | 230000 | 0.21 | U | 0.21 |
| alpha-Chlordane | PEST | | | | 350000 | UD | 350000 | 0.32 | U | 0.32 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | | | | 710000 | UD | 710000 | 0.66 | UN | 0.66 |
| Delta-BHC | PEST | | | | 430000 | UD | 430000 | 0.4 | U | 0.40 |
| Dichlorodiphenyldichloroethane | PEST | | | | 590000 | UD | 590000 | 3.0 | | 0.54 |
| Dichlorodiphenyldichloroethylene | PEST | | | | 260000 | UD | 260000 | 11 | | 0.24 |
| Dichlorodiphenyltrichloroethane | PEST | | | | 1400000 | JXD | 630000 | 2.0 | | 0.59 |
| Dieldrin | PEST | | | | 230000 | UD | 230000 | 0.45 | JNX | 0.21 |
| Endosulfan I | PEST | | | | 190000 | UD | 190000 | 0.18 | UN | 0.18 |
| Endosulfan II | PEST | | | | 310000 | UD | 310000 | 0.29 | UN | 0.29 |
| Endosulfan sulfate | PEST | | | | 300000 | UD | 300000 | 0.28 | U | 0.28 |
| Endrin | PEST | | | | 330000 | UD | 330000 | 0.3 | UN | 0.30 |
| Endrin aldehyde | PEST | | | | 180000 | UD | 180000 | 0.17 | U | 0.17 |
| Endrin ketone | PEST | | | | 530000 | UD | 530000 | 0.49 | U | 0.49 |
| Gamma-BHC (Lindane) | PEST | | | | 500000 | UD | 500000 | 0.46 | U | 0.46 |
| gamma-Chlordane | PEST | | | | 290000 | UD | 290000 | 0.27 | U | 0.27 |
| Heptachlor | PEST | | | | 230000 | UD | 230000 | 0.21 | UN | 0.21 |

## Table B-4. 100-H-28:2 and 100-H-42 In-Process Results. (6 Pages).

| CONSTITUENT | CLASS | J1T069 100-H-28:2 09/04/13 01:42 PM | | | J1T336 100-H-28:2 10/02/13 08:42 AM | | | J1T6V6 100-H-42 SPA 12/11/13 09:45 AM | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Heptachlor epoxide | PEST | | | | 460000 | UD | 460000 | 0.42 | UN | 0.42 |
| Methoxychlor | PEST | | | | 480000 | UD | 480000 | 0.45 | U | 0.45 |
| Toxaphene | PEST | | | | 17000000 | UD | 17000000 | 16 | U | 16 |
| 1,2,4-Trichlorobenzene | SVOA | | | | 28000000 | BD | 240000 | 26 | U | 26 |
| 1,2-Dichlorobenzene | SVOA | | | | 320000 | D | 19000 | 21 | U | 21 |
| 1,3-Dichlorobenzene | SVOA | | | | 10000 | UD | 10000 | 11 | U | 11 |
| 1,4-Dichlorobenzene | SVOA | | | | 660000 | D | 12000 | 13 | U | 13 |
| 2,4,5-Trichlorophenol | SVOA | | | | 8700 | UD | 8700 | 9.5 | U | 9.5 |
| 2,4,6-Trichlorophenol | SVOA | | | | 8700 | UD | 8700 | 9.5 | U | 9.5 |
| 2,4-Dichlorophenol | SVOA | | | | 8700 | UD | 8700 | 9.5 | U | 9.5 |
| 2,4-Dimethylphenol | SVOA | | | | 58000 | UD | 58000 | 62 | U | 62 |
| 2,4-Dinitrophenol | SVOA | | | | 290000 | UD | 290000 | 320 | UX | 320 |
| 2,4-Dinitrotoluene | SVOA | | | | 58000 | UD | 58000 | 62 | U | 62 |
| 2,6-Dinitrotoluene | SVOA | | | | 24000 | UD | 24000 | 26 | U | 26 |
| 2-Chloronaphthalene | SVOA | | | | 8700 | UD | 8700 | 9.5 | U | 9.5 |
| 2-Chlorophenol | SVOA | | | | 18000 | UD | 18000 | 20 | U | 20 |
| 2-Methylnaphthalene | SVOA | | | | 17000 | UD | 17000 | 1300 | | 18 |
| 2-Methylphenol (cresol, o-) | SVOA | | | | 11000 | UD | 11000 | 12 | U | 12 |
| 2-Nitroaniline | SVOA | | | | 44000 | UD | 44000 | 47 | U | 47 |
| 2-Nitrophenol | SVOA | | | | 8700 | UD | 8700 | 9.5 | U | 9.5 |
| 3,3'-Dichlorobenzidine | SVOA | | | | 79000 | UD | 79000 | 85 | U | 85 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | | | | 29000 | UD | 29000 | 31 | U | 31 |
| 3-Nitroaniline | SVOA | | | | 64000 | UD | 64000 | 69 | U | 69 |
| 4,6-Dinitro-2-methylphenol | SVOA | | | | 290000 | UD | 290000 | 310 | UX | 310 |
| 4-Bromophenylphenyl ether | SVOA | | | | 17000 | UD | 17000 | 18 | U | 18 |
| 4-Chloro-3-methylphenol | SVOA | | | | 58000 | UD | 58000 | 62 | U | 62 |
| 4-Chloroaniline | SVOA | | | | 72000 | UD | 72000 | 78 | U | 78 |
| 4-Chlorophenylphenyl ether | SVOA | | | | 18000 | UD | 18000 | 20 | U | 20 |
| 4-Nitroaniline | SVOA | | | | 63000 | UD | 63000 | 69 | U | 69 |
| 4-Nitrophenol | SVOA | | | | 85000 | UD | 85000 | 92 | U | 92 |
| Acenaphthene | SVOA | | | | 9000 | UD | 9000 | 1900 | | 9.7 |
| Acenaphthylene | SVOA | | | | 15000 | UD | 15000 | 54 | J | 16 |
| Anthracene | SVOA | | | | 15000 | UD | 15000 | 1000 | | 16 |
| Benzo(a)anthracene | SVOA | | | | 17000 | UD | 17000 | 760 | | 19 |
| Benzo(a)pyrene | SVOA | | | | 17000 | UD | 17000 | 480 | | 19 |
| Benzo(b)fluoranthene | SVOA | | | | 23000 | UD | 23000 | 940 | K | 25 |
| Benzo(ghi)perylene | SVOA | | | | 14000 | UD | 14000 | 230 | J | 15 |
| Benzo(k)fluoranthene | SVOA | | | | 35000 | UD | 35000 | 38 | UK | 38 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | | | | 20000 | UD | 20000 | 22 | U | 22 |
| Bis(2-Chloroethoxy)methane | SVOA | | | | 20000 | UD | 20000 | 22 | U | 22 |
| Bis(2-chloroethyl) ether | SVOA | | | | 14000 | UD | 14000 | 16 | U | 16 |
| Bis(2-ethylhexyl) phthalate | SVOA | | | | 40000 | UD | 40000 | 120 | J | 44 |
| Butylbenzylphthalate | SVOA | | | | 38000 | UD | 38000 | 390 | | 41 |
| Carbazole | SVOA | | | | 31000 | UD | 31000 | 330 | | 34 |
| Chrysene | SVOA | | | | 24000 | UD | 24000 | 720 | | 26 |
| Dibenz[a,h]anthracene | SVOA | | | | 17000 | UD | 17000 | 89 | J | 18 |
| Dibenzofuran | SVOA | | | | 17000 | UD | 17000 | 1000 | | 19 |
| Diethyl phthalate | SVOA | | | | 23000 | UD | 23000 | 25 | U | 25 |
| Dimethyl phthalate | SVOA | | | | 20000 | UD | 20000 | 22 | U | 22 |
| Di-n-butylphthalate | SVOA | | | | 25000 | UD | 25000 | 27 | U | 27 |

## Table B-4. 100-H-28:2 and 100-H-42 In-Process Results. (6 Pages).

| CONSTITUENT | CLASS | J1T069 | | | J1T336 | | | J1T6V6 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 09/04/13 01:42 PM | | | 10/02/13 08:42 AM | | | 12/11/13 09:45 AM | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Di-n-octylphthalate | SVOA | | | | 13000 | UD | 13000 | 14 | U | 14 |
| Fluoranthene | SVOA | | | | 31000 | UD | 31000 | 3000 | X | 34 |
| Fluorene | SVOA | | | | 16000 | UD | 16000 | 1700 | | 17 |
| Hexachlorobenzene | SVOA | | | | 25000 | UD | 25000 | 27 | U | 27 |
| Hexachlorobutadiene | SVOA | | | | 8700 | UD | 8700 | 9.5 | U | 9.5 |
| Hexachlorocyclopentadiene | SVOA | | | | 44000 | UD | 44000 | 47 | UX | 47 |
| Hexachloroethane | SVOA | | | | 19000 | UD | 19000 | 20 | U | 20 |
| Indeno(1,2,3-cd)pyrene | SVOA | | | | 19000 | UD | 19000 | 300 | J | 21 |
| Isophorone | SVOA | | | | 15000 | UD | 15000 | 16 | U | 16 |
| Naphthalene | SVOA | | | | 27000 | UD | 27000 | 2800 | | 29 |
| Nitrobenzene | SVOA | | | | 19000 | UD | 19000 | 21 | U | 21 |
| N-Nitroso-di-n-dipropylamine | SVOA | | | | 27000 | UD | 27000 | 29 | U | 29 |
| N-Nitrosodiphenylamine | SVOA | | | | 18000 | UD | 18000 | 20 | U | 20 |
| Pentachlorophenol | SVOA | | | | 290000 | UD | 290000 | 310 | U | 310 |
| Phenanthrene | SVOA | | | | 15000 | UD | 15000 | 4800 | | 16 |
| Phenol | SVOA | | | | 16000 | UD | 16000 | 17 | U | 17 |
| Pyrene | SVOA | | | | 11000 | UD | 11000 | 2300 | | 11 |
| 1,1,1-Trichloroethane | VOA | | | | | | | 0.52 | U | 0.52 |
| 1,1,2,2-Tetrachloroethane | VOA | | | | | | | 0.61 | UX | 0.61 |
| 1,1,2-Trichloroethane | VOA | | | | | | | 0.88 | U | 0.88 |
| 1,1-Dichloroethane | VOA | | | | | | | 0.21 | U | 0.21 |
| 1,1-Dichloroethene | VOA | | | | | | | 0.59 | U | 0.59 |
| 1,2-Dichloroethane | VOA | | | | | | | 0.70 | U | 0.70 |
| 1,2-Dichloroethene(Total) | VOA | | | | | | | 0.39 | U | 0.39 |
| 1,2-Dichloropropane | VOA | | | | | | | 0.55 | U | 0.55 |
| 2-Butanone | VOA | | | | | | | 2.6 | J | 1.8 |
| 2-Hexanone | VOA | | | | | | | 4.9 | U | 4.9 |
| 4-Methyl-2-Pentanone | VOA | | | | | | | 4.4 | U | 4.4 |
| Acetone | VOA | | | | | | | 21 | | 5.4 |
| Benzene | VOA | | | | | | | 0.47 | U | 0.47 |
| Bromodichloromethane | VOA | | | | | | | 0.22 | U | 0.22 |
| Bromoform | VOA | | | | | | | 0.23 | U | 0.23 |
| Bromomethane | VOA | | | | | | | 0.50 | U | 0.50 |
| Carbon disulfide | VOA | | | | | | | 0.42 | U | 0.42 |
| Carbon tetrachloride | VOA | | | | | | | 0.63 | U | 0.63 |
| Chlorobenzene | VOA | | | | | | | 0.54 | UX | 0.54 |
| Chloroethane | VOA | | | | | | | 0.89 | U | 0.89 |
| Chloroform | VOA | | | | | | | 0.29 | U | 0.29 |
| Chloromethane | VOA | | | | | | | 0.77 | U | 0.77 |
| cis-1,3-Dichloropropene | VOA | | | | | | | 1.3 | U | 1.3 |
| Dibromochloromethane | VOA | | | | | | | 0.57 | U | 0.57 |
| Ethylbenzene | VOA | | | | | | | 1.7 | J | 0.67 |
| Methylenechloride | VOA | | | | | | | 2.4 | JBX | 1.6 |
| Styrene | VOA | | | | | | | 0.63 | UX | 0.63 |
| Tetrachloroethene | VOA | | | | | | | 0.59 | U | 0.59 |
| Toluene | VOA | | | | | | | 0.69 | U | 0.69 |
| trans-1,3-Dichloropropene | VOA | | | | | | | 0.67 | U | 0.67 |
| Trichloroethene | VOA | | | | | | | 0.23 | U | 0.23 |
| Vinyl chloride | VOA | | | | | | | 1.3 | U | 1.3 |
| Xylenes (total) | VOA | | | | | | | 2.9 | J | 0.61 |

# APPENDIX C

# CALCULATIONS

# APPENDIX C

## CALCULATION BRIEFS

The calculations provided in this appendix are copies of the originals that are kept in the active Washington Closure Hanford project files and are available upon request. When the project is completed, the files will be stored in a U.S. Department of Energy, Richland Operations Office repository. These calculations have 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:

*100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations,* 0100H-CA-V0230, Rev. 0, Washington Closure Hanford, Richland, Washington.

*100-H-28:2 and 100-H-42 Waste Sites Direct Contact Hazard Quotient, Carcinogenic Risk, and Sum of Fractions Calculations,* 0100H-CA-V0231, Rev. 0, Washington Closure Hanford, Richland, Washington.

*100-H-28:2 and 100-H-42 Waste Sites Hazard Quotient and Carcinogenic Risk Calculation for Protection of Groundwater*, 0100H-CA-V0232, 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.

Acrobat 8.0

# CALCULATION COVER SHEET

Project Title: 100-H Area Closure Operations **Job No. 14655**

Area: 100-H

Discipline: Environmental *Calculation No: 0100H-CA-V0230

Subject: 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculation

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<br>Sheets = 43<br>Attm. 1 = 56<br>Total = 100 | I. B. Berezovskiy | J. D. Skoglie | R. J. Nielson | S. G. Wilkinson | 7/14/15 |
| | | | | | | |
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## SUMMARY OF REVISION

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

***Washington Closure Hanford*** **CALCULATION SHEET**

| | | | | | |
|---|---|---|---|---|---|
| **Originator** I. B. Berezovskiy | **Date** 07/13/15 | **Calc. No.** 0100H-CA-V02301 | **Rev. No.** 0 |
| **Project** 100-H Area Closure Operations | **Job No.** 14655 | **Checked** J. D. Skoglie | **Date** 07/13/15 |
| **Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations | | | **Sheet No.** 1 of 43 |

**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 7 - Calculation Sheet Summary
Sheets 8 to 29 - Calculation Sheets Verification Data - Excavation 1, Excavation 2, Staging Pile Area, and Overburden.
Sheets 30 to 39 - Ecology Software (MTCAStat) Results
Sheets 40 to 43 - Calculation Sheet Duplicate Analysis
Attachment 1 - 100-H-28:2 and 100-H-42 Waste Sites Verification Sampling Results (56 sheets).

**Given/References:**
1) Sample Results (Attachment 1).
2) Background values and remedial action goals (RAGs) are taken from DOE-RL (2005b), DOE-RL (2001), and Ecology (1996).
3) DOE-RL, 2001, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, DOE/RL-92-24, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
4) DOE-RL, 2009a, *100 Area Remedial Action Sampling and Analysis Plan* (SAP), DOE/RL-96-22, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
5) DOE-RL, 2009b, *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP), DOE/RL-96-17, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
6) Ecology, 1992, *Statistical Guidance for Ecology Site Managers*, Publication #92-54, Washington Department of Ecology, Olympia, Washington.
7) 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 #92-64, Washington Department of Ecology, Olympia, Washington.
8) Ecology, 1996, *Model Toxic Control Act Cleanup Levels and Risk Calculations (CLARC II),* Publication #94-145, Washington State Department of Ecology, Olympia, Washington.
9) Ecology, 2014, Cleanup Levels and Risk Calculations (CLARC) Database, Washington State Department of Ecology, Olympia, Washington, <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.
10) WAC 173-340, 1996, "Model Toxic Control Act - Cleanup," *Washington Administrative Code.*

**Solution:**
Calculation methodology is described in Ecology (1992, 1993), below, and in the RDR/RAWP (DOE-RL 2009b). 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-H-28:2 and 100-H-42 waste sites. 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 2009b) is documented by this calculation. Duplicate RPD results are used in evaluation of data quality within the RSVP for this site.

**Methodology:**
The 100-H-28:2 and 100-H-42 waste sites underwent statistical sampling at four decision unit for verification sampling that included; excavation 1, excavation 2, staging pile area, and overburden pile. Seven focused samples were also included (three road crossing [RC] and four focused [FS] samples).

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.

**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 (2014) under WAC 173-340-740(3) for aluminum, calcium, iron, magnesium, potassium, silicon, and sodium; therefore, these constituents 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 occurence 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 2009b) 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 2009a) 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 discussion as necessary is provided in the data quality assessment section of the applicable RSVP.

***Washington Closure Hanford*** **CALCULATION SHEET**

| | | | | | |
|---|---|---|---|---|---|
| **Originator** I. B. Berezovskiy | **Date** 07/13/15 | **Calc. No.** 0100H-CA-V0230 | | **Rev. No.** 0 | |
| **Project** 100-H Area Closure Operations | **Job No.** 14655 | **Checked** J. D. Skoglie | | **Date** 07/13/15 | |
| **Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations | | | | **Sheet No.** 3 of 43 | |

**Summary (continued)**

**QUALIFIER LIST**

* = matrix spike exceeded the control limit.
B = estimated result. Result is less than the RL but greater than the MDL
C = the analyte was detected in both the sample and the associated QC blank, and the sample concentrations was ≤5X the blank concentration.
D = results are reported from a dilution
J = estimate
M = sample duplicate precision not met.
N = recovery exceeds upper or lower control limits
P = aroclor target analyte with greater than 25% difference between column analyses.
U = undetected
X (metals) = serial dilution in the analytical batch indicates that physical and chemical interferences are present
X (organics) = more than 40% difference between columns, lower result reported.
Y = more than 40% difference between columns, higher result reported.

**ACRONYM LIST**

-- = not applicable
DE = direct exposure
EXC1 = excavation 1
EXC2 = excavation 2
FS = focused sample
GW = groundwater
MDL = method detection limit
MTCA = *Model Toxics Control Act*
PQL = practical quantitation limit
Q = qualifier
QA/QC = quality assurance/quality control
OVB = overburden
RAG = remedial action goal
RC = road crossing
RDR/RAWP = remedial design report/remedial action work plan
RESRAD = RESidual RADioactivity (dose model)
RL = reporting limit
RPD = relative percent difference
RSVP = remaining sites verification package
SAP = sampling and analysis plan
SPA = staging pile area
TDL = target detection limit
UCL = upper confidence limit
WAC = Washington Administrative Code

*Washington Closure Hanford* **CALCULATION SHEET**

**Originator** I. B. Berezovskiy **Date** 07/13/15 **Calc. No.** 0100H-CA-V0230 **Rev. No.** 0
**Project** 100-H Area Closure Operations **Job No.** 14655 **Checked** J. D. Skoglie **Date** 07/13/15
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations **Sheet No.** 4 of 43

**Summary (continued)**

**Results:**
The results presented in the tables that follow include the summary of the results of the 95% UCL calculations for the excavaton 1, excavation 2, staging pile area, overburden, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations, and are for use in risk analysis and the RSVP for these sites.

**Results Summary (Page 1 of 3)** [a]

| Analyte | Excavation 1 | | Excavation 2 | | Staging Pile Area | | Overburden | | Focused Samples (FS and RC) | Units |
|---|---|---|---|---|---|---|---|---|---|---|
| | 95% UCL Result | Maximum Result | 95% UCL Result | Maximum Result | 95% UCL Result | Maximum Result | 95% UCL Result | Maximum Result | Maximum Result | |
| Cesium-137 | — | — | 0.00539 | — | 0.0844 | — | — | — | — | pCi/g |
| Europium-152 | — | — | 0.0151 | — | 0.0574 | — | — | — | — | pCi/g |
| Europium-155 | — | — | — | — | 0.0365 | — | — | — | — | pCi/g |
| Carbon-14 | — | — | — | — | 0.0910 | — | — | — | — | pCi/g |
| Nickel-63 | — | — | — | — | | — | — | — | 8.99 | pCi/g |
| Antimony | — | 0.51 | — | — | — | 0.50 | — | — | 0.40 | mg/kg |
| Arsenic | 6.7 | — | 4.1 | — | 15.2 | — | 8.6 | — | 7.3 | mg/kg |
| Barium | 79.7 | — | 55.9 | — | 78.2 | — | 55.6 | — | 88.0 | mg/kg |
| Beryllium | — | 0.85 | — | — | 0.28 | — | — | 0.16 | 0.27 | mg/kg |
| Boron | — | 25.7 | — | 1.0 | 3.2 | — | — | 1.5 | 3.6 | mg/kg |
| Cadmium | 0.12 | — | 0.095 | — | 0.22 | — | 0.12 | — | 0.25 | mg/kg |
| Chromium | 13.0 | — | 10.2 | — | 11.3 | — | 13.7 | — | 21.2 | mg/kg |
| Cobalt | 5.7 | — | 6.7 | — | 6.7 | — | 6.3 | — | 7.0 | mg/kg |
| Copper | 14.9 | — | 15.3 | — | 16.4 | — | 16.1 | — | 18.7 | mg/kg |
| Hexavalent chromium | — | 0.317 | — | 0.356 | — | 0.305 | 0.365 | — | 0.212 | mg/kg |
| Lead | 17.3 | — | 12.0 | — | 65.0 | — | 29.1 | — | 21.1 | mg/kg |
| Manganese | 232 | — | 257 | — | 307 | — | 270 | — | 313 | mg/kg |
| Mercury | 0.12 | — | — | 0.015 | 0.019 | — | 0.0070 | — | 4.9 | mg/kg |
| Molybdenum | — | 0.31 | — | — | — | 0.29 | — | — | — | mg/kg |
| Nickel | 14.1 | — | 10.4 | — | 12.0 | — | 11.2 | — | 17.9 | mg/kg |
| Silver | — | — | — | — | — | 0.14 | — | 0.22 | — | mg/kg |
| Vanadium | 36.4 | — | 47.0 | — | 43.3 | — | 42.1 | — | 37.4 | mg/kg |
| Zinc | 37.1 | — | 33.5 | — | 38.2 | — | 36.5 | — | 50.2 | mg/kg |

Continued on sheet 5.

***Washington Closure Hanford*** **CALCULATION SHEET**

**Originator** I. B. Berezovskiy **Date** 07/13/15 **Calc. No.** 0100H-CA-V0230 **Rev. No.** 0
**Project** 100-H Area Closure Operations **Job No.** 14655 **Checked** J. D. Skoglie **Date** 07/13/15
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations **Sheet No.** 5 of 43

**Summary (continued)**

**Results:**
The results presented in the tables that follow include the summary of the results of the 95% UCL calculations for the excavaton 1, excavation 2, staging pile area, overburden, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations, and are for use in risk analysis and the RSVP for these sites.

**Results Summary (Page 2 of 3)** [a]

| Analyte | Excavation 1 | | Excavation 2 | | Staging Pile Area | | Overburden | | Focused Samples (FS and RC) | Units |
|---|---|---|---|---|---|---|---|---|---|---|
| | 95% UCL Result | Maximum Result | 95% UCL Result | Maximum Result | 95% UCL Result | Maximum Result | 95% UCL Result | Maximum Result | Maximum Result | |
| Chloride | — | 30.1 | — | — | 9.9 | — | 12.6 | — | 12.1 | mg/kg |
| Fluoride | 1.1 | — | 0.86 | — | 1.8 | — | 1.2 | — | 1.9 | mg/kg |
| Nitrogen in nitrate | 1.2 | — | — | 2.1 | — | 15.2 | — | 2.6 | 3.9 | mg/kg |
| Nitrogen in nitrate and nitrite | — | 2.9 | — | 1.8 | — | 6.8 | 1.0 | — | 4.6 | mg/kg |
| Nitrogen in nitrite | — | — | — | — | — | — | — | 1.5 | — | mg/kg |
| Sulfate | 23 | — | 11.8 | — | 64.0 | — | 20.0 | — | 89.6 | mg/kg |
| TPH - Diesel EXT | 21 | — | — | 4.6 | 18 | — | 4.7 | — | 48 | mg/kg |
| TPH - Diesel | 9.1 | — | — | 3.1 | 7.3 | — | 2.7 | — | 21 | mg/kg |
| 4-4'-DDE | — | 0.0011 | — | 0.0050 | — | 0.0017 | — | 0.0010 | 0.00026 | mg/kg |
| 4-4'-DDT | — | 0.0029 | — | 0.00068 | — | 0.0027 | — | — | 0.00065 | mg/kg |
| Aroclor-1254 | — | 0.024 | — | — | — | 0.046 | — | — | 0.010 | mg/kg |
| Aroclor-1260 | — | 0.017 | — | — | — | 0.048 | — | — | 0.034 | mg/kg |
| Acenaphthene (Method 8270) | — | 0.018 | — | — | — | 0.011 | — | — | — | mg/kg |
| Acenaphthene (Method 8310) | — | 0.016 | — | — | — | 0.027 | — | 0.013 | 0.013 | mg/kg |
| Anthracene (Method 8310) | — | — | — | — | — | 0.026 | — | — | — | mg/kg |
| Benzo(a)anthracene (Method 8270) | — | 0.041 | — | 0.042 | — | 0.088 | — | 0.047 | 0.044 | mg/kg |
| Benzo(a)anthracene (Method 8310) | — | 0.032 | — | 0.016 | 0.018 | — | — | 0.037 | 0.024 | mg/kg |
| Benzo(a)pyrene (Method 8270) | — | 0.038 | — | 0.041 | — | 0.083 | — | 0.035 | 0.036 | mg/kg |
| Benzo(a)pyrene (Method 8310) | — | 0.047 | — | 0.026 | 0.021 | — | — | 0.033 | 0.027 | mg/kg |
| Benzo(b)fluoranthene (Method 8270) | — | 0.053 | — | 0.053 | — | 0.140 | — | 0.051 | 0.065 | mg/kg |
| Benzo(b)fluoranthene (Method 8310) | — | 0.037 | — | 0.028 | 0.021 | — | — | 0.032 | 0.026 | mg/kg |
| Benzo(ghi)perylene (Method 8270) | — | 0.031 | — | 0.029 | — | 0.053 | — | — | — | mg/kg |
| Benzo(ghi)perylene (Method 8310) | — | 0.043 | — | 0.025 | — | 0.041 | — | — | 0.008 | mg/kg |
| Benzo(k)fluoranthene (Method 8310) | — | 0.013 | — | 0.011 | — | 0.019 | — | 0.013 | 0.010 | mg/kg |
| Chrysene (Method 8270) | — | 0.041 | — | 0.045 | — | 0.100 | — | 0.049 | 0.040 | mg/kg |
| Chrysene (Method 8310) | — | 0.029 | — | 0.023 | — | 0.056 | — | 0.037 | 0.021 | mg/kg |

Continued on sheet 6.

*Washington Closure Hanford* **CALCULATION SHEET**

**Originator** I. B. Berezovskiy **Date** 07/13/15 **Calc. No.** 0100H-CA-V0230 **Rev. No.** 0
**Project** 100-H Area Closure Operations **Job No.** 14655 **Checked** J. D. Skoglie **Date** 07/13/15
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations **Sheet No.** 6 of 43

**Summary (continued)**

**Results:**
The results presented in the tables that follow include the summary of the results of the 95% UCL calculations for the excavaton 1, excavation 2, staging pile area, overburden, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations, and are for use in risk analysis and the RSVP for these sites.

**Results Summary (Page 3 of 3)** [a]

| Analyte | Excavation 1 | | Excavation 2 | | Staging Pile Area | | Overburden | | Focused Samples (FS and RC) | Units |
|---|---|---|---|---|---|---|---|---|---|---|
| | 95% UCL Result | Maximum Result | 95% UCL Result | Maximum Result | 95% UCL Result | Maximum Result | 95% UCL Result | Maximum Result | Maximum Result | |
| Dibenz[a,h]anthracene (Method 8310) | -- | -- | -- | -- | -- | 0.015 | -- | -- | -- | mg/kg |
| Dimethyl phthalate | -- | -- | -- | -- | -- | -- | -- | -- | 0.043 | mg/kg |
| Fluoranthene (Method 8270) | -- | 0.072 | -- | 0.078 | -- | 0.190 | -- | 0.077 | 0.081 | mg/kg |
| Fluoranthene (Method 8310) | -- | 0.078 | -- | 0.033 | 0.046 | -- | -- | 0.058 | 0.059 | mg/kg |
| Fluorene (Method 8270) | -- | 0.019 | -- | -- | -- | -- | -- | -- | -- | mg/kg |
| Fluorene (Method 8310) | -- | 0.012 | -- | -- | -- | 0.019 | -- | 0.028 | 0.012 | mg/kg |
| Indeno(1,2,3-cd)pyrene (Method 8270) | -- | -- | -- | -- | -- | 0.051 | -- | -- | -- | mg/kg |
| Indeno(1,2,3-cd)pyrene (Method 8310) | -- | 0.025 | -- | 0.021 | -- | 0.030 | -- | -- | 0.023 | mg/kg |
| Phenanthrene (Method 8270) | -- | 0.041 | -- | 0.044 | -- | 0.150 | -- | 0.046 | 0.047 | mg/kg |
| Phenanthrene (Method 8310) | -- | 0.070 | -- | 0.016 | -- | 0.130 | -- | 0.043 | 0.048 | mg/kg |
| Pyrene (Method 8270) | -- | 0.074 | -- | 0.071 | 0.059 | -- | 0.036 | -- | 0.068 | mg/kg |
| Pyrene (Method 8310) | -- | 0.082 | -- | 0.034 | 0.049 | -- | -- | 0.068 | 0.059 | mg/kg |
| 1,3-Dichlorobenzene | -- | 0.014 | -- | -- | -- | -- | -- | -- | -- | mg/kg |
| 1,4-Dichlorobenzene | -- | 0.014 | -- | -- | -- | -- | -- | -- | -- | mg/kg |
| 2,4,5-Trichlorophenol | -- | 0.016 | -- | -- | -- | -- | -- | -- | -- | mg/kg |
| 2,4,6-Trichlorophenol | -- | 0.013 | -- | -- | -- | -- | -- | -- | -- | mg/kg |
| 2-Chloronaphthalene | -- | 0.018 | -- | -- | -- | -- | -- | -- | -- | mg/kg |
| **3 Part Test Evaluation:** | | | | | | | | | | |
| 95% UCL or Maximum[a] > Cleanup Limit? | YES | YES | YES | YES | YES | YES | YES | YES | | |
| > 10% above Cleanup Limit? | YES | YES | YES | YES | YES | YES | YES | YES | | |
| Any sample > 2x Cleanup Limit? | YES | YES | NO | YES | YES | YES | YES | YES | | |

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

***Washington Closure Hanford*** **CALCULATION SHEET**

| | | | | | |
|---|---|---|---|---|---|
| **Originator** I. B. Berezovskiy | **Date** 07/13/15 | **Calc. No.** 0100H-CA-V0230 | | **Rev. No.** | 0 |
| **Project** 100-H Area Closure Operations | **Job No.** 14655 | **Checked** J. D. Skoglie | | **Date** | 07/13/15 |
| **Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations | | | | **Sheet No.** | 7 of 43 |

**Summary (continued)**

**Results:**
The results presented in the tables that follow include the summary of the results of the 95% UCL calculations for the excavaton 1, excavation 2, staging pile area, overburden, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations, and are for use in risk analysis and the RSVP for these sites.

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

| Analyte | Excavation 1 | Excavation 2 | Staging Pile Area | Overburden |
|---|---|---|---|---|
| | Duplicate Analysis | Duplicate Analysis | Duplicate Analysis | Duplicate Analysis |
| Potassium-40 | 0.6% | 5.8% | 7.1% | 10.6% |
| Aluminum | 6.6% | 0.4% | 3.3% | 4.8% |
| Barium | 7.8% | 6.3% | 0.3% | 3.2% |
| Calcium | 3.9% | 4.0% | 2.5% | 0.6% |
| Chromium | 2.5% | 10.5% | 4.9% | 9.6% |
| Copper | 0.0% | 11.8% | 0.9% | 3.9% |
| Iron | 1.9% | 5.4% | 11.6% | 5.6% |
| Magnesium | 5.0% | 3.5% | 4.0% | 8.7% |
| Manganese | 4.5% | 11.5% | 15.1% | 7.5% |
| Silicon | 6.7% | 11.6% | 16.0% | 18.7% |
| Sodium | 3.1% | -- | -- | -- |
| Vanadium | 1.6% | 11.1% | 14.5% | 4.0% |
| Zinc | 2.2% | 1.5% | 5.7% | 6.7% |

[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%, is addressed in the data quality assessment section of the RSVP.

**CALCULATION SHEET**

***Washington Closure Hanford***

**Originator** I. B. Berezovskiy **Date** 07/13/15 **Calc. No.** 0100H-CA-V0230 **Rev. No.** 0
**Project** 100-H Area Closure Operations **Job No.** 14655 **Checked** J. D. Skoglie **Date** 07/13/15
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations **Sheet No.** 8 of 43

**100-H-28:2 and 100-H-42 Waste Sites Statistical Calculations**

**Verification Data - Excavation 1**

| Sample Area | Sample Number | Sample Date | Arsenic mg/kg | Q | PQL | Barium mg/kg | Q | PQL | Cadmium mg/kg | Q | PQL | Chromium mg/kg | Q | PQL | Cobalt mg/kg | Q | PQL | Copper mg/kg | Q | PQL | Lead mg/kg | Q | PQL | Manganese mg/kg | Q | PQL | Mercury mg/kg | Q | PQL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EXC1-4 | J1V272 | 12/15/14 | 4.9 | J | 0.63 | 72.1 | | 0.073 | 0.120 | B | 0.039 | 16.2 | | 0.055 | 5.8 | X | 0.096 | 12.3 | | 0.21 | 6.3 | XJ | 0.26 | 227 | X | 0.096 | 0.029 | | 0.0057 |
| Duplicate of J1V272 | J1V285 | 12/15/14 | 5.2 | J | 0.64 | 66.7 | | 0.074 | 0.130 | B | 0.040 | 15.8 | | 0.056 | 5.7 | X | 0.097 | 12.3 | | 0.21 | 8.2 | XJ | 0.26 | 217 | X | 0.097 | 0.040 | | 0.0059 |
| EXC1-1 [a] | J1V543 | 3/16/15 | 5.3 | M | 0.58 | 160 | M | 0.067 | 0.075 | B | 0.036 | 10.2 | | 0.051 | 5.7 | X | 0.088 | 16.4 | | 0.21 | 11.7 | | 0.24 | 264 | | 0.088 | 0.0092 | B | 0.0064 |
| EXC1-2 | J1V270 | 12/15/14 | 5.4 | J | 0.67 | 60.4 | | 0.077 | 0.072 | B | 0.041 | 9.0 | | 0.058 | 5.6 | X | 0.10 | 11.8 | | 0.22 | 15.6 | XJ | 0.27 | 217 | X | 0.10 | 0.063 | | 0.0056 |
| EXC1-3 | J1V271 | 12/15/14 | 2.0 | J | 0.66 | 23.7 | | 0.076 | 0.041 | U | 0.041 | 6.4 | | 0.058 | 3.8 | X | 0.10 | 9.6 | | 0.22 | 1.7 | XJ | 0.27 | 160 | X | 0.10 | 0.0055 | U | 0.0055 |
| EXC1-5 | J1V273 | 12/15/14 | 1.9 | J | 0.62 | 35.5 | | 0.072 | 0.060 | B | 0.039 | 8.1 | | 0.055 | 4.9 | X | 0.095 | 11.1 | | 0.21 | 2.3 | XJ | 0.26 | 199 | X | 0.095 | 0.0055 | U | 0.0055 |
| EXC1-6 | J1V274 | 12/15/14 | 2.9 | J | 0.66 | 33.4 | | 0.076 | 0.085 | B | 0.041 | 11.9 | | 0.058 | 5.9 | X | 0.10 | 10.9 | | 0.22 | 2.7 | XJ | 0.27 | 195 | X | 0.10 | 0.0056 | U | 0.0056 |
| EXC1-7 | J1V275 | 12/15/14 | 2.1 | J | 0.64 | 37.7 | | 0.073 | 0.064 | B | 0.040 | 7.5 | | 0.056 | 4.4 | X | 0.096 | 9.3 | | 0.21 | 4.3 | XJ | 0.26 | 173 | X | 0.096 | 0.0056 | U | 0.0056 |
| EXC1-8 | J1V276 | 12/15/14 | 5.1 | J | 0.62 | 81.4 | | 0.072 | 0.200 | | 0.039 | 21.0 | | 0.055 | 6.5 | X | 0.095 | 21.2 | | 0.21 | 12.5 | XJ | 0.26 | 271 | X | 0.095 | 0.43 | | 0.0060 |
| EXC1-9 | J1V277 | 12/15/14 | 2.7 | J | 0.62 | 31.9 | | 0.071 | 0.052 | B | 0.038 | 7.0 | | 0.054 | 4.0 | X | 0.094 | 9.6 | | 0.20 | 5.4 | XJ | 0.25 | 167 | X | 0.094 | 0.0050 | U | 0.0050 |
| EXC1-10 | J1V278 | 12/15/14 | 9.4 | J | 0.65 | 54.0 | | 0.075 | 0.059 | B | 0.040 | 10.1 | | 0.057 | 5.3 | X | 0.098 | 11.0 | | 0.21 | 30.2 | XJ | 0.27 | 218 | X | 0.098 | 0.12 | | 0.0054 |
| EXC1-11 | J1V279 | 12/15/14 | 2.0 | J | 0.67 | 36.1 | | 0.077 | 0.085 | B | 0.042 | 7.2 | | 0.059 | 5.1 | X | 0.10 | 10.1 | | 0.22 | 4.7 | XJ | 0.27 | 189 | X | 0.10 | 0.013 | B | 0.0052 |
| EXC1-12 | J1V280 | 12/15/14 | 9.0 | J | 0.65 | 59.2 | | 0.075 | 0.046 | B | 0.041 | 11.5 | | 0.057 | 5.9 | X | 0.099 | 20.9 | | 0.21 | 4.1 | XJ | 0.27 | 253 | X | 0.099 | 0.0077 | B | 0.0056 |

**Statistical Computation Input Data**

| Sample Area | Sample Number | Sample Date | Arsenic mg/kg | Barium mg/kg | Cadmium mg/kg | Chromium mg/kg | Cobalt mg/kg | Copper mg/kg | Lead mg/kg | Manganese mg/kg | Mercury mg/kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EXC1-4 | J1V272/ J1V285 | 12/15/14 | 5.1 | 69 | 0.13 | 16.0 | 5.8 | 12.3 | 7.3 | 222 | 0.035 |
| EXC1-1 [a] | J1V543 | 3/16/15 | 5.3 | 160 | 0.075 | 10.2 | 5.7 | 16.4 | 11.7 | 264 | 0.0092 |
| EXC1-2 | J1V270 | 12/15/14 | 5.4 | 60.4 | 0.072 | 9.0 | 5.6 | 11.8 | 15.6 | 217 | 0.063 |
| EXC1-3 | J1V271 | 12/15/14 | 2.0 | 23.7 | 0.021 | 6.4 | 3.8 | 9.6 | 1.7 | 160 | 0.0028 |
| EXC1-5 | J1V273 | 12/15/14 | 1.9 | 35.5 | 0.060 | 8.1 | 4.9 | 11.1 | 2.3 | 199 | 0.0028 |
| EXC1-6 | J1V274 | 12/15/14 | 2.9 | 33.4 | 0.085 | 11.9 | 5.9 | 10.9 | 2.7 | 195 | 0.0028 |
| EXC1-7 | J1V275 | 12/15/14 | 2.1 | 37.7 | 0.064 | 7.5 | 4.4 | 9.3 | 4.3 | 173 | 0.0028 |
| EXC1-8 | J1V276 | 12/15/14 | 5.1 | 81.4 | 0.20 | 21.0 | 6.5 | 21.2 | 12.5 | 271 | 0.43 |
| EXC1-9 | J1V277 | 12/15/14 | 2.7 | 31.9 | 0.052 | 7.0 | 4.0 | 9.6 | 5.4 | 167 | 0.0025 |
| EXC1-10 | J1V278 | 12/15/14 | 9.4 | 54.0 | 0.059 | 10.1 | 5.3 | 11.0 | 30.2 | 218 | 0.12 |
| EXC1-11 | J1V279 | 12/15/14 | 2.0 | 36.1 | 0.085 | 7.2 | 5.1 | 10.1 | 4.7 | 189 | 0.013 |
| EXC1-12 | J1V280 | 12/15/14 | 9.0 | 59.2 | 0.046 | 11.5 | 5.9 | 20.9 | 4.1 | 253 | 0.0077 |

**Statistical Computations**

| | Arsenic | Barium | Cadmium | Chromium | Cobalt | Copper | Lead | Manganese | Mercury |
|---|---|---|---|---|---|---|---|---|---|
| 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), 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), 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), lognormal and normal distribution rejected, use z-statistic. |
| N | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| % < Detection limit | 0% | 0% | 8% | 0% | 0% | 0% | 0% | 0% | 42% |
| Mean | 4.4 | 56.9 | 0.079 | 10.5 | 5.2 | 12.9 | 8.5 | 211 | 0.058 |
| Standard deviation | 2.6 | 36.9 | 0.046 | 4.3 | 0.83 | 4.3 | 8.1 | 37.2 | 0.12 |
| 95% UCL on mean | 6.7 | 79.7 | 0.12 | 13.0 | 5.7 | 14.9 | 17.3 | 232 | 0.12 |
| Maximum value | 9.4 | 160 | 0.20 | 21.0 | 6.5 | 21.2 | 30.2 | 271 | 0.43 |
| **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)** | 20 DE, GW & River Protection | 200 GW Protection | 0.81 GW & River Protection | 18.5 GW & River Protection | 15.7 GW Protection | 22.0 River Protection | 10.2 GW & River Protection | 512 GW & River Protection | 0.33 GW & River Protection |
| **WAC 173-340 3-PART TEST** | | | | | | | | | |
| 95% UCL > Cleanup Limit? | NO | NO | NA | NO | NA | NA | YES | NA | NO |
| > 10% above Cleanup Limit? | NO | NO | NA | NO | NA | NA | YES | NA | NO |
| Any sample > 2X Cleanup Limit? | NO | NO | NA | NO | NA | NA | YES | NA | NO |
| **WAC 173-340 Compliance?** | 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. | 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. | 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. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | Because all values are below background (512 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. |

[a] These sample locations were re-sampled due to exceedances at one or more location. Sample data for the original sample locations (J1V269, J1V263, J1V267, and J1V266) are for information only.

**CALCULATION SHEET**

***Washington Closure Hanford***

**Originator** I. B. Berezovskiy **Date** 07/13/15 **Calc. No.** 0100H-CA-V0230 **Rev. No.** 0
**Project** 100-H Area Closure Operations **Job No.** 14655 **Checked** J. D. Skoglie **Date** 07/13/15
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations **Sheet No.** 9 of 43

1 **100-H-28:2 and 100-H-42 Waste Sites Statistical Calculations**
2 **Verification Data - Excavation 1**

| 3 | Sample | Sample | Sample | Nickel | | | Vanadium | | | Zinc | | | Fluoride | | | Nitrogen in Nitrate | | | Sulfate | | | TPH - Diesel EXT | | | TPH - Diesel | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 5 | EXC1-4 | J1V272 | 12/15/14 | 15.0 | X | 0.12 | 30.8 | | 0.090 | 41.4 | X | 0.38 | 1.6 | B | 0.89 | 0.88 | BJ | 0.34 | 13.2 | | 1.8 | 2900 | J | 1100 | 1300 | J | 730 |
| 6 | Duplicate of J1V272 | J1V285 | 12/15/14 | 14.6 | X | 0.12 | 31.3 | | 0.091 | 42.3 | X | 0.38 | 1.5 | B | 0.88 | 1.1 | BJ | 0.34 | 13.8 | | 1.8 | 3400 | J | 1000 | 1800 | J | 710 |
| 7 | EXC1-1 [a] | J1V543 | 3/16/15 | 12.8 | X | 0.11 | 43.5 | | 0.082 | 34.7 | | 0.35 | 1.3 | B | 0.82 | 3.1 | J | 0.31 | 13.4 | | 1.7 | 7400 | | 1000 | 4600 | | 700 |
| 8 | EXC1-2 | J1V270 | 12/15/14 | 9.2 | X | 0.12 | 39.0 | | 0.095 | 31.9 | X | 0.40 | 1.2 | B | 0.84 | 0.83 | BJ | 0.32 | 17.2 | | 1.7 | 78000 | NJ | 990 | 33000 | N | 680 |
| 9 | EXC1-3 | J1V271 | 12/15/14 | 7.4 | X | 0.12 | 25.4 | | 0.094 | 20.6 | X | 0.40 | 0.83 | U | 0.83 | 0.32 | UJ | 0.32 | 8.2 | | 1.7 | 1200 | J | 1000 | 690 | J | 690 |
| 10 | EXC1-5 | J1V273 | 12/15/14 | 7.3 | X | 0.12 | 34.0 | | 0.089 | 27.2 | X | 0.38 | 0.81 | U | 0.81 | 0.31 | UJ | 0.31 | 7.9 | | 1.7 | 3000 | J | 1000 | 2200 | J | 680 |
| 11 | EXC1-6 | J1V274 | 12/15/14 | 22.2 | X | 0.12 | 34.3 | | 0.094 | 26.0 | X | 0.40 | 0.84 | B | 0.81 | 0.71 | BJ | 0.31 | 8.9 | | 1.7 | 2500 | J | 980 | 1500 | J | 670 |
| 12 | EXC1-7 | J1V275 | 12/15/14 | 6.8 | X | 0.12 | 30.3 | | 0.091 | 22.4 | X | 0.38 | 0.82 | U | 0.82 | 0.76 | BJ | 0.32 | 7.8 | | 1.7 | 1500 | J | 940 | 800 | J | 640 |
| 13 | EXC1-8 | J1V276 | 12/15/14 | 17.2 | X | 0.12 | 33.8 | | 0.089 | 48.7 | X | 0.38 | 1.4 | B | 0.89 | 1.2 | BJ | 0.34 | 17.9 | | 1.8 | 7300 | J | 1100 | 3400 | J | 730 |
| 14 | EXC1-9 | J1V277 | 12/15/14 | 8.6 | X | 0.12 | 28.6 | | 0.088 | 20.4 | X | 0.37 | 0.87 | B | 0.84 | 0.32 | UJ | 0.32 | 18.9 | | 1.7 | 8300 | J | 970 | 3000 | J | 660 |
| 15 | EXC1-10 | J1V278 | 12/15/14 | 9.9 | X | 0.12 | 30.6 | | 0.092 | 30.7 | X | 0.39 | 0.95 | B | 0.90 | 0.34 | UJ | 0.34 | 14.8 | | 1.9 | 6300 | J | 1100 | 2500 | J | 730 |
| 16 | EXC1-11 | J1V279 | 12/15/14 | 8.2 | X | 0.12 | 37.1 | | 0.095 | 25.6 | X | 0.40 | 0.83 | U | 0.83 | 0.70 | BJ | 0.32 | 10.1 | | 1.7 | 2300 | J | 1000 | 1600 | J | 680 |
| 17 | EXC1-12 | J1V280 | 12/15/14 | 10.9 | X | 0.12 | 35.9 | | 0.093 | 44.2 | X | 0.39 | 0.83 | U | 0.83 | 1.1 | BJ | 0.32 | 58.7 | | 1.7 | 7700 | J | 1000 | 4000 | J | 690 |

18 **Statistical Computation Input Data**

| 19 | Sample | Sample | Sample | Nickel | Vanadium | Zinc | Fluoride | Nitrogen in Nitrate | Sulfate | TPH - Diesel EXT | TPH - Diesel |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | Area | Number | Date | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | ug/kg | ug/kg |
| 21 | EXC1-4 | J1V272/ J1V285 | 12/15/14 | 14.8 | 31.1 | 41.9 | 1.6 | 0.99 | 13.5 | 3150 | 1550 |
| 22 | EXC1-1 [a] | J1V543 | 3/16/15 | 12.8 | 43.5 | 34.7 | 1.3 | 3.1 | 13.4 | 7400 | 4600 |
| 23 | EXC1-2 | J1V270 | 12/15/14 | 9.2 | 39.0 | 31.9 | 1.2 | 0.83 | 17.2 | 78000 | 33000 |
| 24 | EXC1-3 | J1V271 | 12/15/14 | 7.4 | 25.4 | 20.6 | 0.42 | 0.16 | 8.2 | 1200 | 690 |
| 25 | EXC1-5 | J1V273 | 12/15/14 | 7.3 | 34.0 | 27.2 | 0.41 | 0.16 | 7.9 | 3000 | 2200 |
| 26 | EXC1-6 | J1V274 | 12/15/14 | 22.2 | 34.3 | 26.0 | 0.84 | 0.71 | 8.9 | 2500 | 1500 |
| 27 | EXC1-7 | J1V275 | 12/15/14 | 6.8 | 30.3 | 22.4 | 0.41 | 0.76 | 7.8 | 1500 | 800 |
| 28 | EXC1-8 | J1V276 | 12/15/14 | 17.2 | 33.8 | 48.7 | 1.4 | 1.2 | 17.9 | 7300 | 3400 |
| 29 | EXC1-9 | J1V277 | 12/15/14 | 8.6 | 28.6 | 20.4 | 0.87 | 0.16 | 18.9 | 8300 | 3000 |
| 30 | EXC1-10 | J1V278 | 12/15/14 | 9.9 | 30.6 | 30.7 | 0.95 | 0.17 | 14.8 | 6300 | 2500 |
| 31 | EXC1-11 | J1V279 | 12/15/14 | 8.2 | 37.1 | 25.6 | 0.42 | 0.70 | 10.1 | 2300 | 1600 |
| 32 | EXC1-12 | J1V280 | 12/15/14 | 10.9 | 35.9 | 44.2 | 0.42 | 1.1 | 58.7 | 7700 | 4000 |

33 **Statistical Computations**

| 34 | | Nickel | Vanadium | Zinc | Fluoride | Nitrogen in Nitrate | Sulfate | TPH - Diesel EXT | TPH - Diesel |
|---|---|---|---|---|---|---|---|---|---|
| 35 | 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), lognormal and normal distribution rejected, use z-statistic. | Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic. | Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic. | Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic. | Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic. |
| 36 | N | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| 37 | % < Detection limit | 0% | 0% | 0% | 42% | 33% | 0% | 0% | 0% |
| 38 | Mean | 11.3 | 33.6 | 31.2 | 0.85 | 0.84 | 16.4 | 10721 | 4903 |
| 39 | Standard deviation | 4.7 | 4.9 | 9.5 | 0.44 | 0.81 | 13.9 | 21352 | 8932 |
| 40 | 95% UCL on mean | 14.1 | 36.4 | 37.1 | 1.1 | 1.2 | 23 | 20860 | 9145 |
| 41 | Maximum value | 22.2 | 43.5 | 48.7 | 1.6 | 3.1 | 58.7 | 78000 | 33000 |
| 42 | **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise** | 19.1 GW Protection | 85.1 GW Protection | 67.8 River Protection | 96 GW Protection | 1,000 GW Protection | 25,000 GW Protection | 200,000 ug/kg DE, GW & River Protection | 200,000 ug/kg DE, GW & River Protection |
| 43 | **WAC 173-340 3-PART TEST** | | | | | | | | |
| 44 | 95% UCL > Cleanup Limit? | NO | NA | NA | NA | NA | NA | NO | NO |
| 45 | > 10% above Cleanup Limit? | NO | NA | NA | NA | NA | NA | NO | NO |
| 46 | Any sample > 2X Cleanup Limit? | NO | NA | NA | NA | NA | NA | NO | NO |
| 47 | **WAC 173-340 Compliance?** | The data set meets the 3-part test criteria when compared to the most stringent RAG. | 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. | Because all values are below background (2.81 mg/kg) the WAC 173-340 3-part test is not required. | Because all values are below background (11.8 mg/kg) the WAC 173-340 3-part test is not required. | Because all values are below background (237 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. |

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**MAXIMUM VALUE 3-PART TEST CALCULATION SHEET**

*Washington Closure Hanford*
Originator I. B. Berezovskiy
Project 100-H Area Closure Operations
Subject 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

Date 07/13/15
Job No. 14655

Calc. No. 0100H-CA-V0230
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/15
Sheet No. 10 of 43

1 **100-H-28:2 and 100-H-42 Waste Sites Maximum Calculations**
2 **Verification Data - Excavation 1**

| 3 | | | | Antimony | | | Beryllium | | | Boron | | | Hexavalent Chromium | | | Molybdenum | | | Chloride | | | Nitrogen in Nitrite and Nitrate | | | 4,4-DDE | | | 4,4-DDT | | | Aroclor-1254 | | | Aroclor-1260 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Sample Area | Sample Number | Sample 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 | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 5 | EXC1-4 | J1V272 | 12/15/14 | 0.36 | UJ | 0.36 | 0.055 | B | 0.032 | 0.94 | U | 0.94 | 0.155 | U | 0.155 | 0.25 | U | 0.25 | 2.2 | U | 2.2 | 0.39 | U | 0.39 | 0.26 | U | 0.26 | 0.74 | J | 0.63 | 15 | | 2.6 | 2.6 | U | 2.6 |
| 6 | Duplicate of J1V272 | J1V285 | 12/15/14 | 0.37 | UJ | 0.37 | 0.040 | B | 0.032 | 0.95 | U | 0.95 | 0.204 | | 0.155 | 0.25 | U | 0.25 | 2.2 | U | 2.2 | 0.38 | U | 0.38 | 0.26 | U | 0.26 | 1.1 | J | 0.64 | 24 | | 2.6 | 2.6 | U | 2.6 |
| 7 | EXC1-1 [a] | J1V543 | 3/16/15 | 0.51 | B | 0.33 | 0.85 | | 0.029 | 25.7 | MN | 0.86 | 0.155 | U | 0.155 | 0.31 | B | 0.23 | 30.1 | C | 2.0 | 2.9 | | 0.37 | 0.24 | U | 0.24 | 0.60 | U | 0.60 | 2.6 | U | 2.6 | 2.6 | U | 2.6 |
| 8 | EXC1-2 | J1V270 | 12/15/14 | 0.38 | UJ | 0.38 | 0.033 | U | 0.033 | 1.2 | B | 0.99 | 0.266 | | 0.155 | 0.26 | U | 0.26 | 2.0 | U | 2.0 | 0.37 | U | 0.37 | 0.93 | JY | 0.25 | 2.9 | | 0.62 | 2.7 | U | 2.7 | 15 | | 2.7 |
| 9 | EXC1-3 | J1V271 | 12/15/14 | 0.38 | UJ | 0.38 | 0.033 | U | 0.033 | 0.98 | U | 0.98 | 0.155 | U | 0.155 | 0.26 | U | 0.26 | 2.0 | U | 2.0 | 0.36 | U | 0.36 | 0.24 | U | 0.24 | 0.59 | U | 0.59 | 2.6 | U | 2.6 | 2.6 | U | 2.6 |
| 10 | EXC1-5 | J1V273 | 12/15/14 | 0.36 | UJ | 0.36 | 0.031 | U | 0.031 | 0.93 | U | 0.93 | 0.155 | U | 0.155 | 0.25 | U | 0.25 | 2.0 | U | 2.0 | 0.37 | U | 0.37 | 0.24 | U | 0.24 | 0.60 | U | 0.60 | 2.7 | U | 2.7 | 2.7 | U | 2.7 |
| 11 | EXC1-6 | J1V274 | 12/15/14 | 0.38 | UJ | 0.38 | 0.033 | U | 0.033 | 0.98 | U | 0.98 | 0.155 | U | 0.155 | 0.26 | U | 0.26 | 2.0 | U | 2.0 | 0.37 | U | 0.37 | 1.1 | J | 0.24 | 1.6 | J | 0.59 | 2.6 | U | 2.6 | 2.6 | U | 2.6 |
| 12 | EXC1-7 | J1V275 | 12/15/14 | 0.37 | UJ | 0.37 | 0.032 | U | 0.032 | 0.95 | U | 0.95 | 0.155 | U | 0.155 | 0.25 | U | 0.25 | 2.0 | U | 2.0 | 0.37 | U | 0.37 | 0.24 | U | 0.24 | 0.60 | U | 0.60 | 2.6 | U | 2.6 | 2.6 | U | 2.6 |
| 13 | EXC1-8 | J1V276 | 12/15/14 | 0.36 | UJ | 0.36 | 0.086 | B | 0.031 | 1.1 | B | 0.93 | 0.317 | | 0.155 | 0.25 | U | 0.25 | 2.2 | U | 2.2 | 0.39 | U | 0.39 | 0.26 | U | 0.26 | 0.64 | U | 0.64 | 2.8 | U | 2.8 | 17 | | 2.8 |
| 14 | EXC1-9 | J1V277 | 12/15/14 | 0.36 | UJ | 0.36 | 0.031 | U | 0.031 | 0.92 | U | 0.92 | 0.155 | U | 0.155 | 0.24 | U | 0.24 | 2.0 | U | 2.0 | 0.37 | U | 0.37 | 0.24 | U | 0.24 | 0.60 | U | 0.60 | 2.7 | U | 2.7 | 2.7 | U | 2.7 |
| 15 | EXC1-10 | J1V278 | 12/15/14 | 0.37 | UJ | 0.37 | 0.032 | U | 0.032 | 1.0 | B | 0.96 | 0.213 | | 0.155 | 0.26 | U | 0.26 | 2.2 | U | 2.2 | 0.40 | U | 0.40 | 0.26 | U | 0.26 | 0.65 | U | 0.65 | 2.7 | U | 2.7 | 2.7 | U | 2.7 |
| 16 | EXC1-11 | J1V279 | 12/15/14 | 0.38 | UJ | 0.38 | 0.033 | U | 0.033 | 0.99 | U | 0.99 | 0.155 | U | 0.155 | 0.26 | U | 0.26 | 2.0 | U | 2.0 | 0.36 | U | 0.36 | 0.24 | U | 0.24 | 0.59 | U | 0.59 | 2.6 | U | 2.6 | 14 | | 2.6 |
| 17 | EXC1-12 | J1V280 | 12/15/14 | 0.39 | BJ | 0.38 | 0.033 | U | 0.033 | 2.0 | | 0.97 | 0.201 | | 0.155 | 0.30 | B | 0.26 | 2.0 | U | 2.0 | 0.63 | B | 0.37 | 0.24 | U | 0.24 | 0.59 | U | 0.59 | 2.7 | U | 2.7 | 2.7 | U | 2.7 |

18 **3-Part Test Evaluations**

| 19 | | Antimony | Beryllium | Boron | Hexavalent Chromium | Molybdenum | Chloride | Nitrogen in Nitrite and Nitrate | 4,4-DDE | 4,4-DDT | Aroclor-1254 | Aroclor-1260 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | % < Detection limit | 83% | 75% | 58% | 58% | 83% | 92% | 83% | 83% | 75% | 92% | 75% |
| 21 | Maximum value | 0.51 | 0.85 | 25.7 | 0.317 | 0.31 | 30.1 | 2.9 | 1.1 | 2.9 | 24 | 17 |
| 22 | **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise** | 5 GW & River Protection | 1.51 GW & River Protection | 320 GW Protection | 2 River Protection | 8 GW Protection | 25000 GW Protection | 1000 GW Protection | 3.3 ug/kg River Protection | 3.3 ug/kg River Protection | 17 ug/kg GW & River Protection | 17 ug/kg GW & River Protection |
| 23 | **3-PART TEST** | | | | | | | | | | | |
| 24 | Maximum > Cleanup Limit? | NA | NA | NO | NO | NO | NO | NO | NO | NO | YES | NO |
| 25 | > 10% above Cleanup Limit? | NA | NA | NO | NO | NO | NO | NO | NO | NO | NO | NO |
| 26 | Any sample > 2X Cleanup Limit? | NA | NA | NO | NO | NO | NO | NO | NO | NO | NO | NO |
| 27 | **3-Part Test Compliance?** | Because all values are below background (5 mg/kg) the 3-part test is not required. | Because all values are below background (1.51 mg/kg) the 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. | Because all values are below background (100 mg/kg) the 3-part test is not required. | Because all values are below background (11.8 mg/kg) the 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. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | The data set meets the 3-part test criteria when compared to the most stringent RAG. |

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29 **100-H-28:2 and 100-H-42 Waste Sites Maximum Calculations**
30 **Verification Data - Excavation 1**

| 31 | | | | Acenaphthene (Method 8270) | | | Acenaphthene (Method 8310) | | | Benzo(a)anthracene (Method 8270) | | | Benzo(a)anthracene (Method 8310) | | | Benzo(a)pyrene (Method 8270) | | | Benzo(a)pyrene (Method 8310) | | | Benzo(b)fluoranthene (Method 8270) | | | Benzo(b)fluoranthene (Method 8310) | | | Benzo(ghi)perylene (Method 8270) | | | Benzo(ghi)perylene (Method 8310) | | | Benzo(k)fluoranthene (Method 8310) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | Sample Area | Sample Number | Sample Date | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 33 | EXC1-4 | J1V272 | 12/15/14 | 11 | U | 11 | 11 | U | 11 | 21 | U | 21 | 3.4 | U | 3.4 | 21 | U | 21 | 6.8 | U | 6.8 | 28 | U | 28 | 4.4 | U | 4.4 | 17 | U | 17 | 7.6 | U | 7.6 | 4.2 | U | 4.2 |
| 34 | Duplicate of J1V272 | J1V285 | 12/15/14 | 11 | U | 11 | 11 | U | 11 | 21 | U | 21 | 3.4 | U | 3.4 | 21 | U | 21 | 6.8 | U | 6.8 | 28 | U | 28 | 4.4 | U | 4.4 | 17 | U | 17 | 7.6 | U | 7.6 | 4.2 | U | 4.2 |
| 35 | EXC1-1 [a] | J1V543 | 3/16/15 | 11 | U | 11 | 10 | U | 10 | 21 | U | 21 | 3.3 | U | 3.3 | 21 | U | 21 | 6.6 | U | 6.6 | 27 | U | 27 | 5.4 | J | 4.3 | 16 | U | 16 | 7.4 | U | 7.4 | 4.1 | U | 4.1 |
| 36 | EXC1-2 | J1V270 | 12/15/14 | 11 | U | 11 | 10 | U | 10 | 41 | J | 21 | 15 | JX | 3.3 | 38 | J | 21 | 47 | X | 6.7 | 53 | J | 27 | 37 | X | 4.4 | 31 | J | 17 | 43 | X | 7.6 | 11 | J | 4.1 |
| 37 | EXC1-3 | J1V271 | 12/15/14 | 10 | U | 10 | 10 | U | 10 | 20 | U | 20 | 3.2 | U | 3.2 | 20 | U | 20 | 6.4 | U | 6.4 | 26 | U | 26 | 4.2 | U | 4.2 | 16 | U | 16 | 7.2 | U | 7.2 | 3.9 | U | 3.9 |
| 38 | EXC1-5 | J1V273 | 12/15/14 | 10 | U | 10 | 9.9 | U | 9.9 | 20 | U | 20 | 24 | | 3.2 | 20 | U | 20 | 30 | | 6.3 | 28 | J | 26 | 34 | X | 4.2 | 16 | J | 16 | 17 | JX | 7.1 | 13 | J | 3.9 |
| 39 | EXC1-6 | J1V274 | 12/15/14 | 9.9 | U | 9.9 | 9.5 | U | 9.5 | 19 | U | 19 | 3.0 | U | 3.0 | 19 | U | 19 | 6.1 | U | 6.1 | 25 | U | 25 | 4.0 | U | 4.0 | 15 | U | 15 | 6.8 | U | 6.8 | 3.7 | U | 3.7 |
| 40 | EXC1-7 | J1V275 | 12/15/14 | 10 | U | 10 | 16 | J | 9.9 | 20 | U | 20 | 32 | | 3.1 | 20 | U | 20 | 28 | | 6.3 | 26 | U | 26 | 32 | | 4.1 | 16 | U | 16 | 29 | J | 7.1 | 9.6 | J | 3.9 |
| 41 | EXC1-8 | J1V276 | 12/15/14 | 11 | U | 11 | 11 | U | 11 | 22 | U | 22 | 3.5 | U | 3.5 | 22 | U | 22 | 7.0 | U | 7.0 | 29 | U | 29 | 4.6 | U | 4.6 | 18 | U | 18 | 7.8 | U | 7.8 | 4.3 | U | 4.3 |
| 42 | EXC1-9 | J1V277 | 12/15/14 | 18 | J | 10 | 10 | U | 10 | 20 | J | 20 | 3.2 | U | 3.2 | 20 | U | 20 | 6.4 | U | 6.4 | 26 | U | 26 | 4.2 | U | 4.2 | 16 | U | 16 | 7.2 | U | 7.2 | 3.9 | U | 3.9 |
| 43 | EXC1-10 | J1V278 | 12/15/14 | 11 | U | 11 | 11 | U | 11 | 22 | U | 22 | 3.5 | U | 3.5 | 22 | U | 22 | 7.0 | U | 7.0 | 28 | U | 28 | 4.6 | U | 4.6 | 17 | U | 17 | 7.9 | U | 7.9 | 4.3 | U | 4.3 |
| 44 | EXC1-11 | J1V279 | 12/15/14 | 10 | U | 10 | 9.8 | U | 9.8 | 20 | U | 20 | 3.1 | U | 3.1 | 20 | U | 20 | 6.3 | U | 6.3 | 26 | U | 26 | 4.1 | U | 4.1 | 16 | U | 16 | 7.1 | U | 7.1 | 3.9 | U | 3.9 |
| 45 | EXC1-12 | J1V280 | 12/15/14 | 11 | U | 11 | 10 | U | 10 | 21 | U | 21 | 3.3 | U | 3.3 | 21 | U | 21 | 6.6 | U | 6.6 | 27 | U | 27 | 4.3 | U | 4.3 | 17 | U | 17 | 7.4 | U | 7.4 | 4.1 | U | 4.1 |

46 **3-Part Test Evaluations**

| 47 | | Acenaphthene (Method 8270) | Acenaphthene (Method 8310) | Benzo(a)anthracene (Method 8270) | Benzo(a)anthracene (Method 8310) | Benzo(a)pyrene (Method 8270) | Benzo(a)pyrene (Method 8310) | Benzo(b)fluoranthene (Method 8270) | Benzo(b)fluoranthene (Method 8310) | Benzo(ghi)perylene (Method 8270) | Benzo(ghi)perylene (Method 8310) | Benzo(k)fluoranthene (Method 8310) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 48 | % < Detection limit | 92% | 92% | 83% | 75% | 92% | 75% | 83% | 67% | 83% | 75% | 75% |
| 49 | Maximum value | 18 | 16 | 41 | 32 | 38 | 47 | 53 | 37 | 31 | 43 | 13 |
| 50 | **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise** | 96,000 ug/kg GW Protection | 96,000 ug/kg GW Protection | 15 ug/kg GW & River Protection | 15 ug/kg GW & River Protection | 15 ug/kg GW & River Protection | 15 ug/kg GW & River Protection | 15 ug/kg GW & River Protection | 15 ug/kg GW & River Protection | 48,000 ug/kg GW Protection | 48,000 ug/kg GW Protection | 15 ug/kg GW & River Protection |
| 51 | **3-PART TEST** | | | | | | | | | | | |
| 52 | Maximum > Cleanup Limit? | NO | NO | YES | YES | YES | YES | YES | YES | NO | NO | NO |
| 53 | > 10% above Cleanup Limit? | NO | NO | YES | YES | YES | YES | YES | YES | NO | NO | NO |
| 54 | Any sample > 2X Cleanup Limit? | NO | NO | YES | NO | YES | YES | YES | YES | NO | NO | NO |
| 55 | **3-Part Test Compliance?** | 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. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure 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. |

**MAXIMUM VALUE 3-PART TEST CALCULATION SHEET**

*Washington Closure Hanford*
Originator I. B. Berezovskiy
Project 100-H Area Closure Operations
Subject 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

Date 07/13/15
Job No. 14655

Calc. No. 0100H-CA-V0230
Checked J. D. Skoglie

Rev. No. 0
Date 07/13/15
Sheet No. 11 of 43

**100-H-28:2 and 100-H-42 Waste Sites Maximum Calculations**
**Verification Data - Excavation 1**

| Sample Area | Sample Number | Sample Date | Chrysene (Method 8270) | | | Chrysene (Method 8310) | | | Fluoranthene (Method 8270) | | | Fluoranthene (Method 8310) | | | Fluorene (Method 8270) | | | Fluorene (Method 8310) | | | Indeno(1,2,3-cd) pyrene (Method 8310) | | | Phenanthrene (Method 8270) | | | Phenanthrene (Method 8310) | | | Pyrene (Method 8270) | | | Pyrene (Method 8310) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| EXC1-4 | J1V272 | 12/15/14 | 29 | U | 29 | 5.1 | U | 5.1 | 38 | U | 38 | 14 | U | 14 | 19 | U | 19 | 5.6 | U | 5.6 | 13 | U | 13 | 18 | U | 18 | 13 | U | 13 | 13 | U | 13 | 13 | U | 13 |
| Duplicate of J1V272 | J1V285 | 12/15/14 | 29 | U | 29 | 5.1 | U | 5.1 | 38 | U | 38 | 14 | U | 14 | 19 | U | 19 | 5.6 | U | 5.6 | 13 | U | 13 | 18 | U | 18 | 13 | U | 13 | 13 | U | 13 | 13 | U | 13 |
| EXC1-1 [a] | J1V543 | 3/16/15 | 28 | U | 28 | 7.5 | J | 5.0 | 37 | U | 37 | 13 | U | 13 | 19 | U | 19 | 5.4 | U | 5.4 | 12 | U | 12 | 17 | U | 17 | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 |
| EXC1-2 | J1V270 | 12/15/14 | 41 | J | 28 | 29 | JX | 5.1 | 72 | J | 37 | 63 | | 14 | 19 | U | 19 | 5.5 | U | 5.5 | 13 | U | 13 | 41 | J | 18 | 38 | J | 13 | 74 | J | 13 | 61 | | 13 |
| EXC1-3 | J1V271 | 12/15/14 | 27 | U | 27 | 4.8 | U | 4.8 | 36 | U | 36 | 13 | U | 13 | 18 | U | 18 | 5.3 | U | 5.3 | 12 | U | 12 | 17 | U | 17 | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 |
| EXC1-5 | J1V273 | 12/15/14 | 27 | U | 27 | 18 | JX | 4.8 | 36 | J | 36 | 48 | | 13 | 18 | U | 18 | 5.2 | U | 5.2 | 25 | J | 12 | 17 | U | 17 | 16 | J | 12 | 35 | J | 12 | 49 | | 12 |
| EXC1-6 | J1V274 | 12/15/14 | 26 | U | 26 | 4.6 | U | 4.6 | 34 | U | 34 | 12 | U | 12 | 17 | U | 17 | 5.0 | U | 5.0 | 11 | U | 11 | 16 | U | 16 | 11 | U | 11 | 12 | U | 12 | 11 | U | 11 |
| EXC1-7 | J1V275 | 12/15/14 | 26 | U | 26 | 29 | JX | 4.8 | 35 | U | 35 | 78 | | 13 | 18 | U | 18 | 12 | J | 5.2 | 21 | J | 12 | 17 | U | 17 | 70 | | 12 | 12 | U | 12 | 82 | | 12 |
| EXC1-8 | J1V276 | 12/15/14 | 30 | U | 30 | 5.3 | U | 5.3 | 39 | U | 39 | 14 | U | 14 | 20 | U | 20 | 5.7 | U | 5.7 | 13 | U | 13 | 29 | J | 19 | 13 | U | 13 | 25 | J | 13 | 13 | U | 13 |
| EXC1-9 | J1V277 | 12/15/14 | 27 | U | 27 | 4.8 | U | 4.8 | 36 | U | 36 | 13 | U | 13 | 19 | J | 18 | 5.3 | U | 5.3 | 12 | U | 12 | 20 | J | 17 | 12 | U | 12 | 17 | J | 12 | 12 | U | 12 |
| EXC1-10 | J1V278 | 12/15/14 | 29 | U | 29 | 5.3 | U | 5.3 | 39 | U | 39 | 14 | U | 14 | 19 | U | 19 | 5.8 | U | 5.8 | 13 | U | 13 | 18 | U | 18 | 13 | U | 13 | 13 | J | 13 | 13 | U | 13 |
| EXC1-11 | J1V279 | 12/15/14 | 27 | U | 27 | 4.8 | U | 4.8 | 36 | U | 36 | 13 | U | 13 | 18 | U | 18 | 5.2 | U | 5.2 | 12 | U | 12 | 17 | U | 17 | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 |
| EXC1-12 | J1V280 | 12/15/14 | 28 | U | 28 | 5.0 | U | 5.0 | 37 | U | 37 | 13 | U | 13 | 19 | U | 19 | 5.5 | U | 5.5 | 12 | U | 12 | 18 | U | 18 | 12 | U | 12 | 13 | U | 13 | 12 | U | 12 |

**3-Part Test Evaluations**

| | Chrysene (Method 8270) | | | Chrysene (Method 8310) | | | Fluoranthene (Method 8270) | | | Fluoranthene (Method 8310) | | | Fluorene (Method 8270) | | | Fluorene (Method 8310) | | | Indeno(1,2,3-cd) pyrene (Method 8310) | | | Phenanthrene (Method 8270) | | | Phenanthrene (Method 8310) | | | Pyrene (Method 8270) | | | Pyrene (Method 8310) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % < Detection limit | 92% | | | 67% | | | 83% | | | 75% | | | 92% | | | 92% | | | 83% | | | 75% | | | 75% | | | 58% | | | 75% | | |
| Maximum value | 41 | | | 29 | | | 72 | | | 78 | | | 19 | | | 12 | | | 25 | | | 41 | | | 70 | | | 74 | | | 82 | | |
| **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise** | 100 ug/kg | River Protection | | 100 ug/kg | River Protection | | 18,000 ug/kg | River Protection | | 18,000 ug/kg | River Protection | | 64,000 ug/kg | GW Protection | | 64,000 ug/kg | GW Protection | | 330 ug/kg | GW & River Protection | | 240,000 ug/kg | GW Protection | | 240,000 ug/kg | GW Protection | | 48,000 ug/kg | GW Protection | | 48,000 ug/kg | GW Protection | |
| **3-PART TEST** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Maximum > Cleanup Limit? | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | |
| > 10% above Cleanup Limit? | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | |
| Any sample > 2X Cleanup Limit? | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | | NO | | |
| **3-Part Test Compliance?** | 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. | | | 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. | | | 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. | | |

**100-H-28:2 and 100-H-42 Waste Sites Maximum Calculations**
**Verification Data - Excavation 1**

| Sample Area | Sample Number | Sample Date | 1,3-Dichlorobenzene (Method 8270) | | | 1,4-Dichloronbezene (Method 8270) | | | 2,4,5-Trichlorophenol (Method 8270) | | | 2,4,6- Trichlorophenol (Method 8270) | | | 2-Chloronaphthalene (Method 8270) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| EXC1-4 | J1V272 | 12/15/14 | 13 | U | 13 | 15 | U | 15 | 11 | U | 11 | 11 | U | 11 | 11 | U | 11 |
| Duplicate of J1V272 | J1V285 | 12/15/14 | 13 | U | 13 | 14 | U | 14 | 11 | U | 11 | 11 | U | 11 | 11 | U | 11 |
| EXC1-1 [a] | J1V543 | 3/16/15 | 12 | U | 12 | 14 | U | 14 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| EXC1-2 | J1V270 | 12/15/14 | 12 | U | 12 | 14 | U | 14 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| EXC1-3 | J1V271 | 12/15/14 | 12 | U | 12 | 13 | U | 13 | 9.9 | U | 9.9 | 9.9 | U | 9.9 | 9.9 | U | 9.9 |
| EXC1-5 | J1V273 | 12/15/14 | 12 | U | 12 | 14 | U | 14 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| EXC1-6 | J1V274 | 12/15/14 | 11 | U | 11 | 13 | U | 13 | 9.6 | U | 9.6 | 9.6 | U | 9.6 | 9.6 | U | 9.6 |
| EXC1-7 | J1V275 | 12/15/14 | 12 | U | 12 | 13 | U | 13 | 9.8 | U | 9.8 | 9.8 | U | 9.8 | 9.8 | U | 9.8 |
| EXC1-8 | J1V276 | 12/15/14 | 13 | U | 13 | 15 | U | 15 | 11 | U | 11 | 11 | U | 11 | 11 | U | 11 |
| EXC1-9 | J1V277 | 12/15/14 | 14 | J | 12 | 14 | J | 14 | 16 | J | 10 | 13 | J | 10 | 18 | J | 10 |
| EXC1-10 | J1V278 | 12/15/14 | 13 | U | 13 | 15 | U | 15 | 11 | U | 11 | 11 | U | 11 | 11 | U | 11 |
| EXC1-11 | J1V279 | 12/15/14 | 12 | U | 12 | 14 | U | 14 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| EXC1-12 | J1V280 | 12/15/14 | 12 | U | 12 | 14 | U | 14 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |

**3-Part Test Evaluations**

| | 1,3-Dichlorobenzene (Method 8270) | | | 1,4-Dichloronbezene (Method 8270) | | | 2,4,5-Trichlorophenol (Method 8270) | | | 2,4,6- Trichlorophenol (Method 8270) | | | 2-Chloronaphthalene (Method 8270) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % < Detection limit | 92% | | | 92% | | | 92% | | | 92% | | | 92% | | |
| Maximum value | 14 | | | 14 | | | 16 | | | 13 | | | 18 | | |
| **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise** | 24,000 ug/kg | GWProtection | | 330 ug/kg | GW Protection | | 80,000 ug/kg | GW Protection | | 420 ug/kg | River Protection | | 64,000 ug/kg | GW Protection | |
| **3-PART TEST** | | | | | | | | | | | | | | | |
| Maximum > Cleanup Limit? | NO | | | NO | | | NO | | | NO | | | NO | | |
| > 10% above Cleanup Limit? | NO | | | NO | | | NO | | | NO | | | NO | | |
| Any sample > 2X Cleanup Limit? | NO | | | NO | | | NO | | | NO | | | NO | | |
| **3-Part Test Compliance?** | 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. | | | The data set meets the 3-part test criteria when compared to the most stringent RAG. | | |

**CALCULATION SHEET**

*Washington Closure Hanford*

**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 12 of 43

**100-H-28:2 and 100-H-42 Waste Sites Statistical Calculations**
**Verification Data - Excavation 2**

| Sample Area | Sample Number | Sample Date | Cesium-137 pCi/g | Cesium-137 Q | Cesium-137 MDA | Europium-152 pCi/g | Europium-152 Q | Europium-152 MDA |
|---|---|---|---|---|---|---|---|---|
| EXC2-7 | J1V292 | 12/12/14 | 0.00330 | U | 0.0216 | -0.0193 | U | 0.0442 |
| Duplicate of J1V292 | J1V298 | 12/12/14 | -0.00513 | U | 0.0184 | 0.0533 | | 0.0378 |
| EXC2-1 | J1V286 | 12/12/14 | -0.00686 | U | 0.0318 | -0.0504 | U | 0.0781 |
| EXC2-2 | J1V287 | 12/12/14 | 0.00604 | U | 0.0290 | 0.0709 | U | 0.0820 |
| EXC2-3 | J1V288 | 12/12/14 | 0.00416 | U | 0.0272 | 0.00847 | U | 0.0644 |
| EXC2-4 | J1V289 | 12/12/14 | -0.0132 | U | 0.0184 | 0.00132 | U | 0.0447 |
| EXC2-5 | J1V290 | 12/12/14 | -0.0107 | U | 0.0178 | -0.000905 | U | 0.0376 |
| EXC2-6 | J1V291 | 12/12/14 | -0.0104 | U | 0.0200 | 0.0160 | U | 0.0454 |
| EXC2-8 | J1V293 | 12/12/14 | 0.00404 | U | 0.0356 | -0.0578 | U | 0.0869 |
| EXC2-9 | J1V294 | 12/12/14 | 0.00103 | U | 0.0275 | -0.0478 | U | 0.0775 |
| EXC2-10 | J1V295 | 12/12/14 | -0.000211 | U | 0.0244 | 0.00996 | U | 0.0543 |
| EXC2-11 | J1V296 | 12/12/14 | -0.00777 | U | 0.0218 | 0.0146 | U | 0.0591 |
| EXC2-12 | J1V297 | 12/12/14 | 0.0315 | | 0.0232 | -0.00443 | U | 0.0448 |

**Statistical Computation Input Data**

| Sample Area | Sample Number | Sample Date | Cesium-137 pCi/g | | | Europium-152 pCi/g | | |
|---|---|---|---|---|---|---|---|---|
| EXC2-7 | J1V292/ J1V289 | 12/12/14 | -0.000915 | | | 0.0170 | | |
| EXC2-1 | J1V286 | 12/12/14 | -0.00686 | | | -0.0504 | | |
| EXC2-2 | J1V287 | 12/12/14 | 0.00604 | | | 0.0709 | | |
| EXC2-3 | J1V288 | 12/12/14 | 0.00416 | | | 0.00847 | | |
| EXC2-4 | J1V289 | 12/12/14 | -0.0132 | | | 0.00132 | | |
| EXC2-5 | J1V290 | 12/12/14 | -0.0107 | | | -0.000905 | | |
| EXC2-6 | J1V291 | 12/12/14 | -0.0104 | | | 0.0160 | | |
| EXC2-8 | J1V293 | 12/12/14 | 0.00404 | | | -0.0578 | | |
| EXC2-9 | J1V294 | 12/12/14 | 0.00103 | | | -0.0478 | | |
| EXC2-10 | J1V295 | 12/12/14 | -0.000211 | | | 0.0100 | | |
| EXC2-11 | J1V296 | 12/12/14 | -0.00777 | | | 0.0146 | | |
| EXC2-12 | J1V297 | 12/12/14 | 0.0315 | | | -0.00443 | | |

**Statistical Computations**

| | Cesium-137 | | | Europium-152 | | |
|---|---|---|---|---|---|---|
| 95% UCL based on | Radionuclide data set. Use nonparametric z-statistic. | | | Radionuclide data set. Use nonparametric z-statistic. | | |
| N | 12 | | | 12 | | |
| % < Detection limit | 92% | | | 92% | | |
| Mean | -0.000274 | | | -0.00192 | | |
| Standard deviation | 0.0119 | | | 0.0358 | | |
| Z-statistic | 1.64 | | | 1.64 | | |
| 95% UCL on mean | 0.00539 | | | 0.0151 | | |
| Maximum value | 0.0315 | | | 0.0533 | | |

**CALCULATION SHEET**

*Washington Closure Hanford*

**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 13 of 43

1 **100-H-28:2 and 100-H-42 Waste Sites Statistical Calculations**
2 **Verification Data - Excavation 2**

| 3 | Sample | Sample | Sample | Arsenic | | | Barium | | | Cadmium | | | Chromium | | | Cobalt | | | Copper | | | Lead | | | Manganese | | | Nickel | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | mg/kg | Q | PQL |
| 5 | EXC2-7 | J1V292 | 12/12/14 | 3.4 | | 0.68 | 54.1 | | 0.078 | 0.11 | B | 0.042 | 9.0 | | 0.060 | 6.5 | | 0.10 | 14.4 | | 0.22 | 9.4 | | 0.28 | 238 | | 0.10 | 10.4 | | 0.13 |
| 6 | Duplicate of J1V292 | J1V298 | 12/12/14 | 4.0 | | 0.66 | 57.6 | | 0.076 | 0.097 | B | 0.041 | 8.1 | | 0.058 | 6.0 | | 0.10 | 12.8 | | 0.22 | 9.7 | | 0.27 | 267 | | 0.10 | 10.0 | | 0.12 |
| 7 | EXC2-1 | J1V286 | 12/12/14 | 1.9 | | 0.66 | 38.1 | | 0.076 | 0.11 | BM | 0.041 | 9.3 | | 0.058 | 5.5 | | 0.10 | 12.2 | | 0.22 | 2.6 | | 0.27 | 212 | | 0.10 | 9.7 | | 0.12 |
| 8 | EXC2-2 | J1V287 | 12/12/14 | 2.5 | | 0.59 | 65.1 | | 0.068 | 0.081 | B | 0.037 | 7.0 | | 0.052 | 6.7 | | 0.089 | 17.4 | | 0.19 | 2.2 | | 0.24 | 286 | | 0.089 | 7.6 | | 0.11 |
| 9 | EXC2-3 | J1V288 | 12/12/14 | 4.2 | | 0.64 | 43.2 | | 0.074 | 0.069 | B | 0.040 | 8.7 | | 0.057 | 5.7 | | 0.10 | 10.8 | | 0.21 | 10.2 | | 0.26 | 219 | | 0.097 | 8.8 | | 0.12 |
| 10 | EXC2-4 | J1V289 | 12/12/14 | 1.7 | | 0.65 | 51.5 | | 0.074 | 0.11 | B | 0.040 | 6.6 | | 0.057 | 6.8 | | 0.10 | 13.6 | | 0.21 | 2.2 | | 0.26 | 217 | | 0.098 | 6.5 | | 0.12 |
| 11 | EXC2-5 | J1V290 | 12/12/14 | 2.7 | | 0.66 | 46.0 | | 0.077 | 0.052 | B | 0.041 | 13.2 | | 0.058 | 6.6 | | 0.10 | 20.1 | | 0.22 | 2.9 | | 0.27 | 312 | | 0.10 | 11.0 | | 0.12 |
| 12 | EXC2-6 | J1V291 | 12/12/14 | 3.1 | | 0.63 | 67.0 | | 0.073 | 0.10 | B | 0.039 | 12.3 | | 0.055 | 7.6 | | 0.10 | 16.1 | | 0.21 | 8.2 | | 0.26 | 264 | | 0.096 | 13.6 | | 0.12 |
| 13 | EXC2-8 | J1V293 | 12/12/14 | 2.3 | | 0.69 | 47.8 | | 0.079 | 0.073 | B | 0.043 | 9.7 | | 0.060 | 6.2 | | 0.10 | 12.8 | | 0.23 | 3.9 | | 0.28 | 241 | | 0.10 | 10.1 | | 0.13 |
| 14 | EXC2-9 | J1V294 | 12/12/14 | 6.5 | | 0.65 | 43.3 | | 0.075 | 0.067 | B | 0.040 | 8.5 | | 0.057 | 5.7 | | 0.10 | 11.9 | | 0.21 | 18.0 | | 0.27 | 223 | | 0.098 | 10.2 | | 0.12 |
| 15 | EXC2-10 | J1V295 | 12/12/14 | 1.2 | | 0.62 | 54.2 | | 0.072 | 0.084 | B | 0.039 | 4.4 | | 0.055 | 7.0 | | 0.094 | 12.4 | | 0.20 | 2.0 | | 0.25 | 211 | | 0.094 | 6.0 | | 0.12 |
| 16 | EXC2-11 | J1V296 | 12/12/14 | 2.1 | | 0.58 | 54.2 | | 0.067 | 0.080 | B | 0.036 | 5.3 | | 0.051 | 6.9 | | 0.088 | 13.4 | | 0.19 | 3.2 | | 0.24 | 228 | | 0.088 | 8.1 | | 0.11 |
| 17 | EXC2-12 | J1V297 | 12/12/14 | 4.3 | | 0.64 | 41.9 | | 0.073 | 0.064 | B | 0.040 | 7.8 | | 0.056 | 5.2 | | 0.10 | 11.1 | | 0.21 | 12.3 | | 0.26 | 192 | | 0.097 | 7.3 | | 0.12 |

18 **Statistical Computation Input Data**

| 19 | Sample | Sample | Sample | Arsenic | Barium | Cadmium | Chromium | Cobalt | Copper | Lead | Manganese | Nickel |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | Area | Number | Date | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| 21 | EXC2-7 | J1V292/ J1V289 | 12/12/14 | 3.7 | 55.9 | 0.10 | 8.6 | 6.3 | 13.6 | 9.6 | 253 | 10.2 |
| 22 | EXC2-1 | J1V286 | 12/12/14 | 1.9 | 38.1 | 0.11 | 9.3 | 5.5 | 12.2 | 2.6 | 212 | 9.7 |
| 23 | EXC2-2 | J1V287 | 12/12/14 | 2.5 | 65.1 | 0.081 | 7.0 | 6.7 | 17.4 | 2.2 | 286 | 7.6 |
| 24 | EXC2-3 | J1V288 | 12/12/14 | 4.2 | 43.2 | 0.069 | 8.7 | 5.7 | 10.8 | 10.2 | 219 | 8.8 |
| 25 | EXC2-4 | J1V289 | 12/12/14 | 1.7 | 51.5 | 0.11 | 6.6 | 6.8 | 13.6 | 2.2 | 217 | 6.5 |
| 26 | EXC2-5 | J1V290 | 12/12/14 | 2.7 | 46.0 | 0.052 | 13.2 | 6.6 | 20.1 | 2.9 | 312 | 11.0 |
| 27 | EXC2-6 | J1V291 | 12/12/14 | 3.1 | 67.0 | 0.10 | 12.3 | 7.6 | 16.1 | 8.2 | 264 | 13.6 |
| 28 | EXC2-8 | J1V293 | 12/12/14 | 2.3 | 47.8 | 0.073 | 9.7 | 6.2 | 12.8 | 3.9 | 241 | 10.1 |
| 29 | EXC2-9 | J1V294 | 12/12/14 | 6.5 | 43.3 | 0.067 | 8.5 | 5.7 | 11.9 | 18.0 | 223 | 10.2 |
| 30 | EXC2-10 | J1V295 | 12/12/14 | 1.2 | 54.2 | 0.084 | 4.4 | 7.0 | 12.4 | 2.0 | 211 | 6.0 |
| 31 | EXC2-11 | J1V296 | 12/12/14 | 2.1 | 54.2 | 0.080 | 5.3 | 6.9 | 13.4 | 3.2 | 228 | 8.1 |
| 32 | EXC2-12 | J1V297 | 12/12/14 | 4.3 | 41.9 | 0.064 | 7.8 | 5.2 | 11.1 | 12.3 | 192 | 7.3 |

33 **Statistical Computations**

| 34 | | Arsenic | Barium | Cadmium | Chromium | Cobalt | Copper | Lead | Manganese | Nickel |
|---|---|---|---|---|---|---|---|---|---|---|
| 35 | 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), 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. | Large data set (n ≥ 10), use MTCAStat lognormal distribution. | Large data set (n ≥ 10), use MTCAStat lognormal distribution. |
| 36 | N | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| 37 | % < Detection limit | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 38 | Mean | 3.0 | 50.7 | 0.083 | 8.4 | 6.3 | 13.8 | 6.4 | 238 | 9.1 |
| 39 | Standard deviation | 1.5 | 9.1 | 0.019 | 2.6 | 0.71 | 2.8 | 5.2 | 34.8 | 2.1 |
| 40 | 95% UCL on mean | 4.1 | 55.9 | 0.095 | 10.2 | 6.7 | 15.3 | 12.0 | 257 | 10.4 |
| 41 | Maximum value | 6.5 | 67.0 | 0.11 | 13.2 | 7.6 | 20.1 | 18.0 | 312 | 13.6 |
| 42 | **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)** | 20 DE, GW & River Protection | 200 GW Protection | 0.81 GW & River Protection | 18.5 GW & River Protection | 15.7 GW Protection | 22.0 River Protection | 10.2 GW & River Protection | 512 GW & River Protection | 19.1 GW Protection |
| 43 | **WAC 173-340 3-PART TEST** | | | | | | | | | |
| 44 | 95% UCL > Cleanup Limit? | NA | NA | NA | NA | NA | NA | YES | NA | NA |
| 45 | > 10% above Cleanup Limit? | NA | NA | NA | NA | NA | NA | YES | NA | NA |
| 46 | Any sample > 2X Cleanup Limit? | NA | NA | NA | NA | NA | NA | NO | NA | NA |
| 47 | **WAC 173-340 Compliance?** | Because all values are at or 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 (0.81 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. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required. | Because all values are below background (19.1 mg/kg) the WAC 173-340 3-part test is not required. |

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**CALCULATION SHEET**

***Washington Closure Hanford***

**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 14 of 43

1 **100-H-28:2 and 100-H-42 Waste Sites Statistical Calculations**
2 **Verification Data - Excavation 2**

| 3 | Sample | Sample | Sample | Vanadium | | | Zinc | | | Fluoride | | | Sulfate | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Area | Number | Date | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| 5 | EXC2-7 | J1V292 | 12/12/14 | 43.9 | | 0.097 | 34.1 | | 0.41 | 1.0 | B | 0.84 | 9.6 | | 1.7 |
| 6 | Duplicate of J1V292 | J1V298 | 12/12/14 | 39.3 | | 0.094 | 33.6 | | 0.40 | 1.1 | B | 0.81 | 8.6 | | 1.7 |
| 7 | EXC2-1 | J1V286 | 12/12/14 | 40.1 | | 0.094 | 28.5 | | 0.40 | 0.80 | U | 0.80 | 6.9 | | 1.7 |
| 8 | EXC2-2 | J1V287 | 12/12/14 | 33.3 | | 0.084 | 29.8 | | 0.35 | 0.79 | U | 0.79 | 6.3 | | 1.6 |
| 9 | EXC2-3 | J1V288 | 12/12/14 | 34.2 | | 0.092 | 30.6 | | 0.39 | 1.1 | B | 0.79 | 23.9 | | 1.6 |
| 10 | EXC2-4 | J1V289 | 12/12/14 | 59.2 | | 0.092 | 34.4 | | 0.39 | 0.78 | U | 0.78 | 6.6 | | 1.6 |
| 11 | EXC2-5 | J1V290 | 12/12/14 | 41.8 | | 0.095 | 32.3 | | 0.40 | 0.81 | U | 0.81 | 7.2 | | 1.7 |
| 12 | EXC2-6 | J1V291 | 12/12/14 | 48.6 | | 0.090 | 38.8 | | 0.38 | 0.92 | B | 0.86 | 11.3 | | 1.8 |
| 13 | EXC2-8 | J1V293 | 12/12/14 | 40.2 | | 0.098 | 31.5 | | 0.41 | 0.87 | B | 0.84 | 8.6 | | 1.7 |
| 14 | EXC2-9 | J1V294 | 12/12/14 | 36.6 | | 0.093 | 32.0 | | 0.39 | 1.1 | B | 0.85 | 10.2 | | 1.8 |
| 15 | EXC2-10 | J1V295 | 12/12/14 | 49.7 | | 0.089 | 32.5 | | 0.38 | 0.80 | U | 0.80 | 6.9 | | 1.7 |
| 16 | EXC2-11 | J1V296 | 12/12/14 | 50.2 | | 0.083 | 31.1 | | 0.35 | 0.82 | U | 0.82 | 7.8 | | 1.7 |
| 17 | EXC2-12 | J1V297 | 12/12/14 | 32.8 | | 0.091 | 29.7 | | 0.38 | 1.0 | B | 0.86 | 9.2 | | 1.8 |

18 **Statistical Computation Input Data**

| 19 | Sample | Sample | Sample | Vanadium | | | Zinc | | | Fluoride | | | Sulfate | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | Area | Number | Date | mg/kg | | | mg/kg | | | mg/kg | | | mg/kg | | |
| 21 | EXC2-7 | J1V292/ J1V289 | 12/12/14 | 41.6 | | | 33.9 | | | 1.1 | | | 9.1 | | |
| 22 | EXC2-1 | J1V286 | 12/12/14 | 40.1 | | | 28.5 | | | 0.40 | | | 6.9 | | |
| 23 | EXC2-2 | J1V287 | 12/12/14 | 33.3 | | | 29.8 | | | 0.40 | | | 6.3 | | |
| 24 | EXC2-3 | J1V288 | 12/12/14 | 34.2 | | | 30.6 | | | 1.1 | | | 23.9 | | |
| 25 | EXC2-4 | J1V289 | 12/12/14 | 59.2 | | | 34.4 | | | 0.39 | | | 6.6 | | |
| 26 | EXC2-5 | J1V290 | 12/12/14 | 41.8 | | | 32.3 | | | 0.41 | | | 7.2 | | |
| 27 | EXC2-6 | J1V291 | 12/12/14 | 48.6 | | | 38.8 | | | 0.92 | | | 11.3 | | |
| 28 | EXC2-8 | J1V293 | 12/12/14 | 40.2 | | | 31.5 | | | 0.87 | | | 8.6 | | |
| 29 | EXC2-9 | J1V294 | 12/12/14 | 36.6 | | | 32.0 | | | 1.1 | | | 10.2 | | |
| 30 | EXC2-10 | J1V295 | 12/12/14 | 49.7 | | | 32.5 | | | 0.40 | | | 6.9 | | |
| 31 | EXC2-11 | J1V296 | 12/12/14 | 50.2 | | | 31.1 | | | 0.41 | | | 7.8 | | |
| 32 | EXC2-12 | J1V297 | 12/12/14 | 32.8 | | | 29.7 | | | 1.0 | | | 9.2 | | |

33 **Statistical Computations**

| 34 | | Vanadium | | | Zinc | | | Fluoride | | | Sulfate | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35 | 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), lognormal and normal distribution rejected, use z-statistic. | | |
| 36 | N | 12 | | | 12 | | | 12 | | | 12 | | |
| 37 | % < Detection limit | 0% | | | 0% | | | 50% | | | 0% | | |
| 38 | Mean | 42.4 | | | 32.1 | | | 0.70 | | | 9.5 | | |
| 39 | Standard deviation | 8.1 | | | 2.7 | | | 0.32 | | | 4.8 | | |
| 40 | 95% UCL on mean | 47.0 | | | 33.5 | | | 0.86 | | | 11.8 | | |
| 41 | Maximum value | 59.2 | | | 38.8 | | | 1.1 | | | 23.9 | | |
| 42 | **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)** | 85.1 | | GW Protection | 67.8 | | River Protection | 96 | | GW Protection | 25,000 | | GW Protection |
| 43 | **WAC 173-340 3-PART TEST** | | | | | | | | | | | | |
| 44 | 95% UCL > Cleanup Limit? | NA | | | NA | | | NA | | | NA | | |
| 45 | > 10% above Cleanup Limit? | NA | | | NA | | | NA | | | NA | | |
| 46 | Any sample > 2X Cleanup Limit? | NA | | | NA | | | NA | | | NA | | |
| 47 | **WAC 173-340 Compliance?** | 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. | | | Because all values are below background (2.81 mg/kg) the WAC 173-340 3-part test is not required. | | | Because all values are below background (237 mg/kg) the WAC 173-340 3-part test is not required. | | |

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**MAXIMUM VALUE 3-PART TEST CALCULATION SHEET**

***Washington Closure Hanford***
**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 15 of 43

**100-H-28:2 and 100-H-42 Waste Sites Maximum Calculations**
**Verification Data - Excavation 2**

| Sample Area | Sample Number | Sample Date | Boron | | | Hexavalent Chromium | | | Mercury | | | Nitrogen in Nitrate | | | Nitrogen in Nitrite and Nitrate | | | TPH - Diesel EXT. | | | TPH - Diesel | | | 4,4-DDE | | | 4,4-DDT | | | Benzo(a)anthracene (Method 8270) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| EXC2-7 | J1V292 | 12/12/14 | 1.0 | U | 1.0 | 0.155 | U | 0.155 | 0.0051 | U | 0.0051 | 0.85 | BJ | 0.32 | 0.36 | B | 0.36 | 1900 | J | 1000 | 970 | J | 700 | 1.1 | J | 0.25 | 0.61 | U | 0.61 | 20 | U | 20 |
| Duplicate of J1V292 | J1V298 | 12/12/14 | 0.98 | U | 0.98 | 0.155 | U | 0.155 | 0.0093 | B | 0.0057 | 0.86 | BJ | 0.31 | 0.37 | U | 0.37 | 1300 | J | 1000 | 680 | U | 680 | 1.6 | J | 0.25 | 0.61 | U | 0.61 | 21 | U | 21 |
| EXC2-1 | J1V286 | 12/12/14 | 0.98 | U | 0.98 | 0.155 | U | 0.155 | 0.0055 | U | 0.0055 | 0.31 | UR | 0.31 | 0.36 | U | 0.36 | 1000 | U | 1000 | 690 | U | 690 | 0.24 | U | 0.24 | 0.59 | U | 0.59 | 20 | U | 20 |
| EXC2-2 | J1V287 | 12/12/14 | 0.87 | U | 0.87 | 0.155 | U | 0.155 | 0.0053 | U | 0.0053 | 0.30 | UR | 0.30 | 0.37 | U | 0.37 | 1000 | U | 1000 | 700 | U | 700 | 0.25 | U | 0.25 | 0.61 | U | 0.61 | 20 | U | 20 |
| EXC2-3 | J1V288 | 12/12/14 | 1.0 | B | 0.95 | 0.155 | U | 0.155 | 0.0055 | U | 0.0055 | 2.1 | BJ | 0.30 | 1.8 | | 0.37 | 4600 | | 1000 | 3100 | J | 680 | 0.24 | U | 0.24 | 0.59 | U | 0.59 | 20 | U | 20 |
| EXC2-4 | J1V289 | 12/12/14 | 0.96 | U | 0.96 | 0.169 | | 0.155 | 0.0054 | U | 0.0054 | 1.3 | BJ | 0.30 | 0.77 | | 0.36 | 950 | U | 950 | 640 | U | 640 | 0.24 | U | 0.24 | 0.59 | U | 0.59 | 20 | U | 20 |
| EXC2-5 | J1V290 | 12/12/14 | 0.99 | U | 0.99 | 0.214 | | 0.155 | 0.0150 | B | 0.0055 | 0.31 | UR | 0.31 | 0.37 | U | 0.37 | 950 | U | 950 | 650 | U | 650 | 0.24 | U | 0.24 | 0.60 | U | 0.60 | 20 | U | 20 |
| EXC2-6 | J1V291 | 12/12/14 | 0.94 | U | 0.94 | 0.356 | | 0.155 | 0.0058 | U | 0.0058 | 0.97 | BJ | 0.33 | 0.38 | U | 0.38 | 2500 | J | 1000 | 1900 | J | 700 | 0.25 | U | 0.25 | 0.62 | U | 0.62 | 21 | U | 21 |
| EXC2-8 | J1V293 | 12/12/14 | 1.0 | U | 1.0 | 0.155 | U | 0.155 | 0.0057 | U | 0.0057 | 0.76 | BJ | 0.32 | 0.36 | U | 0.36 | 990 | U | 990 | 670 | U | 670 | 0.24 | U | 0.24 | 0.61 | U | 0.61 | 20 | U | 20 |
| EXC2-9 | J1V294 | 12/12/14 | 0.97 | U | 0.97 | 0.314 | | 0.155 | 0.0051 | U | 0.0051 | 0.88 | BJ | 0.33 | 0.42 | B | 0.37 | 2900 | J | 1000 | 1900 | J | 690 | 0.24 | U | 0.24 | 0.61 | U | 0.61 | 21 | U | 21 |
| EXC2-10 | J1V295 | 12/12/14 | 0.92 | U | 0.92 | 0.191 | | 0.155 | 0.0053 | B | 0.0052 | 0.63 | BJ | 0.30 | 0.36 | U | 0.36 | 930 | U | 930 | 630 | U | 630 | 0.24 | U | 0.24 | 0.60 | U | 0.60 | 20 | U | 20 |
| EXC2-11 | J1V296 | 12/12/14 | 0.87 | U | 0.87 | 0.155 | U | 0.155 | 0.0051 | U | 0.0051 | 0.72 | BJ | 0.32 | 0.36 | U | 0.36 | 950 | U | 950 | 640 | U | 640 | 0.24 | U | 0.24 | 0.59 | U | 0.59 | 20 | U | 20 |
| EXC2-12 | J1V297 | 12/12/14 | 0.95 | U | 0.95 | 0.155 | U | 0.155 | 0.0055 | U | 0.0055 | 1.4 | BJ | 0.33 | 0.95 | | 0.37 | 3200 | JN | 1000 | 1100 | JN | 690 | 5.0 | | 0.24 | 0.68 | JX | 0.60 | 42 | J | 21 |

**3-Part Test Evaluations**

| | Boron | | Hexavalent Chromium | | Mercury | | Nitrogen in Nitrate | | Nitrogen in Nitrite and Nitrate | | TPH - Diesel EXT. | | TPH - Diesel | | 4,4-DDE | | 4,4-DDT | | Benzo(a)anthracene (Method 8270) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % < Detection limit | 92% | | 58% | | 75% | | 0% | | 58% | | 58% | | 58% | | 83% | | 92% | | 92% | |
| Maximum value | 1.0 | | 0.356 | | 0.015 | | 2.1 | | 1.8 | | 4600 | | 3100 | | 5.0 | | 0.68 | | 42 | |
| **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise** | 320 | GW Protection | 2 | River Protection | 0.33 | GW & River Protection | 1,000 | GW Protection | 1,000 | GW Protection | 200,000 ug/kg | GW & River Protection | 200,000 ug/kg | GW & River Protection | 3.3 ug/kg | River Protection | 3.3 ug/kg | River Protection | 15 ug/kg | GW & River Protection |
| **3-PART TEST** | | | | | | | | | | | | | | | | | | | | |
| Maximum > Cleanup Limit? | NO | | NO | | NO | | NA | | NA | | NO | | NO | | YES | | NO | | YES | |
| > 10% above Cleanup Limit? | NO | | NO | | NO | | NA | | NA | | NO | | NO | | NO | | NO | | NO | |
| Any sample > 2X Cleanup Limit? | NO | | NO | | NO | | NA | | NA | | NO | | NO | | NO | | NO | | YES | |
| **3-Part Test Compliance?** | 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. | | Because all values are below background (0.33 mg/kg) the 3-part test is not required. | | Because all values are below background (11.8 mg/kg) the 3-part test is not required. | | Because all values are below background (11.8 mg/kg) the 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. | | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | | The data set meets the 3-part test criteria when compared to the most stringent RAG. | | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | |

**100-H-28:2 and 100-H-42 Waste Sites Maximum Calculations**
**Verification Data - Excavation 2**

| Sample Area | Sample Number | Sample Date | Benzo(a)anthracene (Method 8310) | | | Benzo(a)pyrene (Method 8270) | | | Benzo(a)pyrene (Method 8310) | | | Benzo(b)fluoranthene (Method 8270) | | | Benzo(b)fluoranthene (Method 8310) | | | Benzo(ghi)perylene (Method 8270) | | | Benzo(ghi)perylene (Method 8310) | | | Benzo(k)fluoranthene (Method 8310) | | | Chrysene (Method 8270) | | | Chrysene (Method 8310) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| EXC2-7 | J1V292 | 12/12/14 | 16 | | 3.0 | 20 | U | 20 | 13 | J | 6.1 | 26 | U | 26 | 17 | | 4.0 | 16 | U | 16 | 6.8 | U | 6.8 | 5.3 | J | 3.7 | 26 | U | 26 | 12 | J | 4.6 |
| Duplicate of J1V292 | J1V298 | 12/12/14 | 6.1 | J | 3.1 | 21 | U | 21 | 7.7 | J | 6.2 | 27 | U | 27 | 6.2 | JX | 4.1 | 17 | U | 17 | 7.0 | U | 7.0 | 3.8 | U | 3.8 | 28 | U | 28 | 4.7 | UX | 4.7 |
| EXC2-1 | J1V286 | 12/12/14 | 3.3 | U | 3.3 | 20 | U | 20 | 6.6 | U | 6.6 | 26 | U | 26 | 4.3 | U | 4.3 | 16 | U | 16 | 7.4 | U | 7.4 | 4.0 | U | 4.0 | 27 | U | 27 | 5.0 | U | 5.0 |
| EXC2-2 | J1V287 | 12/12/14 | 3.1 | U | 3.1 | 20 | U | 20 | 6.3 | U | 6.3 | 27 | U | 27 | 4.1 | U | 4.1 | 16 | U | 16 | 7.1 | U | 7.1 | 3.9 | U | 3.9 | 27 | U | 27 | 4.8 | U | 4.8 |
| EXC2-3 | J1V288 | 12/12/14 | 12 | JX | 3.1 | 20 | U | 20 | 26 | | 6.2 | 38 | J | 27 | 28 | X | 4.1 | 16 | U | 16 | 25 | J | 7.0 | 11 | J | 3.8 | 28 | U | 28 | 23 | J | 4.7 |
| EXC2-4 | J1V289 | 12/12/14 | 3.2 | U | 3.2 | 20 | U | 20 | 6.4 | U | 6.4 | 26 | U | 26 | 4.2 | U | 4.2 | 16 | U | 16 | 7.2 | U | 7.2 | 4.0 | U | 4.0 | 26 | U | 26 | 4.9 | U | 4.9 |
| EXC2-5 | J1V290 | 12/12/14 | 3.0 | U | 3.0 | 20 | U | 20 | 6.0 | U | 6.0 | 26 | U | 26 | 3.9 | U | 3.9 | 16 | U | 16 | 6.8 | U | 6.8 | 3.7 | U | 3.7 | 27 | U | 27 | 4.5 | U | 4.5 |
| EXC2-6 | J1V291 | 12/12/14 | 3.2 | U | 3.2 | 21 | U | 21 | 6.3 | U | 6.3 | 27 | U | 27 | 4.1 | U | 4.1 | 17 | U | 17 | 7.1 | U | 7.1 | 3.9 | U | 3.9 | 28 | U | 28 | 4.8 | U | 4.8 |
| EXC2-8 | J1V293 | 12/12/14 | 3.2 | U | 3.2 | 20 | U | 20 | 6.4 | U | 6.4 | 26 | U | 26 | 4.2 | U | 4.2 | 16 | U | 16 | 7.2 | U | 7.2 | 3.9 | U | 3.9 | 27 | U | 27 | 4.8 | U | 4.8 |
| EXC2-9 | J1V294 | 12/12/14 | 3.2 | UN | 3.2 | 21 | U | 21 | 6.4 | U | 6.4 | 27 | U | 27 | 4.2 | UN | 4.2 | 17 | U | 17 | 7.2 | U | 7.2 | 4.0 | UN | 4.0 | 28 | U | 28 | 4.9 | U | 4.9 |
| EXC2-10 | J1V295 | 12/12/14 | 3.0 | U | 3.0 | 20 | U | 20 | 6.1 | U | 6.1 | 26 | U | 26 | 4.0 | U | 4.0 | 16 | U | 16 | 6.8 | U | 6.8 | 3.7 | U | 3.7 | 27 | U | 27 | 4.6 | U | 4.6 |
| EXC2-11 | J1V296 | 12/12/14 | 3.0 | U | 3.0 | 20 | U | 20 | 6.0 | U | 6.0 | 26 | U | 26 | 4.0 | U | 4.0 | 16 | U | 16 | 6.8 | U | 6.8 | 3.7 | U | 3.7 | 27 | U | 27 | 4.6 | U | 4.6 |
| EXC2-12 | J1V297 | 12/12/14 | 6.2 | JX | 3.2 | 41 | J | 21 | 14 | J | 6.5 | 53 | J | 27 | 16 | | 4.3 | 29 | J | 17 | 7.3 | U | 7.3 | 4.1 | J | 4.0 | 45 | J | 28 | 10 | J | 4.9 |

**3-Part Test Evaluations**

| | Benzo(a)anthracene (Method 8310) | | Benzo(a)pyrene (Method 8270) | | Benzo(a)pyrene (Method 8310) | | Benzo(b)fluoranthene (Method 8270) | | Benzo(b)fluoranthene (Method 8310) | | Benzo(ghi)perylene (Method 8270) | | Benzo(ghi)perylene (Method 8310) | | Benzo(k)fluoranthene (Method 8310) | | Chrysene (Method 8270) | | Chrysene (Method 8310) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % < Detection limit | 75% | | 92% | | 75% | | 83% | | 75% | | 92% | | 92% | | 75% | | 92% | | 75% | |
| Maximum value | 16 | | 41 | | 26 | | 53 | | 28 | | 29 | | 25 | | 11 | | 45 | | 23 | |
| **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise** | 15 ug/kg | GW & River Protection | 15 ug/kg | GW & River Protection | 15 ug/kg | GW & River Protection | 15 ug/kg | GW & River Protection | 15 ug/kg | GW & River Protection | 48,000 ug/kg | GW Protection | 48,000 ug/kg | GW Protection | 15 ug/kg | GW & River Protection | 100 ug/kg | River Protection | 100 ug/kg | River Protection |
| **3-PART TEST** | | | | | | | | | | | | | | | | | | | | |
| Maximum > Cleanup Limit? | YES | | YES | | YES | | YES | | YES | | NO | | NO | | NO | | NO | | NO | |
| > 10% above Cleanup Limit? | NO | | NO | | NO | | YES | | NO | | NO | | NO | | NO | | NO | | NO | |
| Any sample > 2X Cleanup Limit? | NO | | YES | | NO | | YES | | NO | | NO | | NO | | NO | | NO | | NO | |
| **3-Part Test Compliance?** | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure 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. | | 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. | |

**MAXIMUM VALUE 3-PART TEST CALCULATION SHEET**

***Washington Closure Hanford***

**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 16 of 43

1 **100-H-28:2 and 100-H-42 Waste Sites Maximum Calculations**
2 **Verification Data - Excavation 2**

| 3 | Sample Area | Sample Number | Sample Date | Fluoranthene (Method 8270) | | | Fluoranthene (Method 8310) | | | Indeno(1,2,3-cd) pyrene (Method 8310) | | | Phenanthrene (Method 8270) | | | Phenanthrene (Method 8310) | | | Pyrene (Method 8270) | | | Pyrene (Method 8310) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | | | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 5 | EXC2-7 | J1V292 | 12/12/14 | 35 | U | 35 | 33 | J | 12 | 11 | U | 11 | 17 | U | 17 | 16 | J | 11 | 18 | J | 12 | 30 | J | 11 |
| 6 | Duplicate of J1V292 | J1V298 | 12/12/14 | 38 | U | 38 | 13 | U | 13 | 12 | U | 12 | 18 | U | 18 | 12 | U | 12 | 13 | U | 13 | 12 | U | 12 |
| 7 | EXC2-1 | J1V286 | 12/12/14 | 36 | U | 36 | 13 | U | 13 | 12 | U | 12 | 17 | U | 17 | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 |
| 8 | EXC2-2 | J1V287 | 12/12/14 | 36 | U | 36 | 13 | U | 13 | 12 | U | 12 | 17 | U | 17 | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 |
| 9 | EXC2-3 | J1V288 | 12/12/14 | 37 | U | 37 | 31 | J | 13 | 21 | J | 12 | 17 | U | 17 | 12 | U | 12 | 33 | J | 12 | 34 | J | 12 |
| 10 | EXC2-4 | J1V289 | 12/12/14 | 35 | U | 35 | 13 | U | 13 | 12 | U | 12 | 17 | U | 17 | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 |
| 11 | EXC2-5 | J1V290 | 12/12/14 | 36 | U | 36 | 12 | U | 12 | 11 | U | 11 | 17 | U | 17 | 11 | U | 11 | 12 | U | 12 | 11 | U | 11 |
| 12 | EXC2-6 | J1V291 | 12/12/14 | 38 | U | 38 | 13 | U | 13 | 12 | U | 12 | 18 | U | 18 | 12 | U | 12 | 13 | U | 13 | 12 | U | 12 |
| 13 | EXC2-8 | J1V293 | 12/12/14 | 36 | U | 36 | 13 | U | 13 | 12 | U | 12 | 17 | U | 17 | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 |
| 14 | EXC2-9 | J1V294 | 12/12/14 | 38 | U | 38 | 13 | UN | 13 | 12 | UN | 12 | 18 | U | 18 | 12 | UN | 12 | 13 | U | 13 | 12 | U | 12 |
| 15 | EXC2-10 | J1V295 | 12/12/14 | 36 | U | 36 | 12 | U | 12 | 11 | U | 11 | 17 | U | 17 | 11 | U | 11 | 12 | U | 12 | 11 | U | 11 |
| 16 | EXC2-11 | J1V296 | 12/12/14 | 36 | U | 36 | 12 | U | 12 | 11 | U | 11 | 17 | U | 17 | 11 | U | 11 | 12 | U | 12 | 11 | U | 11 |
| 17 | EXC2-12 | J1V297 | 12/12/14 | 78 | J | 37 | 24 | J | 13 | 12 | U | 12 | 44 | J | 18 | 12 | U | 12 | 71 | J | 13 | 24 | J | 12 |

18 **3-Part Test Evaluations**

| 19 | | Fluoranthene (Method 8270) | Fluoranthene (Method 8310) | Indeno(1,2,3-cd) pyrene (Method 8310) | Phenanthrene (Method 8270) | Phenanthrene (Method 8310) | Pyrene (Method 8270) | Pyrene (Method 8310) |
|---|---|---|---|---|---|---|---|---|
| 20 | % < Detection limit | 92% | 75% | 92% | 92% | 92% | 75% | 75% |
| 21 | Maximum value | 78 | 33 | 21 | 44 | 16 | 71 | 34 |
| 22 | **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise** | 18,000 ug/kg River Protection | 18,000 ug/kg River Protection | 330 ug/kg GW & River Protection | 240,000 ug/kg GW Protection | 240,000 ug/kg GW Protection | 48,000 ug/kg GW Protection | 48,000 ug/kg GW Protection |
| 23 | **3-PART TEST** | | | | | | | |
| 24 | Maximum > Cleanup Limit? | NO | NO | NO | NO | NO | NO | NO |
| 25 | > 10% above Cleanup Limit? | NO | NO | NO | NO | NO | NO | NO |
| 26 | Any sample > 2X Cleanup Limit? | NO | NO | NO | NO | NO | NO | NO |
| 27 | **3-Part Test Compliance?** | 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. | 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** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 17 of 43

**100-H-28:2 and 100-H-42 Waste Sites Statistical Calculations**
**Verification Data - Staging Pile Area**

| Sample Area | Sample Number | Sample Date | Cesium-137 | | | Europium-152 | | | Europium-155 | | | Carbon-14 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA |
| SPA-1 | J1V4L5 | 2/26/15 | -0.000324 | U | 0.0306 | 0.0465 | U | 0.0833 | -0.00238 | U | 0.106 | -0.0493 | U | 0.323 |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | -0.0148 | U | 0.0215 | 0.0104 | U | 0.0513 | 0.0590 | U | 0.0506 | 0.0652 | U | 0.327 |
| SPA-2 | J1V4L6 | 2/26/15 | 0.0443 | U | 0.0420 | -0.0535 | U | 0.0796 | -0.00989 | U | 0.0819 | 0.459 | | 0.322 |
| SPA-3 | J1V4L7 | 2/26/15 | 0.00527 | U | 0.0237 | -0.0269 | U | 0.0552 | 0.0360 | U | 0.0663 | 0.0384 | U | 0.329 |
| SPA-4 | J1V4L8 | 2/26/15 | -0.000219 | U | 0.0222 | 0.00699 | U | 0.0454 | 0.0264 | U | 0.0382 | 0.0550 | U | 0.327 |
| SPA-5 | J1V4L9 | 2/26/15 | 0.01420 | U | 0.0238 | 0.00800 | U | 0.0475 | 0.0358 | U | 0.0400 | -0.157 | U | 0.327 |
| SPA-6 | J1V4M0 | 2/26/15 | -0.00240 | U | 0.0208 | 0.00768 | U | 0.0488 | 0.0314 | U | 0.0467 | -0.0138 | U | 0.328 |
| SPA-7 | J1V4M1 | 2/26/15 | 0.0510 | U | 0.0344 | 0.140 | U | 0.0797 | -0.0252 | U | 0.0992 | 0.0659 | U | 0.328 |
| SPA-8 | J1V4M2 | 2/26/15 | -0.00751 | U | 0.0368 | 0.0128 | U | 0.0958 | 0.0221 | U | 0.0969 | 0.0757 | U | 0.329 |
| SPA-9 | J1V4M3 | 2/26/15 | 0.0709 | | 0.0189 | 0.0116 | U | 0.0414 | 0.0441 | U | 0.0382 | 0.0593 | U | 0.328 |
| SPA-10 | J1V4M4 | 2/26/15 | 0.0278 | U | 0.0272 | 0.0289 | U | 0.0567 | 0.0164 | U | 0.0637 | -0.00109 | U | 0.328 |
| SPA-11 | J1V4M5 | 4/2/15 | -0.00972 | U | 0.0158 | -0.0127 | U | 0.0395 | 0.0116 | U | 0.0380 | -0.0411 | U | 0.332 |
| SPA-12 | J1V4M6 | 4/2/15 | -0.00183 | U | 0.0220 | -0.0289 | U | 0.0505 | 0.0510 | U | 0.0500 | -0.176 | U | 0.332 |
| SPA-13 | J1V4M7 | 2/26/15 | 0.382 | | 0.0259 | 0.261 | | 0.0562 | 0.0881 | | 0.0457 | 0.0956 | U | 0.319 |
| SPA-14 | J1V4M8 | 2/26/15 | 0.0637 | | 0.0253 | 0.0315 | U | 0.0694 | 0.0225 | U | 0.0736 | 0.122 | U | 0.327 |
| SPA-15 | J1V4M9 | 4/2/15 | 0.0149 | U | 0.0447 | -0.0717 | U | 0.0895 | -0.00229 | U | 0.0949 | -0.268 | U | 0.332 |

**Statistical Computation Input Data**

| Sample Area | Sample Number | Sample Date | Cesium-137 pCi/g | Europium-152 pCi/g | Europium-155 pCi/g | Carbon-14 pCi/g |
|---|---|---|---|---|---|---|
| SPA-1 | J1V4L5/ J1V4N0 | 2/26/15 | -0.00756 | 0.0285 | 0.0283 | 0.00795 |
| SPA-2 | J1V4L6 | 2/26/15 | 0.0443 | -0.0535 | -0.00989 | 0.459 |
| SPA-3 | J1V4L7 | 2/26/15 | 0.00527 | -0.0269 | 0.0360 | 0.0384 |
| SPA-4 | J1V4L8 | 2/26/15 | -0.000219 | 0.00699 | 0.0264 | 0.0550 |
| SPA-5 | J1V4L9 | 2/26/15 | 0.0142 | 0.00800 | 0.0358 | -0.157 |
| SPA-6 | J1V4M0 | 2/26/15 | -0.00240 | 0.00768 | 0.0314 | -0.0138 |
| SPA-7 | J1V4M1 | 2/26/15 | 0.0510 | 0.140 | -0.0252 | 0.0659 |
| SPA-8 | J1V4M2 | 2/26/15 | -0.00751 | 0.0128 | 0.0221 | 0.0757 |
| SPA-9 | J1V4M3 | 2/26/15 | 0.0709 | 0.0116 | 0.0441 | 0.0593 |
| SPA-10 | J1V4M4 | 2/26/15 | 0.0278 | 0.0289 | 0.0164 | -0.00109 |
| SPA-11 | J1V4M5 | 4/2/15 | -0.00972 | -0.0127 | 0.0116 | -0.0411 |
| SPA-12 | J1V4M6 | 4/2/15 | -0.00183 | -0.0289 | 0.0510 | -0.176 |
| SPA-13 | J1V4M7 | 2/26/15 | 0.382 | 0.261 | 0.0881 | 0.0956 |
| SPA-14 | J1V4M8 | 2/26/15 | 0.0637 | 0.0315 | 0.0225 | 0.122 |
| SPA-15 | J1V4M9 | 4/2/15 | 0.0149 | -0.0717 | -0.00229 | -0.268 |

**Statistical Computations**

| | Cesium-137 | Europium-152 | Europium-155 | Carbon-14 |
|---|---|---|---|---|
| 95% UCL based on | Radionuclide data set. Use nonparametric z-statistic. | Radionuclide data set. Use nonparametric z-statistic. | Radionuclide data set. Use nonparametric z-statistic. | Radionuclide data set. Use nonparametric z-statistic. |
| N | 15 | 15 | 15 | 15 |
| % < Detection limit | 80% | 93% | 93% | 93% |
| Mean | 0.0430 | 0.0229 | 0.0251 | 0.0215 |
| Standard deviation | 0.0976 | 0.0814 | 0.0268 | 0.164 |
| Z-statistic | 1.64 | 1.64 | 1.64 | 1.64 |
| 95% UCL on mean | 0.0844 | 0.0574 | 0.0365 | 0.0910 |
| Maximum value | 0.382 | 0.261 | 0.0881 | 0.459 |

**CALCULATION SHEET**

*Washington Closure Hanford*
**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/16/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/16/15
**Sheet No.** 18 of 43

**100-H-28:2 and 100-H-42 Waste Sites Statistical Calculations**

**Verification Data - Staging Pile Area**

| Sample Area | Sample Number | Sample Date | Arsenic mg/kg | Q | PQL | Barium mg/kg | Q | PQL | Beryllium mg/kg | Q | PQL | Boron mg/kg | Q | PQL | Cadmium mg/kg | Q | PQL | Chromium mg/kg | Q | PQL | Cobalt mg/kg | Q | PQL | Copper mg/kg | Q | PQL | Lead mg/kg | Q | PQL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SPA-1 | J1V4L5 | 2/26/15 | 3.7 | | 0.58 | 61.6 | X | 0.067 | 0.26 | | 0.029 | 1.0 | B | 0.86 | 0.11 | B | 0.036 | 10.4 | | 0.051 | 5.9 | X | 0.088 | 10.8 | X | 0.19 | 4.3 | | 0.24 |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 4.0 | | 0.62 | 61.8 | X | 0.071 | 0.26 | | 0.031 | 0.92 | U | 0.92 | 0.11 | B | 0.038 | 9.9 | | 0.054 | 5.5 | X | 0.094 | 10.9 | X | 0.20 | 3.8 | | 0.25 |
| SPA-2 | J1V4L6 | 2/26/15 | 3.6 | | 0.62 | 68.0 | X | 0.071 | 0.26 | | 0.031 | 1.6 | B | 0.91 | 0.15 | B | 0.038 | 9.8 | | 0.054 | 6.2 | X | 0.093 | 15.1 | X | 0.20 | 8.2 | | 0.25 |
| SPA-3 | J1V4L7 | 2/26/15 | 4.1 | | 0.60 | 51.4 | X | 0.069 | 0.24 | | 0.030 | 0.90 | B | 0.89 | 0.13 | B | 0.037 | 9.3 | | 0.052 | 5.6 | X | 0.090 | 13.7 | X | 0.20 | 6.0 | | 0.24 |
| SPA-4 | J1V4L8 | 2/26/15 | 4.0 | | 0.62 | 50.8 | X | 0.071 | 0.23 | | 0.031 | 1.4 | B | 0.92 | 0.14 | B | 0.038 | 9.7 | | 0.054 | 5.9 | X | 0.094 | 14.4 | X | 0.20 | 13.2 | | 0.25 |
| SPA-5 | J1V4L9 | 2/26/15 | 2.1 | | 0.59 | 40.0 | X | 0.067 | 0.21 | | 0.029 | 1.0 | B | 0.87 | 0.11 | B | 0.036 | 9.8 | | 0.051 | 5.1 | X | 0.089 | 12.7 | X | 0.19 | 4.2 | | 0.24 |
| SPA-6 | J1V4M0 | 2/26/15 | 2.8 | | 0.63 | 40.6 | X | 0.072 | 0.22 | | 0.031 | 1.0 | B | 0.93 | 0.12 | B | 0.039 | 9.0 | | 0.055 | 5.4 | X | 0.10 | 12.5 | X | 0.21 | 3.0 | | 0.26 |
| SPA-7 | J1V4M1 | 2/26/15 | 3.5 | | 0.60 | 145 | X | 0.069 | 0.29 | | 0.030 | 12.0 | | 0.89 | 0.13 | B | 0.037 | 10.0 | | 0.052 | 6.2 | X | 0.090 | 15.7 | X | 0.20 | 7.0 | | 0.24 |
| SPA-8 | J1V4M2 | 2/26/15 | 3.4 | | 0.63 | 80.9 | X | 0.073 | 0.38 | | 0.032 | 1.2 | B | 0.94 | 0.13 | B | 0.039 | 12.6 | | 0.056 | 7.7 | X | 0.10 | 16.4 | X | 0.21 | 5.1 | | 0.26 |
| SPA-9 | J1V4M3 | 2/26/15 | 3.3 | | 0.65 | 57.6 | X | 0.075 | 0.23 | | 0.032 | 0.96 | U | 0.96 | 0.14 | B | 0.040 | 9.6 | | 0.057 | 5.4 | X | 0.10 | 14.4 | X | 0.21 | 7.4 | | 0.27 |
| SPA-10 | J1V4M4 | 2/26/15 | 4.4 | | 0.63 | 47.0 | X | 0.073 | 0.23 | | 0.031 | 1.0 | B | 0.93 | 0.13 | B | 0.039 | 9.5 | | 0.055 | 5.9 | X | 0.10 | 15.8 | X | 0.21 | 8.8 | | 0.26 |
| SPA-11 | J1V4M5 | 4/2/15 | 1.7 | | 0.58 | 40.5 | X | 0.067 | 0.13 | | 0.029 | 0.86 | U | 0.86 | 0.13 | B | 0.036 | 7.8 | X | 0.051 | 6.6 | X | 0.088 | 12.6 | | 0.19 | 2.6 | | 0.24 |
| SPA-12 | J1V4M6 | 4/2/15 | 16.6 | | 0.59 | 62.8 | X | 0.068 | 0.21 | | 0.030 | 1.4 | B | 0.88 | 0.086 | B | 0.037 | 12.5 | X | 0.052 | 6.6 | X | 0.090 | 13.8 | | 0.20 | 59.2 | | 0.24 |
| SPA-13 | J1V4M7 | 2/26/15 | 56 | | 0.65 | 91.1 | X | 0.074 | 0.37 | | 0.032 | 2.5 | | 0.96 | 0.65 | | 0.040 | 13.1 | | 0.057 | 7.9 | X | 0.10 | 16.8 | X | 0.21 | 296 | | 0.26 |
| SPA-14 | J1V4M8 | 2/26/15 | 6.1 | | 0.62 | 54.6 | X | 0.071 | 0.26 | | 0.031 | 1.4 | B | 0.92 | 0.15 | B | 0.038 | 11.2 | | 0.054 | 6.1 | X | 0.094 | 14.1 | X | 0.20 | 18.2 | | 0.25 |
| SPA-15 | J1V4M9 | 4/2/15 | 21.9 | | 0.64 | 85.9 | X | 0.073 | 0.25 | | 0.032 | 2.9 | | 0.95 | 0.13 | B | 0.040 | 13.7 | X | 0.056 | 7.7 | X | 0.10 | 25.8 | | 0.21 | 54.8 | | 0.26 |

**Statistical Computation Input Data**

| Sample Area | Sample Number | Sample Date | Arsenic mg/kg | Barium mg/kg | Beryllium mg/kg | Boron mg/kg | Cadmium mg/kg | Chromium mg/kg | Cobalt mg/kg | Copper mg/kg | Lead mg/kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SPA-1 | J1V4L5/ J1V4N0 | 2/26/15 | 3.9 | 61.7 | 0.26 | 0.73 | 0.11 | 10.2 | 5.7 | 10.9 | 4.1 |
| SPA-2 | J1V4L6 | 2/26/15 | 3.6 | 68.0 | 0.26 | 1.6 | 0.15 | 9.8 | 6.2 | 15.1 | 8.2 |
| SPA-3 | J1V4L7 | 2/26/15 | 4.1 | 51.4 | 0.24 | 0.90 | 0.13 | 9.3 | 5.6 | 13.7 | 6.0 |
| SPA-4 | J1V4L8 | 2/26/15 | 4.0 | 50.8 | 0.23 | 1.4 | 0.14 | 9.7 | 5.9 | 14.4 | 13.2 |
| SPA-5 | J1V4L9 | 2/26/15 | 2.1 | 40.0 | 0.21 | 1.0 | 0.11 | 9.8 | 5.1 | 12.7 | 4.2 |
| SPA-6 | J1V4M0 | 2/26/15 | 2.8 | 40.6 | 0.22 | 1.0 | 0.120 | 9.0 | 5.4 | 12.5 | 3.0 |
| SPA-7 | J1V4M1 | 2/26/15 | 3.5 | 145 | 0.29 | 12.0 | 0.13 | 10.0 | 6.2 | 15.7 | 7.0 |
| SPA-8 | J1V4M2 | 2/26/15 | 3.4 | 80.9 | 0.38 | 1.2 | 0.13 | 12.6 | 7.7 | 16.4 | 5.1 |
| SPA-9 | J1V4M3 | 2/26/15 | 3.3 | 57.6 | 0.23 | 0.48 | 0.14 | 9.6 | 5.4 | 14.4 | 7.4 |
| SPA-10 | J1V4M4 | 2/26/15 | 4.4 | 47.0 | 0.23 | 1.0 | 0.13 | 9.5 | 5.9 | 15.8 | 8.8 |
| SPA-11 | J1V4M5 | 4/2/15 | 1.7 | 40.5 | 0.13 | 0.43 | 0.13 | 7.8 | 6.6 | 12.6 | 2.6 |
| SPA-12 | J1V4M6 | 4/2/15 | 16.6 | 62.8 | 0.21 | 1.4 | 0.086 | 12.5 | 6.6 | 13.8 | 59.2 |
| SPA-13 | J1V4M7 | 2/26/15 | 56.0 | 91.1 | 0.37 | 2.5 | 0.65 | 13.1 | 7.9 | 16.8 | 296 |
| SPA-14 | J1V4M8 | 2/26/15 | 6.1 | 54.6 | 0.26 | 1.4 | 0.15 | 11.2 | 6.1 | 14.1 | 18.2 |
| SPA-15 | J1V4M9 | 4/2/15 | 21.9 | 85.9 | 0.25 | 2.9 | 0.13 | 13.7 | 7.7 | 25.8 | 54.8 |

**Statistical Computations**

| | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead |
|---|---|---|---|---|---|---|---|---|---|
| 95% UCL based on | 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), lognormal and normal distribution rejected, use z-statistic. | Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic. | 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), lognormal and normal distribution rejected, use z-statistic. | Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic. |
| N | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| % < Detection limit | 0% | 0% | 0% | 13% | 0% | 0% | 0% | 0% | 0% |
| mean | 9.2 | 65.2 | 0.25 | 2.0 | 0.16 | 10.5 | 6.3 | 15.0 | 33.2 |
| st. dev. | 14.1 | 27.4 | 0.062 | 2.8 | 0.14 | 1.7 | 0.88 | 3.4 | 74.9 |
| 95% UCL on mean | 15.2 | 78.2 | 0.28 | 3.2 | 0.22 | 11.3 | 6.7 | 16.4 | 65.0 |
| max value | 56.0 | 145 | 0.38 | 12.0 | 0.65 | 13.7 | 7.9 | 25.8 | 296 |
| **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)** | 20 DE, GW & River Protection | 200 GW Protection | 1.51 GW & River Protection | 320 GW Protection | 0.81 GW & River Protection | 18.5 GW & River Protection | 15.7 GW Protection | 22.0 River Protection | 10.2 GW & River Protection |
| **WAC 173-340 3-PART TEST** | | | | | | | | | |
| 95% UCL > Cleanup Limit? | NO | NO | NA | NO | NA | NA | NA | NO | YES |
| > 10% above Cleanup Limit? | YES | NO | NA | NO | NA | NA | NA | NO | YES |
| Any sample > 2X Cleanup Limit? | YES | NO | NA | NO | NA | NA | NA | NO | YES |
| **WAC 173-340 Compliance?** | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | The data set meets the 3-part test criteria when compared to the most stringent RAG. | Because all values are below background (1.51 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. | Because all values are below background (0.81 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. | The data set meets the 3-part test criteria when compared to the most stringent RAG. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. |

**CALCULATION SHEET**

*Washington Closure Hanford*

Originator I. B. Berezovskiy
Project 100-H Area Closure Operations
Subject 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

Date 07/16/15
Job No. 14655

Calc. No. 0100H-CA-V0230
Checked J. D. Skoglie

Rev. No. 0
Date 07/16/15
Sheet No. 19 of 43

**100-H-28:2 and 100-H-42 Waste Sites Statistical Calculations**
**Verification Data - Staging Pile Area**

| Sample Area | Sample Number | Sample Date | Manganese mg/kg | Q | PQL | Mercury mg/kg | Q | PQL | Nickel mg/kg | Q | PQL | Vanadium mg/kg | Q | PQL | Zinc mg/kg | Q | PQL | Chloride mg/kg | Q | PQL | Fluoride mg/kg | Q | PQL | Sulfate mg/kg | Q | PQL | TPH - Diesel EXT. ug/kg | Q | PQL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SPA-1 | J1V4L5 | 2/26/15 | 320 | X | 0.088 | 0.0066 | U | 0.0066 | 10.9 | X | 0.11 | 39.3 | | 0.083 | 36.3 | X | 0.35 | 7.6 | C | 2.0 | 0.99 | B | 0.82 | 6.8 | | 1.7 | 1100 | J | 1000 |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 275 | X | 0.094 | 0.0058 | U | 0.0058 | 10.6 | X | 0.12 | 34.0 | | 0.088 | 34.3 | X | 0.37 | 7.2 | C | 2.0 | 0.98 | B | 0.84 | 6.8 | | 1.7 | 1000 | U | 1000 |
| SPA-2 | J1V4L6 | 2/26/15 | 257 | X | 0.093 | 0.0073 | B | 0.0068 | 10.3 | X | 0.11 | 47.4 | | 0.088 | 37.2 | X | 0.37 | 10.0 | CM | 2.0 | 0.94 | B | 0.81 | 8.8 | | 1.7 | 6800 | | 1000 |
| SPA-3 | J1V4L7 | 2/26/15 | 244 | X | 0.090 | 0.022 | | 0.0061 | 9.4 | X | 0.11 | 39.9 | | 0.085 | 33.7 | X | 0.36 | 7.4 | C | 2.0 | 0.96 | B | 0.80 | 7.3 | | 1.7 | 1900 | J | 960 |
| SPA-4 | J1V4L8 | 2/26/15 | 259 | X | 0.094 | 0.041 | | 0.0062 | 10.4 | X | 0.12 | 41.2 | | 0.088 | 35.9 | X | 0.37 | 7.9 | C | 2.0 | 1.1 | B | 0.82 | 8.6 | | 1.7 | 8100 | | 1000 |
| SPA-5 | J1V4L9 | 2/26/15 | 233 | X | 0.089 | 0.0099 | B | 0.0066 | 10.3 | X | 0.11 | 39.2 | | 0.083 | 31.6 | X | 0.35 | 6.9 | C | 1.9 | 0.79 | U | 0.79 | 6.3 | | 1.6 | 3500 | J | 990 |
| SPA-6 | J1V4M0 | 2/26/15 | 242 | X | 0.095 | 0.0065 | U | 0.0065 | 10.7 | X | 0.12 | 41.5 | | 0.089 | 31.4 | X | 0.38 | 7.1 | C | 2.0 | 0.93 | B | 0.82 | 7.2 | | 1.7 | 1000 | U | 1000 |
| SPA-7 | J1V4M1 | 2/26/15 | 265 | X | 0.090 | 0.012 | B | 0.0068 | 10.8 | X | 0.11 | 44.8 | | 0.085 | 35.9 | X | 0.36 | 9.7 | C | 2.0 | 1.1 | B | 0.83 | 20.3 | | 1.7 | 7400 | | 1000 |
| SPA-8 | J1V4M2 | 2/26/15 | 332 | X | 0.096 | 0.0066 | U | 0.0066 | 13.7 | X | 0.12 | 43.5 | | 0.090 | 40.6 | X | 0.38 | 8.5 | C | 2.1 | 1.5 | B | 0.86 | 12.9 | | 1.8 | 2600 | J | 1000 |
| SPA-9 | J1V4M3 | 2/26/15 | 430 | X | 0.098 | 0.0066 | U | 0.0066 | 12.1 | X | 0.12 | 40.2 | | 0.092 | 32.4 | X | 0.39 | 7.9 | C | 2.0 | 1.1 | B | 0.81 | 7.9 | | 1.7 | 6000 | | 1000 |
| SPA-10 | J1V4M4 | 2/26/15 | 262 | X | 0.095 | 0.012 | B | 0.0065 | 11.1 | X | 0.12 | 40.8 | | 0.090 | 32.6 | X | 0.38 | 7.8 | C | 2.0 | 1.1 | B | 0.84 | 8.7 | | 1.7 | 2700 | J | 960 |
| SPA-11 | J1V4M5 | 4/2/15 | 218 | X | 0.088 | 0.0064 | U | 0.0064 | 7.2 | X | 0.11 | 46.8 | X | 0.082 | 28.3 | X | 0.35 | 7.2 | C | 2.0 | 1.8 | B | 0.82 | 9.6 | | 1.7 | 1500 | J | 960 |
| SPA-12 | J1V4M6 | 4/2/15 | 256 | X | 0.090 | 0.043 | | 0.0062 | 11.0 | X | 0.11 | 40.3 | X | 0.084 | 34.6 | X | 0.36 | 11.8 | C | 2.1 | 3.0 | B | 0.84 | 181 | | 1.7 | 20000 | | 1100 |
| SPA-13 | J1V4M7 | 2/26/15 | 378 | X | 0.098 | 0.0079 | B | 0.0070 | 13.6 | X | 0.12 | 44.9 | | 0.092 | 50.6 | X | 0.39 | 8.4 | C | 2.1 | 2.7 | B | 0.85 | 8.1 | | 1.8 | 5300 | | 990 |
| SPA-14 | J1V4M8 | 2/26/15 | 273 | X | 0.094 | 0.0069 | U | 0.0069 | 11.8 | X | 0.12 | 39.9 | | 0.088 | 35.2 | X | 0.37 | 7.0 | C | 2.0 | 1.4 | B | 0.81 | 7.2 | | 1.7 | 3500 | J | 1000 |
| SPA-15 | J1V4M9 | 4/2/15 | 291 | X | 0.096 | 0.020 | | 0.0065 | 14.1 | X | 0.12 | 41.8 | X | 0.091 | 41.0 | X | 0.38 | 16.7 | C | 2.0 | 3.3 | B | 0.83 | 223 | | 1.7 | 38000 | | 1000 |

**Statistical Computation Input Data**

| Sample Area | Sample Number | Sample Date | Manganese mg/kg | Mercury mg/kg | Nickel mg/kg | Vanadium mg/kg | Zinc mg/kg | Chloride mg/kg | Fluoride mg/kg | Sulfate mg/kg | TPH - Diesel EXT. ug/kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SPA-1 | J1V4L5/ J1V4N0 | 2/26/15 | 298 | 0.0031 | 10.8 | 36.7 | 35.3 | 7.4 | 1.0 | 6.8 | 800 |
| SPA-2 | J1V4L6 | 2/26/15 | 257 | 0.0073 | 10.3 | 47.4 | 37.2 | 10.0 | 0.94 | 8.8 | 6800 |
| SPA-3 | J1V4L7 | 2/26/15 | 244 | 0.022 | 9.40 | 39.9 | 33.7 | 7.4 | 1.0 | 7.3 | 1900 |
| SPA-4 | J1V4L8 | 2/26/15 | 259 | 0.041 | 10.4 | 41.2 | 35.9 | 7.9 | 1.1 | 8.6 | 8100 |
| SPA-5 | J1V4L9 | 2/26/15 | 233 | 0.0099 | 10.3 | 39.2 | 31.6 | 6.9 | 0.40 | 6.3 | 3500 |
| SPA-6 | J1V4M0 | 2/26/15 | 242 | 0.0033 | 10.7 | 41.5 | 31.4 | 7.1 | 0.93 | 7.2 | 500 |
| SPA-7 | J1V4M1 | 2/26/15 | 265 | 0.012 | 10.8 | 44.8 | 35.9 | 9.7 | 1.1 | 20.3 | 7400 |
| SPA-8 | J1V4M2 | 2/26/15 | 332 | 0.0033 | 13.7 | 43.5 | 40.6 | 8.5 | 1.5 | 12.9 | 2600 |
| SPA-9 | J1V4M3 | 2/26/15 | 430 | 0.0033 | 12.1 | 40.2 | 32.4 | 7.9 | 1.1 | 7.9 | 6000 |
| SPA-10 | J1V4M4 | 2/26/15 | 262 | 0.012 | 11.1 | 40.8 | 32.6 | 7.8 | 1.1 | 8.7 | 2700 |
| SPA-11 | J1V4M5 | 4/2/15 | 218 | 0.0032 | 7.2 | 46.8 | 28.3 | 7.2 | 1.8 | 9.6 | 1500 |
| SPA-12 | J1V4M6 | 4/2/15 | 256 | 0.043 | 11.0 | 40.3 | 34.6 | 11.8 | 3.0 | 181 | 20000 |
| SPA-13 | J1V4M7 | 2/26/15 | 378 | 0.0079 | 13.6 | 44.9 | 50.6 | 8.4 | 2.7 | 8.1 | 5300 |
| SPA-14 | J1V4M8 | 2/26/15 | 273 | 0.0035 | 11.8 | 39.9 | 35.2 | 7.0 | 1.4 | 7.2 | 3500 |
| SPA-15 | J1V4M9 | 4/2/15 | 291 | 0.020 | 14.1 | 41.8 | 41.0 | 16.7 | 3.3 | 223 | 38000 |

**Statistical Computations**

| | Manganese | Mercury | Nickel | Vanadium | Zinc | Chloride | Fluoride | Sulfate | TPH - Diesel EXT. |
|---|---|---|---|---|---|---|---|---|---|
| 95% UCL based on | Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic. | Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic. | Large data set (n ≥ 10), use MTCAStat normal distribution. | 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), lognormal and normal distribution rejected, use z-statistic. | Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic. | Large data set (n ≥ 10), use MTCAStat lognormal distribution. |
| N | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| % < Detection limit | 0% | 40% | 0% | 0% | 0% | 0% | 7% | 0% | 7% |
| mean | 283 | 0.013 | 11.2 | 41.9 | 35.8 | 8.8 | 1.5 | 34.9 | 7240 |
| st. dev. | 57.4 | 0.013 | 1.8 | 3.0 | 5.3 | 2.6 | 0.85 | 68.4 | 9760 |
| 95% UCL on mean | 307 | 0.019 | 12.0 | 43.3 | 38.2 | 9.9 | 1.8 | 64.0 | 18381 |
| max value | 430 | 0.043 | 14.1 | 47.4 | 50.6 | 16.7 | 3.3 | 223 | 38000 |
| **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)** | 512 GW & River Protection | 0.33 GW & River Protection | 19.1 GW Protection | 85.1 GW Protection | 67.8 River Protection | 25,000 GW Protection | 96 GW Protection | 25,000 GW Protection | 200,000 DE, GW & River Protection |
| **WAC 173-340 3-PART TEST** | | | | | | | | | |
| 95% UCL > Cleanup Limit? | NA | NA | NA | NA | NA | NA | NO | NA | NO |
| > 10% above Cleanup Limit? | NA | NA | NA | NA | NA | NA | NO | NA | NO |
| Any sample > 2X Cleanup Limit? | NA | NA | NA | NA | NA | NA | NO | NA | NO |
| **WAC 173-340 Compliance?** | Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required. | Because all values are below background (0.33 mg/kg) the WAC 173-340 3-part test is not required. | 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. | Because all values are below background (100 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. | Because all values are below background (237 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. |

CALCULATION SHEET

*Washington Closure Hanford*

Originator I. B. Berezovskiy
Project 100-H Area Closure Operations
Subject 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

Date 07/16/15
Job No. 14655

Calc. No. 0100H-CA-V0230
Checked J. D. Skoglie

Rev. No. 0
Date 07/16/15
Sheet No. 20 of 43

**100-H-28:2 and 100-H-42 Waste Sites Statistical Calculations**

**Verification Data - Staging Pile Area**

| Sample Area | Sample Number | Sample Date | TPH - Diesel | | | Benzo(a)anthracene (Method 8310) | | | Benzo(a)pyrene (Method 8310) | | | Benzo(b)fluoranthene (Method 8310) | | | Fluoranthene (Method 8310) | | | Pyrene (Method 8270) | | | Pyrene (Method 8310) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| SPA-1 | J1V4L5 | 2/26/15 | 1500 | J | 700 | 3.3 | UN | 3.3 | 6.5 | U | 6.5 | 4.3 | U | 4.3 | 13 | UN | 13 | 12 | U | 12 | 12 | U | 12 |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 920 | J | 690 | 3.2 | U | 3.2 | 6.4 | U | 6.4 | 4.2 | U | 4.2 | 13 | U | 13 | 12 | U | 12 | 12 | U | 12 |
| SPA-2 | J1V4L6 | 2/26/15 | 3100 | J | 690 | 3.8 | JX | 3.2 | 6.5 | U | 6.5 | 4.2 | U | 4.2 | 13 | U | 13 | 13 | J | 12 | 12 | U | 12 |
| SPA-3 | J1V4L7 | 2/26/15 | 1800 | J | 650 | 3.2 | U | 3.2 | 6.4 | U | 6.4 | 4.2 | U | 4.2 | 13 | U | 13 | 12 | U | 12 | 12 | U | 12 |
| SPA-4 | J1V4L8 | 2/26/15 | 5400 | | 690 | 5.1 | JX | 3.2 | 16 | | 6.5 | 16 | | 4.2 | 27 | J | 13 | 210 | J | 12 | 33 | J | 12 |
| SPA-5 | J1V4L9 | 2/26/15 | 2300 | J | 680 | 3.1 | U | 3.1 | 6.3 | U | 6.3 | 4.1 | U | 4.1 | 13 | U | 13 | 12 | U | 12 | 12 | U | 12 |
| SPA-6 | J1V4M0 | 2/26/15 | 680 | U | 680 | 3.0 | U | 3.0 | 6.1 | U | 6.1 | 4.0 | U | 4.0 | 12 | U | 12 | 12 | U | 12 | 11 | U | 11 |
| SPA-7 | J1V4M1 | 2/26/15 | 4200 | | 690 | 29 | X | 3.3 | 42 | | 6.6 | 44 | | 4.3 | 75 | | 13 | 35 | J | 12 | 79 | | 12 |
| SPA-8 | J1V4M2 | 2/26/15 | 2300 | J | 680 | 3.3 | U | 3.3 | 6.5 | U | 6.5 | 4.3 | U | 4.3 | 13 | U | 13 | 13 | U | 13 | 12 | U | 12 |
| SPA-9 | J1V4M3 | 2/26/15 | 4000 | | 680 | 51 | | 3.2 | 38 | | 6.4 | 31 | X | 4.2 | 110 | X | 13 | 13 | U | 13 | 120 | | 12 |
| SPA-10 | J1V4M4 | 2/26/15 | 2200 | J | 650 | 23 | | 3.2 | 26 | | 6.5 | 28 | X | 4.3 | 52 | | 13 | 25 | J | 12 | 59 | | 12 |
| SPA-11 | J1V4M5 | 4/2/15 | 1800 | JB | 650 | 3.2 | U | 3.2 | 6.4 | U | 6.4 | 4.2 | U | 4.2 | 13 | U | 13 | 12 | U | 12 | 12 | U | 12 |
| SPA-12 | J1V4M6 | 4/2/15 | 8400 | B | 710 | 6.2 | JX | 3.4 | 19 | | 6.8 | 22 | X | 4.5 | 52 | | 14 | 34 | J | 13 | 46 | | 13 |
| SPA-13 | J1V4M7 | 2/26/15 | 3300 | J | 670 | 16 | | 3.3 | 22 | | 6.6 | 19 | | 4.3 | 32 | J | 13 | 29 | J | 13 | 46 | | 12 |
| SPA-14 | J1V4M8 | 2/26/15 | 2500 | J | 700 | 8.9 | JX | 3.1 | 9.3 | J | 6.3 | 7.7 | J | 4.1 | 16 | J | 13 | 89 | J | 12 | 22 | J | 12 |
| SPA-15 | J1V4M9 | 4/2/15 | 15000 | B | 690 | 29 | | 3.3 | 30 | | 6.6 | 35 | | 4.3 | 74 | | 13 | 60 | JX | 13 | 71 | | 12 |

**Statistical Computation Input Data**

| Sample Area | Sample Number | Sample Date | TPH - Diesel ug/kg | Benzo(a)anthracene (Method 8310) ug/kg | Benzo(a)pyrene (Method 8310) ug/kg | Benzo(b)fluoranthene (Method 8310) ug/kg | Fluoranthene (Method 8310) ug/kg | Pyrene (Method 8270) ug/kg | Pyrene (Method 8310) ug/kg |
|---|---|---|---|---|---|---|---|---|---|
| SPA-1 | J1V4L5/ J1V4N0 | 2/26/15 | 1210 | 1.6 | 3.2 | 2.1 | 6.5 | 6.0 | 6.0 |
| SPA-2 | J1V4L6 | 2/26/15 | 3100 | 3.8 | 3.3 | 2.1 | 6.5 | 13 | 6.0 |
| SPA-3 | J1V4L7 | 2/26/15 | 1800 | 1.6 | 3.2 | 2.1 | 6.5 | 6.0 | 6.0 |
| SPA-4 | J1V4L8 | 2/26/15 | 5400 | 5.1 | 16 | 16 | 27 | 210 | 33 |
| SPA-5 | J1V4L9 | 2/26/15 | 2300 | 1.6 | 3.2 | 2.1 | 6.5 | 6.0 | 6.0 |
| SPA-6 | J1V4M0 | 2/26/15 | 340 | 1.5 | 3.1 | 2.0 | 6.0 | 6.0 | 5.5 |
| SPA-7 | J1V4M1 | 2/26/15 | 4200 | 29 | 42 | 44 | 75 | 35 | 79 |
| SPA-8 | J1V4M2 | 2/26/15 | 2300 | 1.7 | 3.3 | 2.2 | 6.5 | 6.5 | 6.0 |
| SPA-9 | J1V4M3 | 2/26/15 | 4000 | 51 | 38 | 31 | 110 | 6.5 | 120 |
| SPA-10 | J1V4M4 | 2/26/15 | 2200 | 23 | 26 | 28 | 52 | 25 | 59 |
| SPA-11 | J1V4M5 | 4/2/15 | 1800 | 1.6 | 3.2 | 2.1 | 6.5 | 6.0 | 6.0 |
| SPA-12 | J1V4M6 | 4/2/15 | 8400 | 6.2 | 19 | 22 | 52 | 34 | 46 |
| SPA-13 | J1V4M7 | 2/26/15 | 3300 | 16 | 22 | 19 | 32 | 29 | 46 |
| SPA-14 | J1V4M8 | 2/26/15 | 2500 | 8.9 | 9.3 | 7.7 | 16 | 89 | 22 |
| SPA-15 | J1V4M9 | 4/2/15 | 15000 | 29 | 30 | 35 | 74 | 60 | 71 |

**Statistical Computations**

| | TPH - Diesel | Benzo(a)anthracene (Method 8310) | Benzo(a)pyrene (Method 8310) | Benzo(b)fluoranthene (Method 8310) | Fluoranthene (Method 8310) | Pyrene (Method 8270) | Pyrene (Method 8310) |
|---|---|---|---|---|---|---|---|
| 95% UCL based on | 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), lognormal and normal distribution rejected, use z-statistic. | Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic. | Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic. | Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic. | Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic. |
| N | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| % < Detection limit | 7% | 40% | 47% | 47% | 47% | 47% | 47% |
| mean | 3857 | 12 | 15 | 14 | 32 | 36 | 35 |
| st. dev. | 3640 | 15 | 14 | 15 | 33 | 54 | 35 |
| 95% UCL on mean | 7260 | 18 | 21 | 21 | 46 | 59 | 49 |
| max value | 15000 | 51 | 42 | 44 | 110 | 210 | 120 |
| **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise** | 200,000 DE, GW & River Protection | 15 ug/kg GW & River Protection | 15 ug/kg GW & River Protection | 15 ug/kg GW & River Protection | 18,000 River Protection | 48,000 GW Protection | 48,000 GW Protection |
| **WAC 173-340 3-PART TEST** | | | | | | | |
| 95% UCL > Cleanup Limit? | NO | YES | YES | YES | NO | NO | NO |
| > 10% above Cleanup Limit? | NO | YES | YES | YES | NO | NO | NO |
| Any sample > 2X Cleanup Limit? | NO | YES | YES | YES | NO | NO | NO |
| **WAC 173-340 Compliance?** | The data set meets the 3-part test criteria when compared to the most stringent RAG. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure 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. |

**MAXIMUM VALUE 3-PART TEST CALCULATION SHEET**

***Washington Closure Hanford***

**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 21 of 43

1 **100-H-28:2 and 100-H-42 Waste Sites Maximum Calculations**
2 **Verification Data - Staging Pile Area**

| 3 | Sample | Sample | Sample | Antimony | | | Hexavalent Chromium | | | Molybdenum | | | Silver | | | Nitrogen in Nitrate | | | Nitrogen in Nitrite and Nitrate | | | 4,4-DDE | | | 4,4-DDT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Area | Number | Date | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 5 | SPA-1 | J1V4L5 | 2/26/15 | 0.41 | B | 0.34 | 0.305 | | 0.155 | 0.23 | U | 0.23 | 0.14 | U | 0.14 | 0.79 | BJ | 0.31 | 0.37 | U | 0.37 | 0.23 | U | 0.23 | 0.57 | U | 0.57 |
| 6 | Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 0.36 | U | 0.36 | 0.240 | | 0.155 | 0.24 | U | 0.24 | 0.15 | U | 0.15 | 0.32 | UR | 0.32 | 0.36 | U | 0.36 | 0.24 | U | 0.24 | 0.58 | U | 0.58 |
| 7 | SPA-2 | J1V4L6 | 2/26/15 | 0.35 | U | 0.35 | 0.155 | U | 0.155 | 0.24 | U | 0.24 | 0.15 | U | 0.15 | 1.7 | BMJ | 0.31 | 0.55 | B | 0.36 | 0.24 | U | 0.24 | 0.59 | U | 0.59 |
| 8 | SPA-3 | J1V4L7 | 2/26/15 | 0.34 | U | 0.34 | 0.280 | | 0.155 | 0.23 | U | 0.23 | 0.14 | U | 0.14 | 0.82 | BJ | 0.31 | 0.37 | U | 0.37 | 0.23 | U | 0.23 | 0.57 | U | 0.57 |
| 9 | SPA-4 | J1V4L8 | 2/26/15 | 0.36 | U | 0.36 | 0.258 | | 0.155 | 0.24 | U | 0.24 | 0.15 | U | 0.15 | 1.1 | BJ | 0.31 | 0.36 | U | 0.36 | 0.24 | U | 0.24 | 0.59 | U | 0.59 |
| 10 | SPA-5 | J1V4L9 | 2/26/15 | 0.34 | U | 0.34 | 0.155 | U | 0.155 | 0.23 | U | 0.23 | 0.14 | U | 0.14 | 0.97 | BJ | 0.30 | 0.35 | U | 0.35 | 0.24 | U | 0.24 | 0.59 | U | 0.59 |
| 11 | SPA-6 | J1V4M0 | 2/26/15 | 0.42 | B | 0.36 | 0.192 | | 0.155 | 0.25 | U | 0.25 | 0.15 | U | 0.15 | 0.32 | UR | 0.32 | 0.35 | U | 0.35 | 0.24 | U | 0.24 | 0.59 | U | 0.59 |
| 12 | SPA-7 | J1V4M1 | 2/26/15 | 0.50 | B | 0.34 | 0.155 | U | 0.155 | 0.29 | B | 0.24 | 0.14 | U | 0.14 | 1.8 | BJ | 0.32 | 0.96 | | 0.37 | 0.24 | U | 0.24 | 0.60 | U | 0.60 |
| 13 | SPA-8 | J1V4M2 | 2/26/15 | 0.37 | U | 0.37 | 0.282 | | 0.155 | 0.25 | U | 0.25 | 0.15 | U | 0.15 | 4.7 | J | 0.33 | 4.2 | | 0.37 | 0.23 | U | 0.23 | 0.57 | U | 0.57 |
| 14 | SPA-9 | J1V4M3 | 2/26/15 | 0.39 | B | 0.37 | 0.155 | U | 0.155 | 0.26 | U | 0.26 | 0.16 | U | 0.16 | 0.76 | BJ | 0.31 | 0.37 | U | 0.37 | 0.23 | U | 0.23 | 0.58 | U | 0.58 |
| 15 | SPA-10 | J1V4M4 | 2/26/15 | 0.36 | U | 0.36 | 0.176 | | 0.155 | 0.25 | U | 0.25 | 0.15 | U | 0.15 | 1.1 | BJ | 0.32 | 0.37 | U | 0.37 | 0.24 | U | 0.24 | 0.59 | U | 0.59 |
| 16 | SPA-11 | J1V4M5 | 4/2/15 | 0.33 | U | 0.33 | 0.155 | U | 0.155 | 0.23 | U | 0.23 | 0.14 | U | 0.14 | 0.95 | BJ | 0.32 | 0.36 | UN | 0.36 | 0.24 | U | 0.24 | 0.60 | U | 0.60 |
| 17 | SPA-12 | J1V4M6 | 4/2/15 | 0.34 | U | 0.34 | 0.256 | | 0.155 | 0.23 | U | 0.23 | 0.14 | B | 0.14 | 7.6 | J | 0.32 | 6.8 | | 0.38 | 0.25 | U | 0.25 | 0.62 | U | 0.62 |
| 18 | SPA-13 | J1V4M7 | 2/26/15 | 0.37 | U | 0.37 | 0.155 | U | 0.155 | 0.25 | U | 0.25 | 0.16 | U | 0.16 | 2.6 | J | 0.33 | 1.7 | | 0.38 | 0.25 | U | 0.25 | 0.61 | U | 0.61 |
| 19 | SPA-14 | J1V4M8 | 2/26/15 | 0.36 | U | 0.36 | 0.155 | U | 0.155 | 0.24 | U | 0.24 | 0.15 | U | 0.15 | 1.0 | BJ | 0.31 | 0.36 | U | 0.36 | 0.24 | U | 0.24 | 0.59 | U | 0.59 |
| 20 | SPA-15 | J1V4M9 | 4/2/15 | 0.37 | U | 0.37 | 0.155 | U | 0.155 | 0.25 | U | 0.25 | 0.15 | U | 0.15 | 15.2 | J | 0.32 | 2.5 | | 0.37 | 1.7 | N | 0.24 | 2.7 | NX | 0.61 |

21 **3-Part Test Evaluations**

| 22 | | Antimony | Hexavalent Chromium | Molybdenum | Silver | Nitrogen in Nitrate | Nitrogen in Nitrite and Nitrate | 4,4-DDE | 4,4-DDT |
|---|---|---|---|---|---|---|---|---|---|
| 23 | % < Detection limit | 73% | 53% | 93% | 93% | 0% | 60% | 93% | 93% |
| 24 | Maximum value | 0.50 | 0.305 | 0.29 | 0.14 | 15.2 | 6.8 | 1.7 | 2.7 |
| 25 | **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise** | 5 GW Protection | 2 River Protection | 8 GW Protection | 0.73 River Protection | 1000 GW Protection | 1000 GW Protection | 3.3 ug/kg River Protection | 3.3 ug/kg River Protection |
| 26 | **3-PART TEST** | | | | | | | | |
| 27 | Maximum > Cleanup Limit? | NA | NO | NO | NA | NO | NA | NO | NO |
| 28 | > 10% above Cleanup Limit? | NA | NO | NO | NA | NO | NA | NO | NO |
| 29 | Any sample > 2X Cleanup Limit? | NA | NO | NO | NA | NO | NA | NO | NO |
| 30 | **3-Part Test Compliance?** | Because all values are below background (5 mg/kg) the 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. | Because all values are below background (0.73 mg/kg) the 3-part test is not required. | The data set meets the 3-part test criteria when compared to the most stringent RAG. | Because all values are below background (11.8 mg/kg) the 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. |

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***Washington Closure Hanford***

**Originator** I. B. Berezovskiy **Date** 07/13/15 **Calc. No.** 0100H-CA-V0230 **Rev. No.** 0
**Project** 100-H Area Closure Operations **Job No.** 14655 **Checked** J. D. Skoglie **Date** 07/13/15
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations **Sheet No.** 22 of 43

**100-H-28:2 and 100-H-42 Waste Sites Maximum Calculations**
**Verification Data - Staging Pile Area**

| Sample Area | Sample Number | Sample Date | Aroclor-1254 | | | Aroclor-1260 | | | Acenaphthene (Method 8270) | | | Acenaphthene (Method 8310) | | | Anthracene (Method 8270) | | | Benzo(a)anthracene (Method 8270) | | | Benzo(a)pyrene (Method 8270) | | | Benzo(b)fluoranthene (Method 8270) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| SPA-1 | J1V4L5 | 2/26/15 | 2.6 | U | 2.6 | 2.6 | U | 2.6 | 11 | U | 11 | 10 | UN | 10 | 17 | U | 17 | 20 | U | 20 | 20 | U | 20 | 27 | U | 27 |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 2.6 | U | 2.6 | 2.6 | U | 2.6 | 10 | U | 10 | 9.9 | U | 9.9 | 17 | U | 17 | 20 | U | 20 | 20 | U | 20 | 26 | U | 26 |
| SPA-2 | J1V4L6 | 2/26/15 | 2.6 | U | 2.6 | 2.6 | U | 2.6 | 10 | U | 10 | 10 | U | 10 | 17 | U | 17 | 19 | U | 19 | 19 | U | 19 | 25 | U | 25 |
| SPA-3 | J1V4L7 | 2/26/15 | 2.5 | U | 2.5 | 2.5 | U | 2.5 | 11 | U | 11 | 10 | U | 10 | 17 | U | 17 | 21 | U | 21 | 21 | U | 21 | 27 | U | 27 |
| SPA-4 | J1V4L8 | 2/26/15 | 2.5 | U | 2.5 | 2.5 | U | 2.5 | 11 | J | 11 | 10 | U | 10 | 26 | J | 17 | 88 | J | 21 | 83 | J | 21 | 140 | JX | 27 |
| SPA-5 | J1V4L9 | 2/26/15 | 2.6 | U | 2.6 | 2.6 | U | 2.6 | 10 | U | 10 | 9.8 | U | 9.8 | 17 | U | 17 | 20 | U | 20 | 20 | U | 20 | 26 | U | 26 |
| SPA-6 | J1V4M0 | 2/26/15 | 2.6 | U | 2.6 | 2.6 | U | 2.6 | 10 | U | 10 | 9.5 | U | 9.5 | 17 | U | 17 | 20 | U | 20 | 20 | U | 20 | 27 | U | 27 |
| SPA-7 | J1V4M1 | 2/26/15 | 2.6 | U | 2.6 | 12 | | 2.6 | 10 | U | 10 | 15 | JX | 10 | 17 | U | 17 | 20 | U | 20 | 20 | U | 20 | 27 | U | 27 |
| SPA-8 | J1V4M2 | 2/26/15 | 2.8 | U | 2.8 | 2.8 | U | 2.8 | 11 | U | 11 | 10 | U | 10 | 18 | U | 18 | 21 | U | 21 | 21 | U | 21 | 28 | U | 28 |
| SPA-9 | J1V4M3 | 2/26/15 | 2.6 | U | 2.6 | 2.6 | U | 2.6 | 11 | U | 11 | 27 | J | 10 | 18 | U | 18 | 21 | U | 21 | 21 | U | 21 | 27 | U | 27 |
| SPA-10 | J1V4M4 | 2/26/15 | 46 | | 2.5 | 2.5 | U | 2.5 | 11 | U | 11 | 11 | JX | 10 | 17 | U | 17 | 20 | U | 20 | 20 | U | 20 | 27 | U | 27 |
| SPA-11 | J1V4M5 | 4/2/15 | 2.6 | U | 2.6 | 2.6 | U | 2.6 | 9.8 | U | 9.8 | 10 | U | 10 | 16 | U | 16 | 19 | U | 19 | 19 | U | 19 | 25 | U | 25 |
| SPA-12 | J1V4M6 | 4/2/15 | 2.7 | U | 2.7 | 2.7 | U | 2.7 | 11 | U | 11 | 11 | U | 11 | 18 | U | 18 | 21 | U | 21 | 21 | U | 21 | 27 | U | 27 |
| SPA-13 | J1V4M7 | 2/26/15 | 2.8 | U | 2.8 | 5.8 | J | 2.8 | 11 | U | 11 | 10 | U | 10 | 18 | U | 18 | 21 | U | 21 | 21 | U | 21 | 28 | U | 28 |
| SPA-14 | J1V4M8 | 2/26/15 | 2.5 | U | 2.5 | 2.5 | U | 2.5 | 10 | U | 10 | 9.8 | U | 9.8 | 17 | U | 17 | 27 | J | 20 | 20 | U | 20 | 27 | U | 27 |
| SPA-15 | J1V4M9 | 4/2/15 | 2.5 | U | 2.5 | 48 | | 2.5 | 11 | UX | 11 | 10 | U | 10 | 18 | UX | 18 | 32 | JX | 21 | 30 | JX | 21 | 38 | JX | 27 |

**3-Part Test Evaluations**

| | Aroclor-1254 | Aroclor-1260 | Acenaphthene (Method 8270) | Acenaphthene (Method 8310) | Anthracene (Method 8270) | Benzo(a)anthracene (Method 8270) | Benzo(a)pyrene (Method 8270) | Benzo(b)fluoranthene (Method 8270) |
|---|---|---|---|---|---|---|---|---|
| % < Detection limit | 93% | 80% | 93% | 80% | 93% | 80% | 87% | 87% |
| Maximum value | 46 | 48 | 11 | 27 | 26 | 88 | 83 | 140 |
| **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise** | 17 ug/kg GW & River Protection | 17 ug/kg GW & River Protection | 96,000 ug/kg GW Protection | 96,000 ug/kg GW Protection | 240,000 ug/kg GW Protection | 15 ug/kg GW & River Protection | 15 ug/kg GW & River Protection | 15 ug/kg GW & River Protection |
| **3-PART TEST** | | | | | | | | |
| Maximum > Cleanup Limit? | YES | YES | NO | NO | NO | YES | YES | YES |
| > 10% above Cleanup Limit? | NO | NO | NO | NO | NO | YES | NO | YES |
| Any sample > 2X Cleanup Limit? | YES | YES | NO | NO | NO | YES | YES | YES |
| **3-Part Test Compliance?** | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure 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. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. |

**MAXIMUM VALUE 3-PART TEST CALCULATION SHEET**

***Washington Closure Hanford***

**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 23 of 43

1 **100-H-28:2 and 100-H-42 Waste Sites Maximum Calculations**
2 **Verification Data - Staging Pile Area**

| 3 | Sample | Sample | Sample | Benzo(ghi)perylene (Method 8270) | | | Benzo(ghi)perylene (Method 8310) | | | Benzo(k)fluoranthene (Method 8310) | | | Chrysene (Method 8270) | | | Chrysene (Method 8310) | | | Dibenz(a,h)anthracene (Method 8310) | | | Fluoranthene (Method 8270) | | | Fluorene (Method 8310) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Area | Number | Date | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 5 | SPA-1 | J1V4L5 | 2/26/15 | 16 | U | 16 | 7.3 | U | 7.3 | 4.0 | UN | 4.0 | 28 | U | 28 | 4.9 | UN | 4.9 | 11 | UN | 11 | 37 | U | 37 | 5.4 | UN | 5.4 |
| 6 | Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 16 | U | 16 | 7.2 | U | 7.2 | 3.9 | U | 3.9 | 27 | U | 27 | 4.8 | U | 4.8 | 11 | U | 11 | 36 | U | 36 | 5.3 | U | 5.3 |
| 7 | SPA-2 | J1V4L6 | 2/26/15 | 16 | U | 16 | 7.2 | U | 7.2 | 4.0 | U | 4.0 | 26 | U | 26 | 4.9 | U | 4.9 | 11 | U | 11 | 35 | U | 35 | 5.3 | U | 5.3 |
| 8 | SPA-3 | J1V4L7 | 2/26/15 | 16 | U | 16 | 7.2 | U | 7.2 | 3.9 | U | 3.9 | 28 | U | 28 | 4.8 | U | 4.8 | 11 | U | 11 | 37 | U | 37 | 5.3 | U | 5.3 |
| 9 | SPA-4 | J1V4L8 | 2/26/15 | 53 | J | 16 | 7.3 | U | 7.3 | 4.6 | J | 4.0 | 100 | J | 28 | 14 | J | 4.9 | 11 | U | 11 | 190 | J | 37 | 5.3 | U | 5.3 |
| 10 | SPA-5 | J1V4L9 | 2/26/15 | 16 | U | 16 | 7.0 | U | 7.0 | 3.9 | U | 3.9 | 27 | U | 27 | 4.7 | U | 4.7 | 11 | U | 11 | 36 | U | 36 | 5.2 | U | 5.2 |
| 11 | SPA-6 | J1V4M0 | 2/26/15 | 16 | U | 16 | 6.9 | U | 6.9 | 3.8 | U | 3.8 | 27 | U | 27 | 4.6 | U | 4.6 | 10 | U | 10 | 37 | U | 37 | 5.0 | U | 5.0 |
| 12 | SPA-7 | J1V4M1 | 2/26/15 | 16 | U | 16 | 24 | J | 7.4 | 14 | J | 4.1 | 27 | U | 27 | 43 | | 5.0 | 11 | U | 11 | 37 | J | 37 | 11 | J | 5.4 |
| 13 | SPA-8 | J1V4M2 | 2/26/15 | 17 | U | 17 | 7.3 | U | 7.3 | 4.0 | U | 4.0 | 29 | U | 29 | 4.9 | U | 4.9 | 11 | U | 11 | 38 | U | 38 | 5.4 | U | 5.4 |
| 14 | SPA-9 | J1V4M3 | 2/26/15 | 17 | U | 17 | 23 | J | 7.2 | 19 | | 4.0 | 28 | U | 28 | 56 | | 4.9 | 11 | U | 11 | 37 | U | 37 | 19 | J | 5.3 |
| 15 | SPA-10 | J1V4M4 | 2/26/15 | 16 | U | 16 | 17 | J | 7.3 | 9.5 | JX | 4.0 | 28 | U | 28 | 26 | J | 4.9 | 15 | J | 11 | 37 | U | 37 | 5.4 | U | 5.4 |
| 16 | SPA-11 | J1V4M5 | 4/2/15 | 15 | U | 15 | 7.2 | U | 7.2 | 3.9 | U | 3.9 | 26 | U | 26 | 4.8 | U | 4.8 | 11 | U | 11 | 34 | U | 34 | 5.3 | U | 5.3 |
| 17 | SPA-12 | J1V4M6 | 4/2/15 | 17 | U | 17 | 24 | J | 7.6 | 7.7 | J | 4.2 | 28 | U | 28 | 22 | J | 5.1 | 12 | U | 12 | 40 | J | 38 | 5.6 | U | 5.6 |
| 18 | SPA-13 | J1V4M7 | 2/26/15 | 17 | U | 17 | 14 | J | 7.4 | 9.7 | J | 4.1 | 29 | U | 29 | 18 | J | 5.0 | 11 | U | 11 | 38 | U | 38 | 5.4 | U | 5.4 |
| 19 | SPA-14 | J1V4M8 | 2/26/15 | 16 | U | 16 | 7.1 | U | 7.1 | 3.9 | U | 3.9 | 38 | J | 27 | 4.7 | U | 4.7 | 11 | U | 11 | 61 | J | 36 | 5.2 | U | 5.2 |
| 20 | SPA-15 | J1V4M9 | 4/2/15 | 25 | JX | 17 | 41 | | 7.5 | 13 | J | 4.1 | 37 | JX | 28 | 48 | | 5.0 | 11 | U | 11 | 57 | JX | 37 | 5.5 | U | 5.5 |

21 **3-Part Test Evaluations**

| 22 | | Benzo(ghi)perylene (Method 8270) | Benzo(ghi)perylene (Method 8310) | Benzo(k)fluoranthene (Method 8310) | Chrysene (Method 8270) | Chrysene (Method 8310) | Dibenz(a,h)anthracene (Method 8310) | Fluoranthene (Method 8270) | Fluorene (Method 8310) |
|---|---|---|---|---|---|---|---|---|---|
| 23 | % < Detection limit | 87% | 60% | 53% | 80% | 53% | 93% | 67% | 87% |
| 24 | Maximum value | 53 | 41 | 19 | 100 | 56 | 15 | 190 | 19 |
| 25 | **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise** | 48,000 ug/kg GW Protection | 48,000 ug/kg GW Protection | 15 ug/kg GW & River Protection | 100 ug/kg River Protection | 100 ug/kg River Protection | 30 ug/kg GW & River Protection | 18,000 ug/kg River Protection | 64,000 ug/kg GW Protection |
| 26 | **3-PART TEST** | | | | | | | | |
| 27 | Maximum > Cleanup Limit? | NO | NO | YES | NO | NO | NO | NO | NO |
| 28 | > 10% above Cleanup Limit? | NO | NO | NO | NO | NO | NO | NO | NO |
| 29 | Any sample > 2X Cleanup Limit? | NO | NO | NO | NO | NO | NO | NO | NO |
| 30 | **3-Part Test Compliance?** | 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. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure 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. | 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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**MAXIMUM VALUE 3-PART TEST CALCULATION SHEET**

***Washington Closure Hanford***

**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 24 of 43

**100-H-28:2 and 100-H-42 Waste Sites Maximum Calculations**
**Verification Data - Staging Pile Area**

| Sample Area | Sample Number | Sample Date | Indeno(1,2,3-cd)pyrene (Method 8270) | | | Indeno (1,2,3-cd) pyrene (Method 8310) | | | Phenanthrene (Method 8270) | | | Phenanthrene (Method 8310) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| SPA-1 | J1V4L5 | 2/26/15 | 23 | U | 23 | 12 | U | 12 | 17 | U | 17 | 12 | UN | 12 |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 22 | U | 22 | 12 | U | 12 | 17 | U | 17 | 12 | U | 12 |
| SPA-2 | J1V4L6 | 2/26/15 | 21 | U | 21 | 12 | U | 12 | 17 | U | 17 | 12 | U | 12 |
| SPA-3 | J1V4L7 | 2/26/15 | 23 | U | 23 | 12 | U | 12 | 17 | U | 17 | 12 | U | 12 |
| SPA-4 | J1V4L8 | 2/26/15 | 51 | J | 23 | 16 | J | 12 | 150 | J | 17 | 16 | J | 12 |
| SPA-5 | J1V4L9 | 2/26/15 | 22 | U | 22 | 12 | U | 12 | 17 | U | 17 | 12 | U | 12 |
| SPA-6 | J1V4M0 | 2/26/15 | 22 | U | 22 | 11 | U | 11 | 17 | U | 17 | 11 | U | 11 |
| SPA-7 | J1V4M1 | 2/26/15 | 22 | U | 22 | 16 | JX | 12 | 24 | J | 17 | 53 | 0 | 12 |
| SPA-8 | J1V4M2 | 2/26/15 | 23 | U | 23 | 12 | U | 12 | 18 | U | 18 | 12 | U | 12 |
| SPA-9 | J1V4M3 | 2/26/15 | 23 | U | 23 | 12 | U | 12 | 18 | U | 18 | 130 | | 12 |
| SPA-10 | J1V4M4 | 2/26/15 | 22 | U | 22 | 22 | J | 12 | 20 | J | 17 | 37 | J | 12 |
| SPA-11 | J1V4M5 | 4/2/15 | 21 | U | 21 | 12 | U | 12 | 16 | U | 16 | 12 | U | 12 |
| SPA-12 | J1V4M6 | 4/2/15 | 23 | U | 23 | 18 | JX | 13 | 24 | J | 18 | 34 | J | 13 |
| SPA-13 | J1V4M7 | 2/26/15 | 23 | U | 23 | 13 | JX | 12 | 18 | U | 18 | 17 | J | 12 |
| SPA-14 | J1V4M8 | 2/26/15 | 22 | U | 22 | 12 | U | 12 | 58 | J | 17 | 12 | U | 12 |
| SPA-15 | J1V4M9 | 4/2/15 | 23 | UX | 23 | 30 | J | 12 | 31 | JX | 18 | 41 | | 12 |

**3-Part Test Evaluations**

| | Indeno(1,2,3-cd)pyrene (Method 8270) | Indeno (1,2,3-cd) pyrene (Method 8310) | Phenanthrene (Method 8270) | Phenanthrene (Method 8310) |
|---|---|---|---|---|
| % < Detection limit | 93% | 60% | 60% | 53% |
| Maximum value | 51 | 30 | 150 | 130 |
| **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise** | 330 ug/kg GW & River Protection | 330 ug/kg GW & River Protection | 240,000 ug/kg GW Protection | 240,000 ug/kg GW Protection |
| **3-PART TEST** | | | | |
| Maximum > Cleanup Limit? | NO | NO | NO | NO |
| > 10% above Cleanup Limit? | NO | NO | NO | NO |
| Any sample > 2X Cleanup Limit? | NO | NO | NO | NO |
| **3-Part Test Compliance?** | 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. |

**CALCULATION SHEET**

***Washington Closure Hanford***

**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 25 of 43

1 **100-H-28:2 and 100-H-42 Waste Sites Statistical Calculations**
2 **Verification Data - Overburden**

| 3 | Sample | Sample | Sample | Arsenic | | | Barium | | | Cadmium | | | Chromium | | | Cobalt | | | Copper | | | Hexavalent Chromium | | | 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 | mg/kg | Q | PQL |
| 5 | OVB-9[a] | J1V4N1 | 2/26/15 | 4.9 | | 0.62 | 43.9 | | 0.071 | 0.15 | B | 0.038 | 10.9 | X | 0.054 | 6.1 | X | 0.093 | 12.7 | | 0.2 | 0.314 | | 0.155 | 13.5 | X | 0.25 | 248 | X | 0.093 |
| 6 | Duplicate of J1V4N1[a] | J1V4N3 | 2/26/15 | 5.0 | | 0.62 | 42.5 | | 0.072 | 0.15 | B | 0.039 | 9.9 | X | 0.055 | 5.7 | X | 0.095 | 13.2 | | 0.21 | 0.295 | | 0.155 | 13.5 | X | 0.26 | 230 | X | 0.095 |
| 7 | OVB-1 | J1V255 | 12/10/14 | 4.9 | | 0.66 | 58.7 | | 0.076 | 0.064 | B | 0.041 | 8.3 | MN | 0.058 | 4.9 | M | 0.10 | 13.0 | | 0.22 | 0.233 | | 0.155 | 14.4 | | 0.27 | 212 | | 0.10 |
| 8 | OVB-2 | J1V256 | 12/10/14 | 4.0 | | 0.65 | 66.9 | | 0.075 | 0.11 | B | 0.040 | 13.8 | | 0.057 | 6.2 | | 0.098 | 15.1 | | 0.21 | 0.320 | | 0.155 | 6.5 | | 0.27 | 262 | | 0.098 |
| 9 | OVB-3 | J1V257 | 12/10/14 | 8.2 | | 0.66 | 55.1 | | 0.076 | 0.067 | B | 0.041 | 9.6 | | 0.058 | 5.8 | | 0.10 | 14.2 | | 0.22 | 0.276 | | 0.155 | 24.2 | | 0.27 | 242 | | 0.10 |
| 10 | OVB-4 | J1V258 | 12/10/14 | 6.9 | | 0.61 | 53.2 | | 0.070 | 0.042 | B | 0.038 | 24.4 | | 0.053 | 5.8 | | 0.092 | 19.2 | | 0.20 | 0.607 | | 0.155 | 14.8 | | 0.25 | 255 | | 0.092 |
| 11 | OVB-5 | J1V259 | 12/10/14 | 3.9 | | 0.64 | 52.3 | | 0.074 | 0.075 | B | 0.040 | 13.7 | | 0.056 | 6.2 | | 0.097 | 18.7 | | 0.21 | 0.273 | | 0.155 | 6.7 | | 0.26 | 317 | | 0.097 |
| 12 | OVB-6 | J1V260 | 12/10/14 | 15.8 | | 0.66 | 54.5 | | 0.075 | 0.041 | U | 0.041 | 10.0 | | 0.058 | 6.7 | | 0.099 | 14.8 | | 0.22 | 0.318 | | 0.155 | 53.5 | | 0.27 | 285 | | 0.099 |
| 13 | OVB-7 | J1V261 | 12/10/14 | 5.2 | | 0.60 | 47.7 | | 0.070 | 0.088 | B | 0.037 | 12.1 | | 0.053 | 5.7 | | 0.091 | 14.2 | | 0.20 | 0.319 | | 0.155 | 13.3 | | 0.25 | 248 | | 0.091 |
| 14 | OVB-8 | J1V262 | 12/10/14 | 7.2 | | 0.60 | 39.1 | | 0.070 | 0.038 | B | 0.038 | 8.3 | | 0.053 | 5.6 | | 0.092 | 15.0 | | 0.20 | 0.274 | | 0.155 | 24.8 | | 0.25 | 244 | | 0.092 |
| 15 | OVB-10 | J1V264 | 12/10/14 | 8.5 | | 0.68 | 47.2 | | 0.078 | 0.053 | B | 0.042 | 8.8 | | 0.060 | 5.9 | | 0.10 | 15.6 | | 0.22 | 0.341 | | 0.155 | 26.3 | | 0.28 | 262 | | 0.10 |
| 16 | OVB-11 | J1V265 | 12/10/14 | 6.4 | | 0.65 | 44.5 | | 0.075 | 0.049 | B | 0.041 | 8.6 | | 0.057 | 5.4 | | 0.099 | 12.4 | | 0.22 | 0.249 | | 0.155 | 18.6 | | 0.27 | 227 | | 0.099 |
| 17 | OVB-12[a] | J1V4N2 | 2/26/15 | 5.5 | | 0.64 | 52.9 | | 0.074 | 0.17 | B | 0.040 | 10.9 | X | 0.056 | 7.3 | X | 0.097 | 14.1 | | 0.21 | 0.315 | | 0.155 | 16.2 | X | 0.26 | 265 | X | 0.097 |

18 **Statistical Computation Input Data**

| 19 | Sample | Sample | Sample | Arsenic | Barium | Cadmium | Chromium | Cobalt | Copper | Hexavalent Chromium | Lead | Manganese |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | Area | Number | Date | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| 21 | OVB-9[a] | J1V4N1/ J1V4N3 | 2/26/15 | 5.0 | 43.2 | 0.15 | 10.4 | 5.9 | 13.0 | 0.305 | 13.5 | 239 |
| 22 | OVB-1 | J1V255 | 12/10/14 | 4.9 | 58.7 | 0.064 | 8.3 | 4.9 | 13.0 | 0.233 | 14.4 | 212 |
| 23 | OVB-2 | J1V256 | 12/10/14 | 4.0 | 66.9 | 0.11 | 13.8 | 6.2 | 15.1 | 0.320 | 6.5 | 262 |
| 24 | OVB-3 | J1V257 | 12/10/14 | 8.2 | 55.1 | 0.067 | 9.6 | 5.8 | 14.2 | 0.276 | 24.2 | 242 |
| 25 | OVB-4 | J1V258 | 12/10/14 | 6.9 | 53.2 | 0.042 | 24.4 | 5.8 | 19.2 | 0.607 | 14.8 | 255 |
| 26 | OVB-5 | J1V259 | 12/10/14 | 3.9 | 52.3 | 0.075 | 13.7 | 6.2 | 18.7 | 0.273 | 6.7 | 317 |
| 27 | OVB-6 | J1V260 | 12/10/14 | 15.8 | 54.5 | 0.021 | 10.0 | 6.7 | 14.8 | 0.318 | 53.5 | 285 |
| 28 | OVB-7 | J1V261 | 12/10/14 | 5.2 | 47.7 | 0.088 | 12.1 | 5.7 | 14.2 | 0.319 | 13.3 | 248 |
| 29 | OVB-8 | J1V262 | 12/10/14 | 7.2 | 39.1 | 0.038 | 8.3 | 5.6 | 15.0 | 0.274 | 24.8 | 244 |
| 30 | OVB-10 | J1V264 | 12/10/14 | 8.5 | 47.2 | 0.053 | 8.8 | 5.9 | 15.6 | 0.341 | 26.3 | 262 |
| 31 | OVB-11 | J1V265 | 12/10/14 | 6.4 | 44.5 | 0.049 | 8.6 | 5.4 | 12.4 | 0.249 | 18.6 | 227 |
| 32 | OVB-12[a] | J1V4N2 | 2/26/15 | 5.5 | 52.9 | 0.17 | 10.9 | 7.3 | 14.1 | 0.315 | 16.2 | 265 |

33 **Statistical Computations**

| 34 | | Arsenic | Barium | Cadmium | Chromium | Cobalt | Copper | Hexavalent Chromium | Lead | Manganese |
|---|---|---|---|---|---|---|---|---|---|---|
| 35 | 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), 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), 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. |
| 36 | N | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| 37 | % < Detection limit | 0% | 0% | 8% | 0% | 0% | 0% | 0% | 0% | 0% |
| 38 | Mean | 6.8 | 51.3 | 0.077 | 11.6 | 6.0 | 14.9 | 0.319 | 19.4 | 255 |
| 39 | Standard deviation | 3.2 | 7.5 | 0.045 | 4.5 | 0.61 | 2.1 | 0.096 | 12.5 | 27.3 |
| 40 | 95% UCL on mean | 8.6 | 55.6 | 0.12 | 13.7 | 6.3 | 16.1 | 0.365 | 29.1 | 270 |
| 41 | Maximum value | 15.8 | 66.9 | 0.17 | 24.4 | 7.3 | 19.2 | 0.607 | 53.5 | 317 |
| 42 | **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)** | 20 DE, GW & River Protection | 200 GW Protection | 0.81 GW & River Protection | 18.5 GW & River Protection | 15.7 GW Protection | 22.0 River Protection | 2.0 River Protection | 10.2 GW & River Protection | 512 GW & River Protection |
| 43 | **WAC 173-340 3-PART TEST** | | | | | | | | | |
| 44 | 95% UCL > Cleanup Limit? | NO | NA | NA | NO | NA | NA | NO | YES | NA |
| 45 | > 10% above Cleanup Limit? | NO | NA | NA | NO | NA | NA | NO | YES | NA |
| 46 | Any sample > 2X Cleanup Limit? | NO | NA | NA | NO | NA | NA | NO | YES | NA |
| 47 | **WAC 173-340 Compliance?** | The data set meets the 3-part test criteria when compared to the most stringent RAG. | 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 (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. | 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. | The data set meets the 3-part test criteria when compared to the most stringent RAG. | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | Because all values are below background (512 mg/kg) the WAC 173-340 3-part test is not required. |

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**CALCULATION SHEET**

*Washington Closure Hanford*

**Originator** I. B. Berezovskiy **Date** 07/13/15 **Calc. No.** 0100H-CA-V0230 **Rev. No.** 0
**Project** 100-H Area Closure Operations **Job No.** 14655 **Checked** J. D. Skoglie **Date** 07/13/15
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations **Sheet No.** 26 of 43

1 **100-H-28:2 and 100-H-42 Waste Sites Statistical Calculations**

2 **Verification Data - Overburden**

| 3 | Sample | Sample | Sample | Mercury | | | Nickel | | | Vanadium | | | Zinc | | | Chloride | | | Fluoride | | | Nitrogen in nitrate and nitrite | | | Sulfate | | | TPH - Diesel EXT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | ug/kg | Q | PQL |
| 5 | OVB-9[a] | J1V4N1 | 2/26/15 | 0.0069 | U | 0.0069 | 10.6 | X | 0.11 | 41.2 | | 0.088 | 32.6 | X | 0.37 | 8.6 | C | 2.0 | 1.1 | B | 0.84 | 0.54 | B | 0.37 | 9.8 | | 1.7 | 4000 | J | 1000 |
| 6 | Duplicate of J1V4N1[a] | J1V4N3 | 2/26/15 | 0.0061 | U | 0.0061 | 9.5 | X | 0.12 | 39.6 | | 0.089 | 30.5 | X | 0.38 | 8.6 | C | 2.0 | 1.1 | B | 0.82 | 0.50 | B | 0.37 | 10.0 | | 1.7 | 4400 | | 970 |
| 7 | OVB-1 | J1V255 | 12/10/14 | 0.0087 | B | 0.0056 | 7.8 | MN | 0.12 | 31.9 | | 0.094 | 28.4 | | 0.40 | 8.4 | N | 2.1 | 1.0 | B | 0.86 | 0.39 | U | 0.39 | 13.5 | | 1.8 | 1500 | J | 1100 |
| 8 | OVB-2 | J1V256 | 12/10/14 | 0.0063 | B | 0.0056 | 12.9 | | 0.12 | 42.8 | | 0.092 | 39.9 | | 0.39 | 27.0 | | 2.1 | 1.1 | B | 0.86 | 0.39 | U | 0.39 | 40.4 | | 1.8 | 5600 | | 1000 |
| 9 | OVB-3 | J1V257 | 12/10/14 | 0.0077 | B | 0.0054 | 10.0 | | 0.12 | 39.6 | | 0.094 | 35.4 | | 0.40 | 8.9 | | 2.0 | 1.3 | B | 0.83 | 2.4 | | 0.38 | 25.8 | | 1.7 | 4200 | J | 1100 |
| 10 | OVB-4 | J1V258 | 12/10/14 | 0.0088 | B | 0.0056 | 10.1 | | 0.11 | 39.8 | | 0.087 | 36.3 | | 0.37 | 7.3 | | 2.1 | 0.97 | B | 0.85 | 0.45 | B | 0.37 | 9.8 | | 1.8 | 2300 | J | 990 |
| 11 | OVB-5 | J1V259 | 12/10/14 | 0.0077 | B | 0.0058 | 11.7 | | 0.12 | 41.7 | | 0.091 | 34.2 | | 0.39 | 7.2 | | 2.0 | 0.88 | B | 0.83 | 0.39 | U | 0.39 | 8.1 | | 1.7 | 2800 | J | 1100 |
| 12 | OVB-6 | J1V260 | 12/10/14 | 0.0084 | B | 0.0057 | 11.0 | | 0.12 | 43.8 | | 0.093 | 38.6 | | 0.40 | 7.2 | | 2.1 | 1.4 | B | 0.85 | 0.47 | B | 0.38 | 9.7 | | 1.8 | 2800 | J | 1000 |
| 13 | OVB-7 | J1V261 | 12/10/14 | 0.0066 | B | 0.0053 | 12.4 | | 0.11 | 39.8 | | 0.086 | 35.9 | | 0.36 | 7.1 | | 2.0 | 1.0 | B | 0.82 | 0.38 | U | 0.38 | 8.1 | | 1.7 | 3100 | J | 1000 |
| 14 | OVB-8 | J1V262 | 12/10/14 | 0.0052 | U | 0.0052 | 8.6 | | 0.11 | 33.0 | | 0.086 | 28.6 | | 0.36 | 10.6 | | 2.0 | 1.2 | B | 0.83 | 1.5 | | 0.38 | 15.8 | | 1.7 | 3000 | J | 1000 |
| 15 | OVB-10 | J1V264 | 12/10/14 | 0.0057 | U | 0.0057 | 8.9 | | 0.13 | 43.2 | | 0.097 | 34.9 | | 0.41 | 7.2 | | 2.0 | 1.2 | B | 0.83 | 0.70 | B | 0.38 | 8.3 | | 1.7 | 3200 | J | 1000 |
| 16 | OVB-11 | J1V265 | 12/10/14 | 0.0070 | B | 0.0057 | 9.2 | | 0.12 | 40.1 | | 0.093 | 33.9 | | 0.39 | 12.1 | | 2.0 | 1.1 | B | 0.84 | 1.3 | | 0.38 | 24.3 | | 1.7 | 2600 | J | 980 |
| 17 | OVB-12[a] | J1V4N2 | 2/26/15 | 0.0058 | U | 0.0058 | 11.2 | X | 0.12 | 45.9 | | 0.091 | 36.1 | X | 0.39 | 7.6 | C | 2.0 | 1.1 | B | 0.80 | 0.37 | U | 0.37 | 8.3 | | 1.7 | 7800 | | 1000 |

18 **Statistical Computation Input Data**

| 19 | Sample | Sample | Sample | Mercury | Nickel | Vanadium | Zinc | Chloride | Fluoride | Nitrogen in nitrate and nitrite | Sulfate | TPH - Diesel EXT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | Area | Number | Date | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | ug/kg |
| 21 | OVB-9[a] | J1V4N1/ J1V4N3 | 2/26/15 | 0.0033 | 10.1 | 40.4 | 31.6 | 8.6 | 1.1 | 0.52 | 9.9 | 4200 |
| 22 | OVB-1 | J1V255 | 12/10/14 | 0.0087 | 7.8 | 31.9 | 28.4 | 8.4 | 1.0 | 0.20 | 13.5 | 1500 |
| 23 | OVB-2 | J1V256 | 12/10/14 | 0.0063 | 12.9 | 42.8 | 39.9 | 27.0 | 1.1 | 0.20 | 40.4 | 5600 |
| 24 | OVB-3 | J1V257 | 12/10/14 | 0.0077 | 10.0 | 39.6 | 35.4 | 8.9 | 1.3 | 2.4 | 25.8 | 4200 |
| 25 | OVB-4 | J1V258 | 12/10/14 | 0.0088 | 10.1 | 39.8 | 36.3 | 7.3 | 0.97 | 0.45 | 9.8 | 2300 |
| 26 | OVB-5 | J1V259 | 12/10/14 | 0.0077 | 11.7 | 41.7 | 34.2 | 7.2 | 0.88 | 0.20 | 8.1 | 2800 |
| 27 | OVB-6 | J1V260 | 12/10/14 | 0.0084 | 11.0 | 43.8 | 38.6 | 7.2 | 1.4 | 0.47 | 9.7 | 2800 |
| 28 | OVB-7 | J1V261 | 12/10/14 | 0.0066 | 12.4 | 39.8 | 35.9 | 7.1 | 1.0 | 0.19 | 8.1 | 3100 |
| 29 | OVB-8 | J1V262 | 12/10/14 | 0.0026 | 8.6 | 33.0 | 28.6 | 10.6 | 1.2 | 1.5 | 15.8 | 3000 |
| 30 | OVB-10 | J1V264 | 12/10/14 | 0.0029 | 8.9 | 43.2 | 34.9 | 7.2 | 1.2 | 0.70 | 8.3 | 3200 |
| 31 | OVB-11 | J1V265 | 12/10/14 | 0.0070 | 9.2 | 40.1 | 33.9 | 12.1 | 1.1 | 1.3 | 24.3 | 2600 |
| 32 | OVB-12[a] | J1V4N2 | 2/26/15 | 0.0029 | 11.2 | 45.9 | 36.1 | 7.6 | 1.1 | 0.19 | 8.3 | 7800 |

33 **Statistical Computations**

| 34 | | Mercury | Nickel | Vanadium | Zinc | Chloride | Fluoride | Nitrogen in nitrate and nitrite | Sulfate | TPH - Diesel EXT |
|---|---|---|---|---|---|---|---|---|---|---|
| 35 | 95% UCL based on | 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), lognormal and normal distribution rejected, use z-statistic. | 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), lognormal and normal distribution rejected, use z-statistic. | Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic. | Large data set (n ≥ 10), use MTCAStat lognormal distribution. |
| 36 | N | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| 37 | % < Detection limit | 33% | 0% | 0% | 0% | 0% | 0% | 42% | 0% | 0% |
| 38 | Mean | 0.0061 | 10.3 | 40.2 | 34.5 | 9.9 | 1.1 | 0.69 | 15.2 | 3592 |
| 39 | Standard deviation | 0.0025 | 1.6 | 4.1 | 3.5 | 5.6 | 0.15 | 0.70 | 10.1 | 1692 |
| 40 | 95% UCL on mean | 0.0070 | 11.2 | 42.1 | 36.5 | 12.6 | 1.2 | 1.0 | 20.0 | 4702 |
| 41 | Maximum value | 0.0088 | 12.9 | 45.9 | 39.9 | 27.0 | 1.4 | 2.4 | 40.4 | 7800 |
| 42 | **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)** | 0.33 GW & River Protection | 19.1 GW Protection | 85.1 GW Protection | 67.8 River Protection | 25,000 GW Protection | 96 GW Protection | 1,000 GW Protection | 25,000 GW Protection | 200,000 ug/kg GW & River Protection |
| 43 | **WAC 173-340 3-PART TEST** | | | | | | | | | |
| 44 | 95% UCL > Cleanup Limit? | NA | NA | NA | NA | NA | NA | NA | NA | NO |
| 45 | > 10% above Cleanup Limit? | NA | NA | NA | NA | NA | NA | NA | NA | NO |
| 46 | Any sample > 2X Cleanup Limit? | NA | NA | NA | NA | NA | NA | NA | NA | NO |
| 47 | **WAC 173-340 Compliance?** | Because all values are below background (0.33 mg/kg) the WAC 173-340 3-part test is not required. | 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. | Because all values are below background (100 mg/kg) the WAC 173-340 3-part test is not required. | Because all values are below background (2.81 mg/kg) the WAC 173-340 3-part test is not required. | Because all values are below background (11.8 mg/kg) the WAC 173-340 3-part test is not required. | Because all values are below background (237 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. |

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**CALCULATION SHEET**

***Washington Closure Hanford***

**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 27 of 43

1 **100-H-28:2 and 100-H-42 Waste Sites Statistical Calculations**
2 **Verification Data - Overburden**

| 3 | Sample | Sample | Sample | TPH - Diesel | | | Pyrene (Method 8270) | | |
|---|---|---|---|---|---|---|---|---|---|
| 4 | Area | Number | Date | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 5 | OVB-9[a] | J1V4N1 | 2/26/15 | 2400 | J | 700 | 13 | U | 13 |
| 6 | Duplicate of J1V4N1[a] | J1V4N3 | 2/26/15 | 2800 | J | 660 | 12 | U | 12 |
| 7 | OVB-1 | J1V255 | 12/10/14 | 970 | J | 720 | 24 | J | 13 |
| 8 | OVB-2 | J1V256 | 12/10/14 | 2500 | J | 700 | 13 | U | 13 |
| 9 | OVB-3 | J1V257 | 12/10/14 | 2100 | J | 720 | 72 | J | 12 |
| 10 | OVB-4 | J1V258 | 12/10/14 | 970 | J | 670 | 58 | J | 12 |
| 11 | OVB-5 | J1V259 | 12/10/14 | 1600 | J | 710 | 16 | J | 12 |
| 12 | OVB-6 | J1V260 | 12/10/14 | 1700 | J | 710 | 23 | J | 12 |
| 13 | OVB-7 | J1V261 | 12/10/14 | 1800 | J | 700 | 13 | J | 12 |
| 14 | OVB-8 | J1V262 | 12/10/14 | 1400 | J | 690 | 12 | U | 12 |
| 15 | OVB-10 | J1V264 | 12/10/14 | 1300 | J | 680 | 12 | U | 12 |
| 16 | OVB-11 | J1V265 | 12/10/14 | 1400 | J | 670 | 13 | U | 13 |
| 17 | OVB-12[a] | J1V4N2 | 2/26/15 | 5600 | | 690 | 61 | J | 12 |

18 **Statistical Computation Input Data**

| 19 | Sample | Sample | Sample | TPH - Diesel | | | Pyrene (Method 8270) | | |
|---|---|---|---|---|---|---|---|---|---|
| 20 | Area | Number | Date | ug/kg | | | ug/kg | | |
| 21 | OVB-9[a] | J1V4N1/ J1V4N3 | 2/26/15 | 2600 | | | 6.3 | | |
| 22 | OVB-1 | J1V255 | 12/10/14 | 970 | | | 24 | | |
| 23 | OVB-2 | J1V256 | 12/10/14 | 2500 | | | 6.5 | | |
| 24 | OVB-3 | J1V257 | 12/10/14 | 2100 | | | 72 | | |
| 25 | OVB-4 | J1V258 | 12/10/14 | 970 | | | 58 | | |
| 26 | OVB-5 | J1V259 | 12/10/14 | 1600 | | | 16 | | |
| 27 | OVB-6 | J1V260 | 12/10/14 | 1700 | | | 23 | | |
| 28 | OVB-7 | J1V261 | 12/10/14 | 1800 | | | 13 | | |
| 29 | OVB-8 | J1V262 | 12/10/14 | 1400 | | | 6.0 | | |
| 30 | OVB-10 | J1V264 | 12/10/14 | 1300 | | | 6.0 | | |
| 31 | OVB-11 | J1V265 | 12/10/14 | 1400 | | | 6.5 | | |
| 32 | OVB-12[a] | J1V4N2 | 2/26/15 | 5600 | | | 61 | | |

33 **Statistical Computations**

| 34 | | TPH - Diesel | | | Pyrene (Method 8270) | | |
|---|---|---|---|---|---|---|---|
| 35 | 95% UCL based on | Large data set (n ≥ 10), use MTCAStat lognormal distribution. | | | Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic. | | |
| 36 | N | 12 | | | 12 | | |
| 37 | % < Detection limit | 0% | | | 42% | | |
| 38 | Mean | 1995 | | | 25 | | |
| 39 | Standard deviation | 1251 | | | 24 | | |
| 40 | 95% UCL on mean | 2696 | | | 36 | | |
| 41 | Maximum value | 5600 | | | 72 | | |
| 42 | **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise** | 200,000 ug/kg | GW & River Protection | | 48,000 ug/kg | GW Protection | |
| 43 | **WAC 173-340 3-PART TEST** | | | | | | |
| 44 | 95% UCL > Cleanup Limit? | NO | | | NO | | |
| 45 | > 10% above Cleanup Limit? | NO | | | NO | | |
| 46 | Any sample > 2X Cleanup Limit? | NO | | | NO | | |
| 47 | **WAC 173-340 Compliance?** | 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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**MAXIMUM VALUE 3-PART TEST CALCULATION SHEET**

*Washington Closure Hanford*
**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 28 of 43

**100-H-28:2 and 100-H-42 Waste Sites Maximum Calculations**
**Verification Data - Overburden**

| Sample Area | Sample Number | Sample Date | Beryllium | | | Boron | | | Silver | | | Nitrogen in Nitrite | | | Nitrogen in Nitrate | | | 4.4-DDE | | | Acenaphthene (Method 8310) | | | Benzo(a)anthracene (Method 8270) | | | Benzo(a)anthracene (Method 8310) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| OVB-9[a] | J1V4N1 | 2/26/15 | 0.15 | B | 0.031 | 1.1 | B | 0.92 | 0.15 | U | 0.15 | 0.34 | UR | 0.34 | 1.6 | BJ | 0.32 | 1.0 | J | 0.24 | 10 | U | 10 | 21 | U | 21 | 9.4 | JX | 3.3 |
| Duplicate of J1V4N1[a] | J1V4N3 | 2/26/15 | 0.14 | B | 0.031 | 0.93 | U | 0.93 | 0.15 | U | 0.15 | 0.34 | UR | 0.34 | 1.5 | BJ | 0.32 | 0.81 | J | 0.24 | 10 | U | 10 | 19 | U | 19 | 10 | J | 3.2 |
| OVB-1 | J1V255 | 12/10/14 | 0.033 | U | 0.033 | 0.98 | U | 0.98 | 0.16 | U | 0.16 | 0.35 | UR | 0.35 | 0.33 | UR | 0.33 | 0.26 | U | 0.26 | 11 | U | 11 | 21 | J | 21 | 3.4 | U | 3.4 |
| OVB-2 | J1V256 | 12/10/14 | 0.032 | U | 0.032 | 1.1 | B | 0.96 | 0.16 | U | 0.16 | 0.35 | UR | 0.35 | 0.83 | BJ | 0.33 | 0.25 | U | 0.25 | 10 | U | 10 | 21 | U | 21 | 3.3 | U | 3.3 |
| OVB-3 | J1V257 | 12/10/14 | 0.033 | U | 0.033 | 0.98 | U | 0.98 | 0.16 | U | 0.16 | 0.34 | UR | 0.34 | 2.6 | J | 0.32 | 0.25 | U | 0.25 | 10 | U | 10 | 47 | J | 20 | 3.3 | U | 3.3 |
| OVB-4 | J1V258 | 12/10/14 | 0.030 | U | 0.030 | 0.90 | U | 0.90 | 0.15 | U | 0.15 | 0.35 | UR | 0.35 | 1.2 | BJ | 0.33 | 0.24 | U | 0.24 | 11 | U | 11 | 27 | J | 20 | 3.4 | U | 3.4 |
| OVB-5 | J1V259 | 12/10/14 | 0.044 | B | 0.032 | 1.3 | B | 0.95 | 0.16 | U | 0.16 | 0.34 | UR | 0.34 | 0.89 | BJ | 0.32 | 0.24 | U | 0.24 | 11 | U | 11 | 20 | U | 20 | 3.4 | U | 3.4 |
| OVB-6 | J1V260 | 12/10/14 | 0.033 | U | 0.033 | 1.1 | B | 0.97 | 0.16 | U | 0.16 | 0.35 | UR | 0.35 | 1.0 | BJ | 0.33 | 0.24 | U | 0.24 | 10 | U | 10 | 20 | U | 20 | 3.3 | U | 3.3 |
| OVB-7 | J1V261 | 12/10/14 | 0.030 | U | 0.030 | 1.5 | B | 0.90 | 0.15 | U | 0.15 | 0.34 | UR | 0.34 | 0.96 | BJ | 0.31 | 0.25 | U | 0.25 | 10 | U | 10 | 20 | U | 20 | 3.2 | U | 3.2 |
| OVB-8 | J1V262 | 12/10/14 | 0.030 | U | 0.030 | 0.90 | U | 0.90 | 0.15 | U | 0.15 | 0.89 | BJ | 0.34 | 1.8 | BJ | 0.32 | 0.24 | U | 0.24 | 10 | U | 10 | 20 | U | 20 | 3.3 | U | 3.3 |
| OVB-10 | J1V264 | 12/10/14 | 0.034 | U | 0.034 | 1.0 | U | 1.0 | 0.16 | U | 0.16 | 0.34 | UR | 0.34 | 1.2 | BJ | 0.32 | 0.24 | U | 0.24 | 10 | U | 10 | 20 | U | 20 | 3.2 | UN | 3.2 |
| OVB-11 | J1V265 | 12/10/14 | 0.033 | U | 0.033 | 0.97 | U | 0.97 | 0.16 | U | 0.16 | 1.5 | BJ | 0.34 | 1.3 | BJ | 0.32 | 0.25 | U | 0.25 | 11 | U | 11 | 21 | U | 21 | 3.4 | U | 3.4 |
| OVB-12[a] | J1V4N2 | 2/26/15 | 0.16 | B | 0.032 | 0.95 | U | 0.95 | 0.22 | | 0.16 | 0.33 | UR | 0.33 | 1.2 | BJ | 0.31 | 0.23 | U | 0.23 | 13 | JX | 10 | 37 | J | 21 | 37 | | 3.3 |

**3-Part Test Evaluations**

| | Beryllium | | Boron | | Silver | | Nitrogen in Nitrite | | Nitrogen in Nitrate | | 4.4-DDE | | Acenaphthene (Method 8310) | | Benzo(a)anthracene (Method 8270) | | Benzo(a)anthracene (Method 8310) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % < Detection limit | 75% | | 58% | | 92% | | 0% | | 0% | | 92% | | 92% | | 67% | | 83% | |
| Maximum value | 0.16 | | 1.5 | | 0.22 | | 1.5 | | 2.6 | | 1.0 | | 13 | | 47 | | 37 | |
| **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise** | 1.51 | GW & River Protection | 320 | GW Protection | 0.73 | River Protection | 100 | GW Protection | 1000 | GW Protection | 3.3 | River Protection | 96,000 ug/kg | GW Protection | 15 ug/kg | GW & River Protection | 15 ug/kg | GW & River Protection |
| **3-PART TEST** | | | | | | | | | | | | | | | | | | |
| Maximum > Cleanup Limit? | NA | | NO | | NO | | NO | | NA | | NO | | NO | | YES | | YES | |
| > 10% above Cleanup Limit? | NA | | NO | | NO | | NO | | NA | | NO | | NO | | YES | | NO | |
| Any sample > 2X Cleanup Limit? | NA | | NO | | NO | | NO | | NA | | NO | | NO | | YES | | YES | |
| **3-Part Test Compliance?** | Because all values are below background (5 mg/kg) the 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. | | Because all values are below background (11.8 mg/kg) the 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. | | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | |

**100-H-28:2 and 100-H-42 Waste Sites Maximum Calculations**
**Verification Data - Overburden**

| Sample Area | Sample Number | Sample Date | Benzo(a)pyrene (Method 8270) | | | Benzo(a)pyrene (Method 8310) | | | Benzo(b)fluoranthene (Method 8270) | | | Benzo(b)fluoranthene (Method 8310) | | | Benzo(k)fluoranthene (Method 8310) | | | Chrysene (Method 8270) | | | Chrysene (Method 8310) | | | Fluoranthene (Method 8270) | | | Fluoranthene (Method 8310) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| OVB-9[a] | J1V4N1 | 2/26/15 | 21 | U | 21 | 8.6 | J | 6.6 | 27 | U | 27 | 8.0 | J | 4.3 | 4.1 | U | 4.1 | 28 | U | 28 | 8.7 | J | 5.0 | 38 | U | 38 | 17 | J | 13 |
| Duplicate of J1V4N1[a] | J1V4N3 | 2/26/15 | 19 | U | 19 | 8.1 | J | 6.5 | 25 | U | 25 | 8.8 | J | 4.3 | 4.0 | U | 4.0 | 26 | U | 26 | 8.9 | J | 4.9 | 35 | U | 35 | 20 | J | 13 |
| OVB-1 | J1V255 | 12/10/14 | 21 | U | 21 | 6.8 | U | 6.8 | 28 | U | 28 | 4.5 | U | 4.5 | 4.2 | U | 4.2 | 29 | U | 29 | 5.1 | U | 5.1 | 38 | U | 38 | 14 | U | 14 |
| OVB-2 | J1V256 | 12/10/14 | 21 | U | 21 | 6.7 | U | 6.7 | 27 | U | 27 | 4.4 | U | 4.4 | 4.1 | U | 4.1 | 28 | U | 28 | 5.1 | U | 5.1 | 37 | U | 37 | 14 | U | 14 |
| OVB-3 | J1V257 | 12/10/14 | 35 | J | 20 | 6.8 | J | 6.7 | 51 | J | 26 | 4.4 | U | 4.4 | 4.1 | U | 4.1 | 49 | J | 27 | 6.8 | J | 5.1 | 77 | J | 36 | 14 | U | 14 |
| OVB-4 | J1V258 | 12/10/14 | 23 | J | 20 | 6.8 | U | 6.8 | 27 | U | 27 | 4.4 | U | 4.4 | 4.2 | U | 4.2 | 34 | J | 27 | 5.1 | U | 5.1 | 46 | J | 37 | 14 | U | 14 |
| OVB-5 | J1V259 | 12/10/14 | 20 | U | 20 | 6.9 | U | 6.9 | 27 | U | 27 | 4.5 | U | 4.5 | 4.2 | U | 4.2 | 27 | U | 27 | 5.2 | U | 5.2 | 37 | U | 37 | 14 | U | 14 |
| OVB-6 | J1V260 | 12/10/14 | 20 | U | 20 | 6.7 | U | 6.7 | 26 | U | 26 | 4.4 | U | 4.4 | 4.1 | U | 4.1 | 27 | U | 27 | 5.0 | U | 5.0 | 36 | U | 36 | 14 | U | 14 |
| OVB-7 | J1V261 | 12/10/14 | 20 | U | 20 | 6.5 | U | 6.5 | 27 | U | 27 | 4.2 | U | 4.2 | 4.0 | U | 4.0 | 27 | U | 27 | 4.9 | U | 4.9 | 37 | U | 37 | 13 | U | 13 |
| OVB-8 | J1V262 | 12/10/14 | 20 | U | 20 | 6.6 | U | 6.6 | 26 | U | 26 | 4.3 | U | 4.3 | 4.0 | U | 4.0 | 26 | U | 26 | 5.0 | U | 5.0 | 35 | U | 35 | 13 | U | 13 |
| OVB-10 | J1V264 | 12/10/14 | 20 | U | 20 | 6.5 | U | 6.5 | 27 | U | 27 | 4.2 | UN | 4.2 | 4.0 | UN | 4.0 | 27 | U | 27 | 4.9 | U | 4.9 | 37 | U | 37 | 13 | UN | 13 |
| OVB-11 | J1V265 | 12/10/14 | 21 | U | 21 | 6.8 | U | 6.8 | 27 | U | 27 | 4.4 | U | 4.4 | 4.2 | U | 4.2 | 28 | U | 28 | 5.1 | U | 5.1 | 38 | U | 38 | 14 | U | 14 |
| OVB-12[a] | J1V4N2 | 2/26/15 | 30 | J | 21 | 33 | | 6.5 | 41 | JX | 27 | 32 | X | 4.3 | 13 | J | 4.0 | 34 | J | 28 | 37 | J | 4.9 | 69 | J | 37 | 58 | | 13 |

**3-Part Test Evaluations**

| | Benzo(a)pyrene (Method 8270) | | Benzo(a)pyrene (Method 8310) | | Benzo(b)fluoranthene (Method 8270) | | Benzo(b)fluoranthene (Method 8310) | | Benzo(k)fluoranthene (Method 8310) | | Chrysene (Method 8270) | | Chrysene (Method 8310) | | Fluoranthene (Method 8270) | | Fluoranthene (Method 8310) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % < Detection limit | 75% | | 75% | | 83% | | 83% | | 92% | | 75% | | 75% | | 75% | | 83% | |
| Maximum value | 35 | | 33 | | 51 | | 32 | | 13 | | 49 | | 37 | | 77 | | 58 | |
| **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise** | 15 ug/kg | GW & River Protection | 15 ug/kg | GW & River Protection | 15 ug/kg | GW & River Protection | 15 ug/kg | GW & River Protection | 15 ug/kg | GW & River Protection | 100 ug/kg | River Protection | 100 ug/kg | River Protection | 18,000 ug/kg | River Protection | 18,000 ug/kg | River Protection |
| **3-PART TEST** | | | | | | | | | | | | | | | | | | |
| Maximum > Cleanup Limit? | YES | | YES | | YES | | YES | | NO | | NO | | NO | | NO | | NO | |
| > 10% above Cleanup Limit? | YES | | NO | | YES | | NO | | NO | | NO | | NO | | NO | | NO | |
| Any sample > 2X Cleanup Limit? | YES | | YES | | YES | | YES | | NO | | NO | | NO | | NO | | NO | |
| **3-Part Test Compliance?** | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure RAG. | | A detailed assessment will be performed. The data set meets the 3-part test criteria when compared to the direct exposure 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. | | 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. | |

**MAXIMUM VALUE 3-PART TEST CALCULATION SHEET**

***Washington Closure Hanford***

**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 29 of 43

1 **100-H-28:2 and 100-H-42 Waste Sites Maximum Calculations**
2 **Verification Data - Overburden**

| 3 | Sample Area | Sample Number | Sample Date | Indeno(1,2,3-cd) pyrene (Method 8310) | | | Phenanthrene (Method 8270) | | | Phenanthrene (Method 8310) | | | Pyrene (Method 8310) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | | | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 5 | OVB-9[a] | J1V4N1 | 2/26/15 | 12 | U | 12 | 18 | U | 18 | 13 | J | 12 | 12 | U | 12 |
| 6 | Duplicate of J1V4N1[a] | J1V4N3 | 2/26/15 | 12 | U | 12 | 16 | U | 16 | 12 | U | 12 | 19 | J | 12 |
| 7 | OVB-1 | J1V255 | 12/10/14 | 13 | U | 13 | 18 | U | 18 | 13 | U | 13 | 13 | U | 13 |
| 8 | OVB-2 | J1V256 | 12/10/14 | 13 | U | 13 | 18 | U | 18 | 13 | U | 13 | 13 | U | 13 |
| 9 | OVB-3 | J1V257 | 12/10/14 | 13 | U | 13 | 31 | J | 17 | 13 | U | 13 | 18 | J | 13 |
| 10 | OVB-4 | J1V258 | 12/10/14 | 13 | U | 13 | 31 | J | 17 | 13 | U | 13 | 13 | U | 13 |
| 11 | OVB-5 | J1V259 | 12/10/14 | 13 | U | 13 | 18 | J | 17 | 13 | U | 13 | 13 | U | 13 |
| 12 | OVB-6 | J1V260 | 12/10/14 | 12 | U | 12 | 17 | U | 17 | 12 | U | 12 | 12 | U | 12 |
| 13 | OVB-7 | J1V261 | 12/10/14 | 12 | U | 12 | 17 | U | 17 | 12 | U | 12 | 12 | U | 12 |
| 14 | OVB-8 | J1V262 | 12/10/14 | 12 | U | 12 | 17 | U | 17 | 12 | U | 12 | 12 | U | 12 |
| 15 | OVB-10 | J1V264 | 12/10/14 | 12 | U | 12 | 17 | U | 17 | 12 | U | 12 | 12 | U | 12 |
| 16 | OVB-11 | J1V265 | 12/10/14 | 13 | U | 13 | 18 | U | 18 | 13 | U | 13 | 13 | U | 13 |
| 17 | OVB-12[a] | J1V4N2 | 2/26/15 | 28 | J | 12 | 46 | J | 17 | 43 | | 12 | 68 | | 12 |

18 **3-Part Test Evaluations**

| 19 | | Indeno(1,2,3-cd) pyrene (Method 8310) | Phenanthrene (Method 8270) | Phenanthrene (Method 8310) | Pyrene (Method 8310) |
|---|---|---|---|---|---|
| 20 | % < Detection limit | 92% | 67% | 83% | 75% |
| 21 | Maximum value | 28 | 46 | 43 | 68 |
| 22 | **Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg) unless stated otherwise** | 330 ug/kg GW & River Protection | 240,000 ug/kg GW Protection | 240,000 ug/kg GW Protection | 48,000 ug/kg GW Protection |
| 23 | **3-PART TEST** | | | | |
| 24 | Maximum > Cleanup Limit? | NO | NO | NO | NO |
| 25 | > 10% above Cleanup Limit? | NO | NO | NO | NO |
| 26 | Any sample > 2X Cleanup Limit? | NO | NO | NO | NO |
| 27 | **3-Part Test Compliance?** | 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** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 30 of 43

**Ecology Software (MTCAStat) Results, 100-H-28:2 and 100-H-42 Waste Sites Excavation 1**

### Arsenic 95% UCL Calculation

| DATA | ID |
|---|---|
| 5.1 | J1V272/ J1V285 |
| 5.3 | J1V543 |
| 5.4 | J1V270 |
| 2.0 | J1V271 |
| 1.9 | J1V273 |
| 2.9 | J1V274 |
| 2.1 | J1V275 |
| 5.1 | J1V276 |
| 2.7 | J1V277 |
| 9.4 | J1V278 |
| 2.0 | J1V279 |
| 9.0 | J1V280 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 12 | Mean | 4.4 |
| Censored | | Lognormal mean | 4.5 |
| Detection limit or PQL | | Std. devn. | 2.6 |
| Method detection limit | | Median | 4.0 |
| TOTAL | 12 | Min. | 1.9 |
| | | Max. | 9.4 |

Lognormal distribution? r-squared is: 0.903
Normal distribution? r-squared is: 0.850
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.7

### Barium 95% UCL Calculation

| DATA | ID |
|---|---|
| 69.4 | J1V272/ J1V285 |
| 160 | J1V543 |
| 60.4 | J1V270 |
| 23.7 | J1V271 |
| 35.5 | J1V273 |
| 33.4 | J1V274 |
| 37.7 | J1V275 |
| 81.4 | J1V276 |
| 31.9 | J1V277 |
| 54.0 | J1V278 |
| 36.1 | J1V279 |
| 59.2 | J1V280 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 12 | Mean | 56.9 |
| Censored | | Lognormal mean | 56.6 |
| Detection limit or PQL | | Std. devn. | 36.9 |
| Method detection limit | | Median | 45.9 |
| TOTAL | 12 | Min. | 23.7 |
| | | Max. | 160 |

Lognormal distribution? r-squared is: 0.923
Normal distribution? r-squared is: 0.732
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 79.7

### Cadmium 95% UCL Calculation

| DATA | ID |
|---|---|
| 0.13 | J1V272/ J1V285 |
| 0.075 | J1V543 |
| 0.072 | J1V270 |
| 0.021 | J1V271 |
| 0.060 | J1V273 |
| 0.085 | J1V274 |
| 0.064 | J1V275 |
| 0.20 | J1V276 |
| 0.052 | J1V277 |
| 0.059 | J1V278 |
| 0.085 | J1V279 |
| 0.046 | J1V280 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 12 | Mean | 0.079 |
| Censored | | Lognormal mean | 0.080 |
| Detection limit or PQL | | Std. devn. | 0.046 |
| Method detection limit | | Median | 0.068 |
| TOTAL | 12 | Min. | 0.021 |
| | | Max. | 0.20 |

Lognormal distribution? r-squared is: 0.917
Normal distribution? r-squared is: 0.799
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.12

### Chromium 95% UCL Calculation

| DATA | ID |
|---|---|
| 16.0 | J1V272/ J1V285 |
| 10.2 | J1V543 |
| 9.0 | J1V270 |
| 6.4 | J1V271 |
| 8.1 | J1V273 |
| 11.9 | J1V274 |
| 7.5 | J1V275 |
| 21.0 | J1V276 |
| 7.0 | J1V277 |
| 10.1 | J1V278 |
| 7.2 | J1V279 |
| 11.5 | J1V280 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 12 | Mean | 10.5 |
| Censored | | Lognormal mean | 10.5 |
| Detection limit or PQL | | Std. devn. | 4.3 |
| Method detection limit | | Median | 9.6 |
| TOTAL | 12 | Min. | 6.4 |
| | | Max. | 21.0 |

Lognormal distribution? r-squared is: 0.930
Normal distribution? r-squared is: 0.829
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 13.0

### Cobalt 95% UCL Calculation

| DATA | ID |
|---|---|
| 5.8 | J1V272/ J1V285 |
| 5.7 | J1V543 |
| 5.6 | J1V270 |
| 3.8 | J1V271 |
| 4.9 | J1V273 |
| 5.9 | J1V274 |
| 4.4 | J1V275 |
| 6.5 | J1V276 |
| 4.0 | J1V277 |
| 5.3 | J1V278 |
| 5.1 | J1V279 |
| 5.9 | J1V280 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 12 | Mean | 5.2 |
| Censored | | Lognormal mean | 5.2 |
| Detection limit or PQL | | Std. devn. | 0.83 |
| Method detection limit | | Median | 5.5 |
| TOTAL | 12 | Min. | 3.8 |
| | | Max. | 6.5 |

Lognormal distribution? r-squared is: 0.926
Normal distribution? r-squared is: 0.949
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 5.7

### Copper 95% UCL Calculation

| DATA | ID |
|---|---|
| 12.3 | J1V272/ J1V285 |
| 16.4 | J1V543 |
| 11.8 | J1V270 |
| 9.6 | J1V271 |
| 11.1 | J1V273 |
| 10.9 | J1V274 |
| 9.3 | J1V275 |
| 21.2 | J1V276 |
| 9.6 | J1V277 |
| 11.0 | J1V278 |
| 10.1 | J1V279 |
| 20.9 | J1V280 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 12 | Mean | 12.9 |
| Censored | | Lognormal mean | 12.9 |
| Detection limit or PQL | | Std. devn. | 4.3 |
| Method detection limit | | Median | 11.1 |
| TOTAL | 12 | Min. | 9.3 |
| | | Max. | 21.2 |

Lognormal distribution? r-squared is: 0.827
Normal distribution? r-squared is: 0.766
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 14.9

### Lead 95% UCL Calculation

| DATA | ID |
|---|---|
| 7.3 | J1V272/ J1V285 |
| 11.7 | J1V543 |
| 15.6 | J1V270 |
| 1.7 | J1V271 |
| 2.3 | J1V273 |
| 2.7 | J1V274 |
| 4.3 | J1V275 |
| 12.5 | J1V276 |
| 5.4 | J1V277 |
| 30.2 | J1V278 |
| 4.7 | J1V279 |
| 4.1 | J1V280 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 12 | Mean | 8.5 |
| Censored | | Lognormal mean | 8.7 |
| Detection limit or PQL | | Std. devn. | 8.1 |
| Method detection limit | | Median | 5.1 |
| TOTAL | 12 | Min. | 1.7 |
| | | Max. | 30.2 |

Lognormal distribution? r-squared is: 0.976
Normal distribution? r-squared is: 0.766
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 17.3

### Manganese 95% UCL Calculation

| DATA | ID |
|---|---|
| 222 | J1V272/ J1V285 |
| 264 | J1V543 |
| 217 | J1V270 |
| 160 | J1V271 |
| 199 | J1V273 |
| 195 | J1V274 |
| 173 | J1V275 |
| 271 | J1V276 |
| 167 | J1V277 |
| 218 | J1V278 |
| 189 | J1V279 |
| 253 | J1V280 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 12 | Mean | 211 |
| Censored | | Lognormal mean | 211 |
| Detection limit or PQL | | Std. devn. | 37.2 |
| Method detection limit | | Median | 208 |
| TOTAL | 12 | Min. | 160 |
| | | Max. | 271 |

Lognormal distribution? r-squared is: 0.969
Normal distribution? r-squared is: 0.957
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 232

### Mercury 95% UCL Calculation

| DATA | ID |
|---|---|
| 0.035 | J1V272/ J1V285 |
| 0.0092 | J1V543 |
| 0.063 | J1V270 |
| 0.0028 | J1V271 |
| 0.0028 | J1V273 |
| 0.0028 | J1V274 |
| 0.0028 | J1V275 |
| 0.43 | J1V276 |
| 0.0025 | J1V277 |
| 0.12 | J1V278 |
| 0.013 | J1V279 |
| 0.0077 | J1V280 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 12 | Mean | 0.058 |
| Censored | | Lognormal mean | 0.057 |
| Detection limit or PQL | | Std. devn. | 0.12 |
| Method detection limit | | Median | 0.0085 |
| TOTAL | 12 | Min. | 0.0025 |
| | | Max. | 0.43 |

Lognormal distribution? r-squared is: 0.874
Normal distribution? r-squared is: 0.495
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.12

**CALCULATION SHEET**

***Washington Closure Hanford***

**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 31 of 43

**Ecology Software (MTCAStat) Results, 100-H-28:2 and 100-H-42 Waste Sites Excavation 1**

### Nickel 95% UCL Calculation

| DATA | ID |
|---|---|
| 14.8 | J1V272/ J1V285 |
| 12.8 | J1V543 |
| 9.2 | J1V270 |
| 7.4 | J1V271 |
| 7.3 | J1V273 |
| 22.2 | J1V274 |
| 6.8 | J1V275 |
| 17.2 | J1V276 |
| 8.6 | J1V277 |
| 9.9 | J1V278 |
| 8.2 | J1V279 |
| 10.9 | J1V280 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 11.3 |
| Censored | | Lognormal mean | 11.3 |
| Detection limit or PQL | | Std. devn. | 4.7 |
| Method detection limit | | Median | 9.6 |
| TOTAL | 12 | Min. | 6.8 |
| | | Max. | 22.2 |

Lognormal distribution? r-squared is: 0.936
Normal distribution? r-squared is: 0.856
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 14.1

### Vanadium 95% UCL Calculation

| DATA | ID |
|---|---|
| 31.1 | J1V272/ J1V285 |
| 43.5 | J1V543 |
| 39.0 | J1V270 |
| 25.4 | J1V271 |
| 34.0 | J1V273 |
| 34.3 | J1V274 |
| 30.3 | J1V275 |
| 33.8 | J1V276 |
| 28.6 | J1V277 |
| 30.6 | J1V278 |
| 37.1 | J1V279 |
| 35.9 | J1V280 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 33.6 |
| Censored | | Lognormal mean | 33.7 |
| Detection limit or PQL | | Std. devn. | 4.9 |
| Method detection limit | | Median | 33.9 |
| TOTAL | 12 | Min. | 25.4 |
| | | Max. | 43.5 |

Lognormal distribution? r-squared is: 0.983
Normal distribution? r-squared is: 0.976
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 36.4

### Zinc 95% UCL Calculation

| DATA | ID |
|---|---|
| 41.9 | J1V272/ J1V285 |
| 34.7 | J1V543 |
| 31.9 | J1V270 |
| 20.6 | J1V271 |
| 27.2 | J1V273 |
| 26.0 | J1V274 |
| 22.4 | J1V275 |
| 48.7 | J1V276 |
| 20.4 | J1V277 |
| 30.7 | J1V278 |
| 25.6 | J1V279 |
| 44.2 | J1V280 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 31.2 |
| Censored | | Lognormal mean | 31.3 |
| Detection limit or PQL | | Std. devn. | 9.5 |
| Method detection limit | | Median | 29.0 |
| TOTAL | 12 | Min. | 20.4 |
| | | Max. | 48.7 |

Lognormal distribution? r-squared is: 0.962
Normal distribution? r-squared is: 0.931
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 37.1

### Fluoride 95% UCL Calculation

| DATA | ID |
|---|---|
| 1.6 | J1V272/ J1V285 |
| 1.3 | J1V543 |
| 1.2 | J1V270 |
| 0.42 | J1V271 |
| 0.41 | J1V273 |
| 0.84 | J1V274 |
| 0.41 | J1V275 |
| 1.4 | J1V276 |
| 0.87 | J1V277 |
| 1.0 | J1V278 |
| 0.42 | J1V279 |
| 0.42 | J1V280 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 0.85 |
| Censored | | Lognormal mean | 0.86 |
| Detection limit or PQL | | Std. devn. | 0.44 |
| Method detection limit | | Median | 0.86 |
| TOTAL | 12 | Min. | 0.41 |
| | | Max. | 1.6 |

Lognormal distribution? r-squared is: 0.855
Normal distribution? r-squared is: 0.883
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 1.1

### Nitrogen in nitrate 95% UCL Calculation

| DATA | ID |
|---|---|
| 1.0 | J1V272/ J1V285 |
| 3.1 | J1V543 |
| 0.83 | J1V270 |
| 0.16 | J1V271 |
| 0.16 | J1V273 |
| 0.71 | J1V274 |
| 0.76 | J1V275 |
| 1.2 | J1V276 |
| 0.16 | J1V277 |
| 0.17 | J1V278 |
| 0.70 | J1V279 |
| 1.1 | J1V280 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 0.84 |
| Censored | | Lognormal mean | 0.91 |
| Detection limit or PQL | | Std. devn. | 0.81 |
| Method detection limit | | Median | 0.74 |
| TOTAL | 12 | Min. | 0.16 |
| | | Max. | 3.1 |

Lognormal distribution? r-squared is: 0.873
Normal distribution? r-squared is: 0.729
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 1.2

### Sulfate 95% UCL Calculation

| DATA | ID |
|---|---|
| 13.5 | J1V272/ J1V285 |
| 13.4 | J1V543 |
| 17.2 | J1V270 |
| 8.2 | J1V271 |
| 7.9 | J1V273 |
| 8.9 | J1V274 |
| 7.8 | J1V275 |
| 17.9 | J1V276 |
| 18.9 | J1V277 |
| 14.8 | J1V278 |
| 10.1 | J1V279 |
| 58.7 | J1V280 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 16.4 |
| Censored | | Lognormal mean | 16.0 |
| Detection limit or PQL | | Std. devn. | 13.9 |
| Method detection limit | | Median | 13.5 |
| TOTAL | 12 | Min. | 7.8 |
| | | Max. | 58.7 |

Lognormal distribution? r-squared is: 0.829
Normal distribution? r-squared is: 0.566
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 23

### TPH - Diesel EXT 95% UCL Calculation

| DATA | ID |
|---|---|
| 3150 | J1V272/ J1V285 |
| 7400 | J1V543 |
| 78000 | J1V270 |
| 1200 | J1V271 |
| 3000 | J1V273 |
| 2500 | J1V274 |
| 1500 | J1V275 |
| 7300 | J1V276 |
| 8300 | J1V277 |
| 6300 | J1V278 |
| 2300 | J1V279 |
| 7700 | J1V280 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 10721 |
| Censored | | Lognormal mean | 8892 |
| Detection limit or PQL | | Std. devn. | 21352 |
| Method detection limit | | Median | 4725 |
| TOTAL | 12 | Min. | 1200 |
| | | Max. | 78000 |

Lognormal distribution? r-squared is: 0.854
Normal distribution? r-squared is: 0.406
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 20860

### TPH - Diesel 95% UCL Calculation

| DATA | ID |
|---|---|
| 1550 | J1V272/ J1V285 |
| 4600 | J1V543 |
| 33000 | J1V270 |
| 690 | J1V271 |
| 2200 | J1V273 |
| 1500 | J1V274 |
| 800 | J1V275 |
| 3400 | J1V276 |
| 3000 | J1V277 |
| 2500 | J1V278 |
| 1600 | J1V279 |
| 4000 | J1V280 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 4903 |
| Censored | | Lognormal mean | 4184 |
| Detection limit or PQL | | Std. devn. | 8932 |
| Method detection limit | | Median | 2350 |
| TOTAL | 12 | Min. | 690 |
| | | Max. | 33000 |

Lognormal distribution? r-squared is: 0.860
Normal distribution? r-squared is: 0.422
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 9145

**CALCULATION SHEET**

***Washington Closure Hanford***

**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 32 of 43

**Ecology Software (MTCAStat) Results, 100-H-28:2 and 100-H-42 Waste Sites Excavation 2**

### Arsenic 95% UCL Calculation

| DATA | ID |
|---|---|
| 3.7 | J1V292/ J1V289 |
| 1.9 | J1V286 |
| 2.5 | J1V287 |
| 4.2 | J1V288 |
| 1.7 | J1V289 |
| 2.7 | J1V290 |
| 3.1 | J1V291 |
| 2.3 | J1V293 |
| 6.5 | J1V294 |
| 1.2 | J1V295 |
| 2.1 | J1V296 |
| 4.3 | J1V297 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 3.0 |
| Censored | | Lognormal mean | 3.0 |
| Detection limit or PQL | | Std. devn. | 1.5 |
| Method detection limit | | Median | 2.6 |
| TOTAL | 12 | Min. | 1.2 |
| | | Max. | 6.5 |

Lognormal distribution? r-squared is: 0.988
Normal distribution? r-squared is: 0.902
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 4.1

### Barium 95% UCL Calculation

| DATA | ID |
|---|---|
| 55.9 | J1V292/ J1V289 |
| 38.1 | J1V286 |
| 65.1 | J1V287 |
| 43.2 | J1V288 |
| 51.5 | J1V289 |
| 46.0 | J1V290 |
| 67.0 | J1V291 |
| 47.8 | J1V293 |
| 43.3 | J1V294 |
| 54.2 | J1V295 |
| 54.2 | J1V296 |
| 41.9 | J1V297 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 50.7 |
| Censored | | Lognormal mean | 50.7 |
| Detection limit or PQL | | Std. devn. | 9.1 |
| Method detection limit | | Median | 49.7 |
| TOTAL | 12 | Min. | 38.1 |
| | | Max. | 67.0 |

Lognormal distribution? r-squared is: 0.968
Normal distribution? r-squared is: 0.948
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 55.9

### Cadmium 95% UCL Calculation

| DATA | ID |
|---|---|
| 0.10 | J1V292/ J1V289 |
| 0.11 | J1V286 |
| 0.081 | J1V287 |
| 0.069 | J1V288 |
| 0.11 | J1V289 |
| 0.05 | J1V290 |
| 0.10 | J1V291 |
| 0.073 | J1V293 |
| 0.067 | J1V294 |
| 0.084 | J1V295 |
| 0.080 | J1V296 |
| 0.064 | J1V297 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 0.083 |
| Censored | | Lognormal mean | 0.083 |
| Detection limit or PQL | | Std. devn. | 0.019 |
| Method detection limit | | Median | 0.081 |
| TOTAL | 12 | Min. | 0.052 |
| | | Max. | 0.11 |

Lognormal distribution? r-squared is: 0.958
Normal distribution? r-squared is: 0.951
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.095

### Chromium 95% UCL Calculation

| DATA | ID |
|---|---|
| 8.6 | J1V292/ J1V289 |
| 9.3 | J1V286 |
| 7.0 | J1V287 |
| 8.7 | J1V288 |
| 6.6 | J1V289 |
| 13.2 | J1V290 |
| 12.3 | J1V291 |
| 9.7 | J1V293 |
| 8.5 | J1V294 |
| 4.4 | J1V295 |
| 5.3 | J1V296 |
| 7.8 | J1V297 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 8.4 |
| Censored | | Lognormal mean | 8.5 |
| Detection limit or PQL | | Std. devn. | 2.6 |
| Method detection limit | | Median | 8.5 |
| TOTAL | 12 | Min. | 4.4 |
| | | Max. | 13.2 |

Lognormal distribution? r-squared is: 0.965
Normal distribution? r-squared is: 0.962
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 10.2

### Cobalt 95% UCL Calculation

| DATA | ID |
|---|---|
| 6.3 | J1V292/ J1V289 |
| 5.5 | J1V286 |
| 6.7 | J1V287 |
| 5.7 | J1V288 |
| 6.8 | J1V289 |
| 6.6 | J1V290 |
| 7.6 | J1V291 |
| 6.2 | J1V293 |
| 5.7 | J1V294 |
| 7.0 | J1V295 |
| 6.9 | J1V296 |
| 5.2 | J1V297 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 6.3 |
| Censored | | Lognormal mean | 6.3 |
| Detection limit or PQL | | Std. devn. | 0.71 |
| Method detection limit | | Median | 6.4 |
| TOTAL | 12 | Min. | 5.2 |
| | | Max. | 7.6 |

Lognormal distribution? r-squared is: 0.968
Normal distribution? r-squared is: 0.971
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.7

### Copper 95% UCL Calculation

| DATA | ID |
|---|---|
| 13.6 | J1V292/ J1V289 |
| 12.2 | J1V286 |
| 17.4 | J1V287 |
| 10.8 | J1V288 |
| 13.6 | J1V289 |
| 20.1 | J1V290 |
| 16.1 | J1V291 |
| 12.8 | J1V293 |
| 11.9 | J1V294 |
| 12.4 | J1V295 |
| 13.4 | J1V296 |
| 11.1 | J1V297 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 13.8 |
| Censored | | Lognormal mean | 13.8 |
| Detection limit or PQL | | Std. devn. | 2.8 |
| Method detection limit | | Median | 13.1 |
| TOTAL | 12 | Min. | 10.8 |
| | | Max. | 20.1 |

Lognormal distribution? r-squared is: 0.914
Normal distribution? r-squared is: 0.866
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 15.3

### Lead 95% UCL Calculation

| DATA | ID |
|---|---|
| 9.6 | J1V292/ J1V289 |
| 2.6 | J1V286 |
| 2.2 | J1V287 |
| 10.2 | J1V288 |
| 2.2 | J1V289 |
| 2.9 | J1V290 |
| 8.2 | J1V291 |
| 3.9 | J1V293 |
| 18.0 | J1V294 |
| 2.0 | J1V295 |
| 3.2 | J1V296 |
| 12.3 | J1V297 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 6.4 |
| Censored | | Lognormal mean | 6.6 |
| Detection limit or PQL | | Std. devn. | 5.2 |
| Method detection limit | | Median | 3.6 |
| TOTAL | 12 | Min. | 2.0 |
| | | Max. | 18.0 |

Lognormal distribution? r-squared is: 0.901
Normal distribution? r-squared is: 0.832
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 12.0

### Manganese 95% UCL Calculation

| DATA | ID |
|---|---|
| 253 | J1V292/ J1V289 |
| 212 | J1V286 |
| 286 | J1V287 |
| 219 | J1V288 |
| 217 | J1V289 |
| 312 | J1V290 |
| 264 | J1V291 |
| 241 | J1V293 |
| 223 | J1V294 |
| 211 | J1V295 |
| 228 | J1V296 |
| 192 | J1V297 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 238 |
| Censored | | Lognormal mean | 238 |
| Detection limit or PQL | | Std. devn. | 34.8 |
| Method detection limit | | Median | 226 |
| TOTAL | 12 | Min. | 192 |
| | | Max. | 312 |

Lognormal distribution? r-squared is: 0.945
Normal distribution? r-squared is: 0.917
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 257

### Nickel 95% UCL Calculation

| DATA | ID |
|---|---|
| 10.2 | J1V292/ J1V289 |
| 9.7 | J1V286 |
| 7.6 | J1V287 |
| 8.8 | J1V288 |
| 6.5 | J1V289 |
| 11.0 | J1V290 |
| 13.6 | J1V291 |
| 10.1 | J1V293 |
| 10.2 | J1V294 |
| 6.0 | J1V295 |
| 8.1 | J1V296 |
| 7.3 | J1V297 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 9.1 |
| Censored | | Lognormal mean | 9.1 |
| Detection limit or PQL | | Std. devn. | 2.1 |
| Method detection limit | | Median | 9.3 |
| TOTAL | 12 | Min. | 6.0 |
| | | Max. | 13.6 |

Lognormal distribution? r-squared is: 0.973
Normal distribution? r-squared is: 0.955
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 10.4

**CALCULATION SHEET**

***Washington Closure Hanford***

**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 33 of 43

**Ecology Software (MTCAStat) Results, 100-H-28:2 and 100-H-42 Waste Sites Excavation 2**

**Vanadium 95% UCL Calculation**

| DATA | ID |
|---|---|
| 41.6 | J1V292/ J1V289 |
| 40.1 | J1V286 |
| 33.3 | J1V287 |
| 34.2 | J1V288 |
| 59.2 | J1V289 |
| 41.8 | J1V290 |
| 48.6 | J1V291 |
| 40.2 | J1V293 |
| 36.6 | J1V294 |
| 49.7 | J1V295 |
| 50.2 | J1V296 |
| 32.8 | J1V297 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 42.4 |
| Censored | | Lognormal mean | 42.4 |
| Detection limit or PQL | | Std. devn. | 8.1 |
| Method detection limit | | Median | 40.9 |
| TOTAL | 12 | Min. | 32.8 |
| | | Max. | 59.2 |

Lognormal distribution? r-squared is: 0.952
Normal distribution? r-squared is: 0.929
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 47.0

**Zinc 95% UCL Calculation**

| DATA | ID |
|---|---|
| 33.9 | J1V292/ J1V289 |
| 28.5 | J1V286 |
| 29.8 | J1V287 |
| 30.6 | J1V288 |
| 34.4 | J1V289 |
| 32.3 | J1V290 |
| 38.8 | J1V291 |
| 31.5 | J1V293 |
| 32.0 | J1V294 |
| 32.5 | J1V295 |
| 31.1 | J1V296 |
| 29.7 | J1V297 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 32.1 |
| Censored | | Lognormal mean | 32.1 |
| Detection limit or PQL | | Std. devn. | 2.71 |
| Method detection limit | | Median | 31.8 |
| TOTAL | 12 | Min. | 28.50 |
| | | Max. | 38.8 |

Lognormal distribution? r-squared is: 0.921
Normal distribution? r-squared is: 0.893
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 33.5

**Fluoride 95% UCL Calculation**

| DATA | ID |
|---|---|
| 1.1 | J1V292/ J1V289 |
| 0.40 | J1V286 |
| 0.40 | J1V287 |
| 1.1 | J1V288 |
| 0.39 | J1V289 |
| 0.41 | J1V290 |
| 0.92 | J1V291 |
| 0.87 | J1V293 |
| 1.10 | J1V294 |
| 0.40 | J1V295 |
| 0.41 | J1V296 |
| 1.0 | J1V297 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 0.70 |
| Censored | | Lognormal mean | 0.71 |
| Detection limit or PQL | | Std. devn. | 0.32 |
| Method detection limit | | Median | 0.64 |
| TOTAL | 12 | Min. | 0.39 |
| | | Max. | 1.1 |

Lognormal distribution? r-squared is: 0.768
Normal distribution? r-squared is: 0.788
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.86

**Sulfate 95% UCL Calculation**

| DATA | ID |
|---|---|
| 9.1 | J1V292/ J1V289 |
| 6.9 | J1V286 |
| 6.3 | J1V287 |
| 23.9 | J1V288 |
| 6.6 | J1V289 |
| 7.2 | J1V290 |
| 11.3 | J1V291 |
| 8.6 | J1V293 |
| 10.2 | J1V294 |
| 6.9 | J1V295 |
| 7.8 | J1V296 |
| 9.2 | J1V297 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 9.5 |
| Censored | | Lognormal mean | 9.4 |
| Detection limit or PQL | | Std. devn. | 4.8 |
| Method detection limit | | Median | 8.2 |
| TOTAL | 12 | Min. | 6.3 |
| | | Max. | 23.9 |

Lognormal distribution? r-squared is: 0.771
Normal distribution? r-squared is: 0.596
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 11.8

**CALCULATION SHEET**

***Washington Closure Hanford***
**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 34 of 43

**Ecology Software (MTCAStat) Results, 100-H-28:2 and 100-H-42 Waste Sites Staging Pile Area**

### Arsenic 95% UCL Calculation

| DATA | ID |
|---|---|
| 3.9 | J1V4L5/ J1V4N0 |
| 3.6 | J1V4L6 |
| 4.1 | J1V4L7 |
| 4.0 | J1V4L8 |
| 2.1 | J1V4L9 |
| 2.8 | J1V4M0 |
| 3.5 | J1V4M1 |
| 3.4 | J1V4M2 |
| 3.3 | J1V4M3 |
| 4.4 | J1V4M4 |
| 1.7 | J1V4M5 |
| 16.6 | J1V4M6 |
| 56.0 | J1V4M7 |
| 6.1 | J1V4M8 |
| 21.9 | J1V4M9 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 15 | Mean | 9.2 |
| Censored | | Lognormal mean | 8.1 |
| Detection limit or PQL | | Std. devn. | 14.1 |
| Method detection limit | | Median | 3.9 |
| TOTAL | 15 | Min. | 1.7 |
| | | Max. | 56.0 |

Lognormal distribution? r-squared is: 0.805
Normal distribution? r-squared is: 0.509
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 15.2

### Barium 95% UCL Calculation

| DATA | ID |
|---|---|
| 61.7 | J1V4L5/ J1V4N0 |
| 68.0 | J1V4L6 |
| 51.4 | J1V4L7 |
| 50.8 | J1V4L8 |
| 40.0 | J1V4L9 |
| 40.6 | J1V4M0 |
| 145 | J1V4M1 |
| 80.9 | J1V4M2 |
| 57.6 | J1V4M3 |
| 47.0 | J1V4M4 |
| 40.5 | J1V4M5 |
| 62.8 | J1V4M6 |
| 91.1 | J1V4M7 |
| 54.6 | J1V4M8 |
| 85.9 | J1V4M9 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 15 | Mean | 65.2 |
| Censored | | Lognormal mean | 65.1 |
| Detection limit or PQL | | Std. devn. | 27.4 |
| Method detection limit | | Median | 57.6 |
| TOTAL | 15 | Min. | 40.0 |
| | | Max. | 145 |

Lognormal distribution? r-squared is: 0.925
Normal distribution? r-squared is: 0.796
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 78.2

### Beryllium 95% UCL Calculation

| DATA | ID |
|---|---|
| 0.26 | J1V4L5/ J1V4N0 |
| 0.26 | J1V4L6 |
| 0.24 | J1V4L7 |
| 0.23 | J1V4L8 |
| 0.21 | J1V4L9 |
| 0.22 | J1V4M0 |
| 0.29 | J1V4M1 |
| 0.38 | J1V4M2 |
| 0.23 | J1V4M3 |
| 0.23 | J1V4M4 |
| 0.13 | J1V4M5 |
| 0.21 | J1V4M6 |
| 0.37 | J1V4M7 |
| 0.26 | J1V4M8 |
| 0.25 | J1V4M9 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 15 | Mean | 0.25 |
| Censored | | Lognormal mean | 0.25 |
| Detection limit or PQL | | Std. devn. | 0.062 |
| Method detection limit | | Median | 0.24 |
| TOTAL | 15 | Min. | 0.13 |
| | | Max. | 0.38 |

Lognormal distribution? r-squared is: 0.868
Normal distribution? r-squared is: 0.870
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.28

### Boron 95% UCL Calculation

| DATA | ID |
|---|---|
| 0.73 | J1V4L5/ J1V4N0 |
| 1.6 | J1V4L6 |
| 0.90 | J1V4L7 |
| 1.4 | J1V4L8 |
| 1.0 | J1V4L9 |
| 1.0 | J1V4M0 |
| 12.0 | J1V4M1 |
| 1.2 | J1V4M2 |
| 0.48 | J1V4M3 |
| 1.0 | J1V4M4 |
| 0.43 | J1V4M5 |
| 1.4 | J1V4M6 |
| 2.5 | J1V4M7 |
| 1.4 | J1V4M8 |
| 2.9 | J1V4M9 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 15 | Mean | 2.0 |
| Censored | | Lognormal mean | 1.8 |
| Detection limit or PQL | | Std. devn. | 2.8 |
| Method detection limit | | Median | 1.2 |
| TOTAL | 15 | Min. | 0.43 |
| | | Max. | 12.0 |

Lognormal distribution? r-squared is: 0.864
Normal distribution? r-squared is: 0.456
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 3.2

### Cadmium 95% UCL Calculation

| DATA | ID |
|---|---|
| 0.11 | J1V4L5/ J1V4N0 |
| 0.15 | J1V4L6 |
| 0.13 | J1V4L7 |
| 0.14 | J1V4L8 |
| 0.11 | J1V4L9 |
| 0.12 | J1V4M0 |
| 0.13 | J1V4M1 |
| 0.13 | J1V4M2 |
| 0.14 | J1V4M3 |
| 0.13 | J1V4M4 |
| 0.13 | J1V4M5 |
| 0.086 | J1V4M6 |
| 0.65 | J1V4M7 |
| 0.15 | J1V4M8 |
| 0.13 | J1V4M9 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 15 | Mean | 0.16 |
| Censored | | Lognormal mean | 0.16 |
| Detection limit or PQL | | Std. devn. | 0.14 |
| Method detection limit | | Median | 0.13 |
| TOTAL | 15 | Min. | 0.086 |
| | | Max. | 0.65 |

Lognormal distribution? r-squared is: 0.533
Normal distribution? r-squared is: 0.359
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.22

### Chromium 95% UCL Calculation

| DATA | ID |
|---|---|
| 10.2 | J1V4L5/ J1V4N0 |
| 9.8 | J1V4L6 |
| 9.3 | J1V4L7 |
| 9.7 | J1V4L8 |
| 9.8 | J1V4L9 |
| 9.0 | J1V4M0 |
| 10.0 | J1V4M1 |
| 12.6 | J1V4M2 |
| 9.6 | J1V4M3 |
| 9.5 | J1V4M4 |
| 7.8 | J1V4M5 |
| 12.5 | J1V4M6 |
| 13.1 | J1V4M7 |
| 11.2 | J1V4M8 |
| 13.7 | J1V4M9 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 15 | Mean | 10.5 |
| Censored | | Lognormal mean | 10.5 |
| Detection limit or PQL | | Std. devn. | 1.7 |
| Method detection limit | | Median | 9.8 |
| TOTAL | 15 | Min. | 7.8 |
| | | Max. | 13.7 |

Lognormal distribution? r-squared is: 0.920
Normal distribution? r-squared is: 0.901
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.3

### Cobalt 95% UCL Calculation

| DATA | ID |
|---|---|
| 5.7 | J1V4L5/ J1V4N0 |
| 6.2 | J1V4L6 |
| 5.6 | J1V4L7 |
| 5.9 | J1V4L8 |
| 5.1 | J1V4L9 |
| 5.4 | J1V4M0 |
| 6.2 | J1V4M1 |
| 7.7 | J1V4M2 |
| 5.4 | J1V4M3 |
| 5.9 | J1V4M4 |
| 6.6 | J1V4M5 |
| 6.6 | J1V4M6 |
| 7.9 | J1V4M7 |
| 6.1 | J1V4M8 |
| 7.7 | J1V4M9 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 15 | Mean | 6.3 |
| Censored | | Lognormal mean | 6.3 |
| Detection limit or PQL | | Std. devn. | 0.88 |
| Method detection limit | | Median | 6.1 |
| TOTAL | 15 | Min. | 5.1 |
| | | Max. | 7.9 |

Lognormal distribution? r-squared is: 0.931
Normal distribution? r-squared is: 0.904
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.7

### Copper 95% UCL Calculation

| DATA | ID |
|---|---|
| 10.9 | J1V4L5/ J1V4N0 |
| 15.1 | J1V4L6 |
| 13.7 | J1V4L7 |
| 14.4 | J1V4L8 |
| 12.7 | J1V4L9 |
| 12.5 | J1V4M0 |
| 15.7 | J1V4M1 |
| 16.4 | J1V4M2 |
| 14.4 | J1V4M3 |
| 15.8 | J1V4M4 |
| 12.6 | J1V4M5 |
| 13.8 | J1V4M6 |
| 16.8 | J1V4M7 |
| 14.1 | J1V4M8 |
| 25.8 | J1V4M9 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 15 | Mean | 15.0 |
| Censored | | Lognormal mean | 15.0 |
| Detection limit or PQL | | Std. devn. | 3.40 |
| Method detection limit | | Median | 14.4 |
| TOTAL | 15 | Min. | 10.85 |
| | | Max. | 25.8 |

Lognormal distribution? r-squared is: 0.837
Normal distribution? r-squared is: 0.723
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 16.4

### Lead 95% UCL Calculation

| DATA | ID |
|---|---|
| 4.1 | J1V4L5/ J1V4N0 |
| 8.2 | J1V4L6 |
| 6.0 | J1V4L7 |
| 13.2 | J1V4L8 |
| 4.2 | J1V4L9 |
| 3.0 | J1V4M0 |
| 7.0 | J1V4M1 |
| 5.1 | J1V4M2 |
| 7.4 | J1V4M3 |
| 8.8 | J1V4M4 |
| 2.6 | J1V4M5 |
| 59.2 | J1V4M6 |
| 296 | J1V4M7 |
| 18.2 | J1V4M8 |
| 54.8 | J1V4M9 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 15 | Mean | 33.2 |
| Censored | | Lognormal mean | 25.3 |
| Detection limit or PQL | | Std. devn. | 74.9 |
| Method detection limit | | Median | 7.4 |
| TOTAL | 15 | Min. | 2.6 |
| | | Max. | 296 |

Lognormal distribution? r-squared is: 0.857
Normal distribution? r-squared is: 0.413
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 65.0

**CALCULATION SHEET**

*Washington Closure Hanford*

**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 35 of 43

**Ecology Software (MTCAStat) Results, 100-H-28:2 and 100-H-42 Waste Sites Staging Pile Area**

### Manganese 95% UCL Calculation

| DATA | ID |
|---|---|
| 298 | J1V4L5/ J1V4N0 |
| 257 | J1V4L6 |
| 244 | J1V4L7 |
| 259 | J1V4L8 |
| 233 | J1V4L9 |
| 242 | J1V4M0 |
| 265 | J1V4M1 |
| 332 | J1V4M2 |
| 430 | J1V4M3 |
| 262 | J1V4M4 |
| 218 | J1V4M5 |
| 256 | J1V4M6 |
| 378 | J1V4M7 |
| 273 | J1V4M8 |
| 291 | J1V4M9 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 15 | Mean | 283 |
| Censored | | Lognormal mean | 283 |
| Detection limit or PQL | | Std. devn. | 57.4 |
| Method detection limit | | Median | 262 |
| TOTAL | 15 | Min. | 218 |
| | | Max. | 430 |

Lognormal distribution? r-squared is: 0.886
Normal distribution? r-squared is: 0.826
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 307

### Mercury 95% UCL Calculation

| DATA | ID |
|---|---|
| 0.0031 | J1V4L5/ J1V4N0 |
| 0.0073 | J1V4L6 |
| 0.022 | J1V4L7 |
| 0.041 | J1V4L8 |
| 0.0099 | J1V4L9 |
| 0.0033 | J1V4M0 |
| 0.012 | J1V4M1 |
| 0.0033 | J1V4M2 |
| 0.0033 | J1V4M3 |
| 0.012 | J1V4M4 |
| 0.0032 | J1V4M5 |
| 0.043 | J1V4M6 |
| 0.0079 | J1V4M7 |
| 0.0035 | J1V4M8 |
| 0.020 | J1V4M9 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 15 | Mean | 0.013 |
| Censored | | Lognormal mean | 0.013 |
| Detection limit or PQL | | Std. devn. | 0.013 |
| Method detection limit | | Median | 0.0079 |
| TOTAL | 15 | Min. | 0.0031 |
| | | Max. | 0.043 |

Lognormal distribution? r-squared is: 0.897
Normal distribution? r-squared is: 0.756
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.019

### Nickel 95% UCL Calculation

| DATA | ID |
|---|---|
| 10.8 | J1V4L5/ J1V4N0 |
| 10.3 | J1V4L6 |
| 9.4 | J1V4L7 |
| 10.4 | J1V4L8 |
| 10.3 | J1V4L9 |
| 10.7 | J1V4M0 |
| 10.8 | J1V4M1 |
| 13.7 | J1V4M2 |
| 12.1 | J1V4M3 |
| 11.1 | J1V4M4 |
| 7.2 | J1V4M5 |
| 11.0 | J1V4M6 |
| 13.6 | J1V4M7 |
| 11.8 | J1V4M8 |
| 14.1 | J1V4M9 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 15 | Mean | 11.2 |
| Censored | | Lognormal mean | 11.2 |
| Detection limit or PQL | | Std. devn. | 1.8 |
| Method detection limit | | Median | 10.8 |
| TOTAL | 15 | Min. | 7.2 |
| | | Max. | 14.1 |

Lognormal distribution? r-squared is: 0.891
Normal distribution? r-squared is: 0.920
Recommendations:
Use normal distribution.

UCL (based on t-statistic) is 12.0

### Vanadium 95% UCL Calculation

| DATA | ID |
|---|---|
| 36.7 | J1V4L5/ J1V4N0 |
| 47.4 | J1V4L6 |
| 39.9 | J1V4L7 |
| 41.2 | J1V4L8 |
| 39.2 | J1V4L9 |
| 41.5 | J1V4M0 |
| 44.8 | J1V4M1 |
| 43.5 | J1V4M2 |
| 40.2 | J1V4M3 |
| 40.8 | J1V4M4 |
| 46.8 | J1V4M5 |
| 40.3 | J1V4M6 |
| 44.9 | J1V4M7 |
| 39.9 | J1V4M8 |
| 41.8 | J1V4M9 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 15 | Mean | 41.9 |
| Censored | | Lognormal mean | 41.9 |
| Detection limit or PQL | | Std. devn. | 3.0 |
| Method detection limit | | Median | 41.2 |
| TOTAL | 15 | Min. | 36.7 |
| | | Max. | 47.4 |

Lognormal distribution? r-squared is: 0.949
Normal distribution? r-squared is: 0.943
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 43.3

### Zinc 95% UCL Calculation

| DATA | ID |
|---|---|
| 35.3 | J1V4L5/ J1V4N0 |
| 37.2 | J1V4L6 |
| 33.7 | J1V4L7 |
| 35.9 | J1V4L8 |
| 31.6 | J1V4L9 |
| 31.4 | J1V4M0 |
| 35.9 | J1V4M1 |
| 40.6 | J1V4M2 |
| 32.4 | J1V4M3 |
| 32.6 | J1V4M4 |
| 28.3 | J1V4M5 |
| 34.6 | J1V4M6 |
| 50.6 | J1V4M7 |
| 35.2 | J1V4M8 |
| 41.0 | J1V4M9 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 15 | Mean | 35.8 |
| Censored | | Lognormal mean | 35.8 |
| Detection limit or PQL | | Std. devn. | 5.3 |
| Method detection limit | | Median | 35.2 |
| TOTAL | 15 | Min. | 28.3 |
| | | Max. | 50.6 |

Lognormal distribution? r-squared is: 0.905
Normal distribution? r-squared is: 0.849
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 38.2

### Chloride 95% UCL Calculation

| DATA | ID |
|---|---|
| 7.4 | J1V4L5/ J1V4N0 |
| 10.0 | J1V4L6 |
| 7.4 | J1V4L7 |
| 7.9 | J1V4L8 |
| 6.9 | J1V4L9 |
| 7.1 | J1V4M0 |
| 9.7 | J1V4M1 |
| 8.5 | J1V4M2 |
| 7.9 | J1V4M3 |
| 7.8 | J1V4M4 |
| 7.2 | J1V4M5 |
| 11.8 | J1V4M6 |
| 8.4 | J1V4M7 |
| 7.0 | J1V4M8 |
| 16.7 | J1V4M9 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 15 | Mean | 8.8 |
| Censored | | Lognormal mean | 8.8 |
| Detection limit or PQL | | Std. devn. | 2.6 |
| Method detection limit | | Median | 7.9 |
| TOTAL | 15 | Min. | 6.9 |
| | | Max. | 16.7 |

Lognormal distribution? r-squared is: 0.785
Normal distribution? r-squared is: 0.684
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 9.9

### Fluoride 95% UCL Calculation

| DATA | ID |
|---|---|
| 0.99 | J1V4L5/ J1V4N0 |
| 0.94 | J1V4L6 |
| 1.0 | J1V4L7 |
| 1.1 | J1V4L8 |
| 0.40 | J1V4L9 |
| 0.9 | J1V4M0 |
| 1.10 | J1V4M1 |
| 1.5 | J1V4M2 |
| 1.1 | J1V4M3 |
| 1.1 | J1V4M4 |
| 1.8 | J1V4M5 |
| 3.0 | J1V4M6 |
| 2.7 | J1V4M7 |
| 1.4 | J1V4M8 |
| 3.3 | J1V4M9 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 15 | Mean | 1.5 |
| Censored | | Lognormal mean | 1.5 |
| Detection limit or PQL | | Std. devn. | 0.85 |
| Method detection limit | | Median | 1.1 |
| TOTAL | 15 | Min. | 0.40 |
| | | Max. | 3.3 |

Lognormal distribution? r-squared is: 0.897
Normal distribution? r-squared is: 0.818
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 1.8

### Sulfate 95% UCL Calculation

| DATA | ID |
|---|---|
| 6.8 | J1V4L5/ J1V4N0 |
| 8.8 | J1V4L6 |
| 7.3 | J1V4L7 |
| 8.6 | J1V4L8 |
| 6.3 | J1V4L9 |
| 7.2 | J1V4M0 |
| 20.3 | J1V4M1 |
| 12.9 | J1V4M2 |
| 7.9 | J1V4M3 |
| 8.7 | J1V4M4 |
| 9.6 | J1V4M5 |
| 181 | J1V4M6 |
| 8.1 | J1V4M7 |
| 7.2 | J1V4M8 |
| 223 | J1V4M9 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 15 | Mean | 34.9 |
| Censored | | Lognormal mean | 25.4 |
| Detection limit or PQL | | Std. devn. | 68.4 |
| Method detection limit | | Median | 8.6 |
| TOTAL | 15 | Min. | 6.3 |
| | | Max. | 223 |

Lognormal distribution? r-squared is: 0.606
Normal distribution? r-squared is: 0.448
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 64.0

### TPH - Diesel EXT 95% UCL Calculation

| DATA | ID |
|---|---|
| 800 | J1V4L5/ J1V4N0 |
| 6800 | J1V4L6 |
| 1900 | J1V4L7 |
| 8100 | J1V4L8 |
| 3500 | J1V4L9 |
| 500 | J1V4M0 |
| 7400 | J1V4M1 |
| 2600 | J1V4M2 |
| 6000 | J1V4M3 |
| 2700 | J1V4M4 |
| 1500 | J1V4M5 |
| 20000 | J1V4M6 |
| 5300 | J1V4M7 |
| 3500 | J1V4M8 |
| 38000 | J1V4M9 |

| | | | |
|---|---|---|---|
| Number of samples | | Uncensored values | |
| Uncensored | 15 | Mean | 7240 |
| Censored | | Lognormal mean | 7518 |
| Detection limit or PQL | | Std. devn. | 9760 |
| Method detection limit | | Median | 3500 |
| TOTAL | 15 | Min. | 500 |
| | | Max. | 38000 |

Lognormal distribution? r-squared is: 0.978
Normal distribution? r-squared is: 0.621
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 18381

**CALCULATION SHEET**

***Washington Closure Hanford***

| | | | |
|---|---|---|---|
| **Originator** I. B. Berezovskiy | **Date** 07/13/15 | **Calc. No.** 0100H-CA-V0230 | **Rev. No.** 0 |
| **Project** 100-H Area Closure Operations | **Job No.** 14655 | **Checked** J. D. Skoglie | **Date** 07/13/15 |
| **Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations | | | **Sheet No.** 36 of 43 |

**Ecology Software (MTCAStat) Results, 100-H-28:2 and 100-H-42 Waste Sites Staging Pile Area**

### TPH - Diesel 95% UCL Calculation

| DATA | ID |
|---|---|
| 1210 | J1V4L5/ J1V4N0 |
| 3100 | J1V4L6 |
| 1800 | J1V4L7 |
| 5400 | J1V4L8 |
| 2300 | J1V4L9 |
| 340 | J1V4M0 |
| 4200 | J1V4M1 |
| 2300 | J1V4M2 |
| 4000 | J1V4M3 |
| 2200 | J1V4M4 |
| 1800 | J1V4M5 |
| 8400 | J1V4M6 |
| 3300 | J1V4M7 |
| 2500 | J1V4M8 |
| 15000 | J1V4M9 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 15 | Mean | 3857 |
| Censored | | Lognormal mean | 4038 |
| Detection limit or PQL | | Std. devn. | 3640 |
| Method detection limit | | Median | 2500 |
| TOTAL | 15 | Min. | 340 |
| | | Max. | 15000 |

Lognormal distribution? r-squared is: 0.925
Normal distribution? r-squared is: 0.709
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 7260

### Benzo(a)anthracene (Method 8310) 95% UCL Calculation

| DATA | ID |
|---|---|
| 1.6 | J1V4L5/ J1V4N0 |
| 3.8 | J1V4L6 |
| 1.6 | J1V4L7 |
| 5.1 | J1V4L8 |
| 1.6 | J1V4L9 |
| 1.5 | J1V4M0 |
| 29 | J1V4M1 |
| 1.7 | J1V4M2 |
| 51 | J1V4M3 |
| 23 | J1V4M4 |
| 1.6 | J1V4M5 |
| 6.2 | J1V4M6 |
| 16 | J1V4M7 |
| 8.9 | J1V4M8 |
| 29 | J1V4M9 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 15 | Mean | 12 |
| Censored | | Lognormal mean | 13 |
| Detection limit or PQL | | Std. devn. | 15 |
| Method detection limit | | Median | 5.1 |
| TOTAL | 15 | Min. | 1.5 |
| | | Max. | 51 |

Lognormal distribution? r-squared is: 0.887
Normal distribution? r-squared is: 0.758
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 18

### Benzo(a)pyrene (Method 8310) 95% UCL Calculation

| DATA | ID |
|---|---|
| 3.2 | J1V4L5/ J1V4N0 |
| 3.3 | J1V4L6 |
| 3.2 | J1V4L7 |
| 16 | J1V4L8 |
| 3.2 | J1V4L9 |
| 3.1 | J1V4M0 |
| 42 | J1V4M1 |
| 3.3 | J1V4M2 |
| 38 | J1V4M3 |
| 26 | J1V4M4 |
| 3.2 | J1V4M5 |
| 19 | J1V4M6 |
| 22 | J1V4M7 |
| 9.3 | J1V4M8 |
| 30 | J1V4M9 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 15 | Mean | 15 |
| Censored | | Lognormal mean | 16 |
| Detection limit or PQL | | Std. devn. | 14 |
| Method detection limit | | Median | 9.3 |
| TOTAL | 15 | Min. | 3.1 |
| | | Max. | 42 |

Lognormal distribution? r-squared is: 0.829
Normal distribution? r-squared is: 0.843
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 21

### Benzo(b)fluoranthene (Method 8310) 95% UCL Calculation

| DATA | ID |
|---|---|
| 2.1 | J1V4L5/ J1V4N0 |
| 2.1 | J1V4L6 |
| 2.1 | J1V4L7 |
| 16 | J1V4L8 |
| 2.1 | J1V4L9 |
| 2.0 | J1V4M0 |
| 44 | J1V4M1 |
| 2.2 | J1V4M2 |
| 31 | J1V4M3 |
| 28 | J1V4M4 |
| 2.1 | J1V4M5 |
| 22 | J1V4M6 |
| 19 | J1V4M7 |
| 7.7 | J1V4M8 |
| 35 | J1V4M9 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 15 | Mean | 14 |
| Censored | | Lognormal mean | 17 |
| Detection limit or PQL | | Std. devn. | 15 |
| Method detection limit | | Median | 7.7 |
| TOTAL | 15 | Min. | 2.0 |
| | | Max. | 44 |

Lognormal distribution? r-squared is: 0.816
Normal distribution? r-squared is: 0.842
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 21

### Fluoranthene (Method 8310) 95% UCL Calculation

| DATA | ID |
|---|---|
| 6.5 | J1V4L5/ J1V4N0 |
| 6.5 | J1V4L6 |
| 6.5 | J1V4L7 |
| 27 | J1V4L8 |
| 6.5 | J1V4L9 |
| 6.0 | J1V4M0 |
| 75 | J1V4M1 |
| 6.5 | J1V4M2 |
| 110 | J1V4M3 |
| 52 | J1V4M4 |
| 6.5 | J1V4M5 |
| 52 | J1V4M6 |
| 32 | J1V4M7 |
| 16 | J1V4M8 |
| 74 | J1V4M9 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 15 | Mean | 32 |
| Censored | | Lognormal mean | 35 |
| Detection limit or PQL | | Std. devn. | 33 |
| Method detection limit | | Median | 16 |
| TOTAL | 15 | Min. | 6.0 |
| | | Max. | 110 |

Lognormal distribution? r-squared is: 0.844
Normal distribution? r-squared is: 0.807
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 46

### Pyrene (Method 8310) 95% UCL Calculation

| DATA | ID |
|---|---|
| 6.0 | J1V4L5/ J1V4N0 |
| 6.0 | J1V4L6 |
| 6.0 | J1V4L7 |
| 33 | J1V4L8 |
| 6.0 | J1V4L9 |
| 5.5 | J1V4M0 |
| 79 | J1V4M1 |
| 6.0 | J1V4M2 |
| 120 | J1V4M3 |
| 59 | J1V4M4 |
| 6.0 | J1V4M5 |
| 46 | J1V4M6 |
| 46 | J1V4M7 |
| 22 | J1V4M8 |
| 71 | J1V4M9 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 15 | Mean | 34.5 |
| Censored | | Lognormal mean | 38.7 |
| Detection limit or PQL | | Std. devn. | 35.2 |
| Method detection limit | | Median | 22.0 |
| TOTAL | 15 | Min. | 5.5 |
| | | Max. | 120 |

Lognormal distribution? r-squared is: 0.836
Normal distribution? r-squared is: 0.826
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 49

### Pyrene (Method 8270) 95% UCL Calculation

| DATA | ID |
|---|---|
| 6.0 | J1V4L5/ J1V4N0 |
| 13 | J1V4L6 |
| 6.0 | J1V4L7 |
| 210 | J1V4L8 |
| 6.0 | J1V4L9 |
| 6.0 | J1V4M0 |
| 35 | J1V4M1 |
| 6.5 | J1V4M2 |
| 6.5 | J1V4M3 |
| 25 | J1V4M4 |
| 6.0 | J1V4M5 |
| 34 | J1V4M6 |
| 29 | J1V4M7 |
| 89 | J1V4M8 |
| 60 | J1V4M9 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 15 | Mean | 36 |
| Censored | | Lognormal mean | 35 |
| Detection limit or PQL | | Std. devn. | 54 |
| Method detection limit | | Median | 13 |
| TOTAL | 15 | Min. | 6.0 |
| | | Max. | 210 |

Lognormal distribution? r-squared is: 0.859
Normal distribution? r-squared is: 0.594
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 59

**CALCULATION SHEET**

*Washington Closure Hanford*

**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 37 of 43

**Ecology Software (MTCAStat) Results, 100-H-28:2 and 100-H-42 Waste Sites Overburden**

### Arsenic 95% UCL Calculation

| DATA | ID |
|---|---|
| 5.0 | J1V4N1/ J1V4N3 |
| 4.9 | J1V255 |
| 4.0 | J1V256 |
| 8.2 | J1V257 |
| 6.9 | J1V258 |
| 3.9 | J1V259 |
| 15.8 | J1V260 |
| 5.2 | J1V261 |
| 7.2 | J1V262 |
| 8.5 | J1V264 |
| 6.4 | J1V265 |
| 5.5 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 6.8 |
| Censored | | Lognormal mean | 6.8 |
| Detection limit or PQL | | Std. devn. | 3.2 |
| Method detection limit | | Median | 6.0 |
| TOTAL | 12 | Min. | 3.9 |
| | | Max. | 15.8 |

Lognormal distribution? r-squared is: 0.908
Normal distribution? r-squared is: 0.908
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 8.6

### Barium 95% UCL Calculation

| DATA | ID |
|---|---|
| 43.2 | J1V4N1/ J1V4N3 |
| 58.7 | J1V255 |
| 66.9 | J1V256 |
| 55.1 | J1V257 |
| 53.2 | J1V258 |
| 52.3 | J1V259 |
| 54.5 | J1V260 |
| 47.7 | J1V261 |
| 39.1 | J1V262 |
| 47.2 | J1V264 |
| 44.5 | J1V265 |
| 52.9 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 51.3 |
| Censored | | Lognormal mean | 51.3 |
| Detection limit or PQL | | Std. devn. | 7.5 |
| Method detection limit | | Median | 52.6 |
| TOTAL | 12 | Min. | 39.1 |
| | | Max. | 66.9 |

Lognormal distribution? r-squared is: 0.973
Normal distribution? r-squared is: 0.963
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 55.6

### Cadmium 95% UCL Calculation

| DATA | ID |
|---|---|
| 0.15 | J1V4N1/ J1V4N3 |
| 0.064 | J1V255 |
| 0.11 | J1V256 |
| 0.067 | J1V257 |
| 0.042 | J1V258 |
| 0.075 | J1V259 |
| 0.021 | J1V260 |
| 0.088 | J1V261 |
| 0.038 | J1V262 |
| 0.053 | J1V264 |
| 0.049 | J1V265 |
| 0.17 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 0.077 |
| Censored | | Lognormal mean | 0.079 |
| Detection limit or PQL | | Std. devn. | 0.045 |
| Method detection limit | | Median | 0.066 |
| TOTAL | 12 | Min. | 0.021 |
| | | Max. | 0.17 |

Lognormal distribution? r-squared is: 0.980
Normal distribution? r-squared is: 0.906
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 0.12

### Chromium 95% UCL Calculation

| DATA | ID |
|---|---|
| 10.4 | J1V4N1/ J1V4N3 |
| 8.3 | J1V255 |
| 13.8 | J1V256 |
| 9.6 | J1V257 |
| 24.4 | J1V258 |
| 13.7 | J1V259 |
| 10.0 | J1V260 |
| 12.1 | J1V261 |
| 8.3 | J1V262 |
| 8.8 | J1V264 |
| 8.6 | J1V265 |
| 10.9 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 11.6 |
| Censored | | Lognormal mean | 11.5 |
| Detection limit or PQL | | Std. devn. | 4.5 |
| Method detection limit | | Median | 10.2 |
| TOTAL | 12 | Min. | 8.3 |
| | | Max. | 24.4 |

Lognormal distribution? r-squared is: 0.824
Normal distribution? r-squared is: 0.688
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 13.7

### Cobalt 95% UCL Calculation

| DATA | ID |
|---|---|
| 5.9 | J1V4N1/ J1V4N3 |
| 4.9 | J1V255 |
| 6.2 | J1V256 |
| 5.8 | J1V257 |
| 5.8 | J1V258 |
| 6.2 | J1V259 |
| 6.7 | J1V260 |
| 5.7 | J1V261 |
| 5.6 | J1V262 |
| 5.9 | J1V264 |
| 5.4 | J1V265 |
| 7.3 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 6.0 |
| Censored | | Lognormal mean | 6.0 |
| Detection limit or PQL | | Std. devn. | 0.61 |
| Method detection limit | | Median | 5.9 |
| TOTAL | 12 | Min. | 4.9 |
| | | Max. | 7.3 |

Lognormal distribution? r-squared is: 0.941
Normal distribution? r-squared is: 0.925
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 6.3

### Copper 95% UCL Calculation

| DATA | ID |
|---|---|
| 13.0 | J1V4N1/ J1V4N3 |
| 13.0 | J1V255 |
| 15.1 | J1V256 |
| 14.2 | J1V257 |
| 19.2 | J1V258 |
| 18.7 | J1V259 |
| 14.8 | J1V260 |
| 14.2 | J1V261 |
| 15.0 | J1V262 |
| 15.6 | J1V264 |
| 12.4 | J1V265 |
| 14.1 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 14.9 |
| Censored | | Lognormal mean | 14.9 |
| Detection limit or PQL | | Std. devn. | 2.1 |
| Method detection limit | | Median | 14.5 |
| TOTAL | 12 | Min. | 12.4 |
| | | Max. | 19.2 |

Lognormal distribution? r-squared is: 0.902
Normal distribution? r-squared is: 0.867
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 16.1

### Hexavalent Chromium 95% UCL Calculation

| DATA | ID |
|---|---|
| 0.305 | J1V4N1/ J1V4N3 |
| 0.233 | J1V255 |
| 0.320 | J1V256 |
| 0.276 | J1V257 |
| 0.607 | J1V258 |
| 0.273 | J1V259 |
| 0.318 | J1V260 |
| 0.319 | J1V261 |
| 0.274 | J1V262 |
| 0.341 | J1V264 |
| 0.249 | J1V265 |
| 0.315 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 0.319 |
| Censored | | Lognormal mean | 0.319 |
| Detection limit or PQL | | Std. devn. | 0.0963 |
| Method detection limit | | Median | 0.310 |
| TOTAL | 12 | Min. | 0.233 |
| | | Max. | 0.607 |

Lognormal distribution? r-squared is: 0.748
Normal distribution? r-squared is: 0.619
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.365

### Lead 95% UCL Calculation

| DATA | ID |
|---|---|
| 13.5 | J1V4N1/ J1V4N3 |
| 14.4 | J1V255 |
| 6.5 | J1V256 |
| 24.2 | J1V257 |
| 14.8 | J1V258 |
| 6.7 | J1V259 |
| 53.5 | J1V260 |
| 13.3 | J1V261 |
| 24.8 | J1V262 |
| 26.3 | J1V264 |
| 18.6 | J1V265 |
| 16.2 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 19.4 |
| Censored | | Lognormal mean | 19.6 |
| Detection limit or PQL | | Std. devn. | 12.5 |
| Method detection limit | | Median | 15.5 |
| TOTAL | 12 | Min. | 6.5 |
| | | Max. | 53.5 |

Lognormal distribution? r-squared is: 0.935
Normal distribution? r-squared is: 0.779
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 29.1

### Manganese 95% UCL Calculation

| DATA | ID |
|---|---|
| 239 | J1V4N1/ J1V4N3 |
| 212 | J1V255 |
| 262 | J1V256 |
| 242 | J1V257 |
| 255 | J1V258 |
| 317 | J1V259 |
| 285 | J1V260 |
| 248 | J1V261 |
| 244 | J1V262 |
| 262 | J1V264 |
| 227 | J1V265 |
| 265 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 255 |
| Censored | | Lognormal mean | 255 |
| Detection limit or PQL | | Std. devn. | 27.3 |
| Method detection limit | | Median | 252 |
| TOTAL | 12 | Min. | 212 |
| | | Max. | 317 |

Lognormal distribution? r-squared is: 0.953
Normal distribution? r-squared is: 0.930
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 270

**CALCULATION SHEET**

*Washington Closure Hanford*

**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 38 of 43

**Ecology Software (MTCAStat) Results, 100-H-28:2 and 100-H-42 Waste Sites Overburden**

### Mercury 95% UCL Calculation

| DATA | ID |
|---|---|
| 0.0033 | J1V4N1/ J1V4N3 |
| 0.0087 | J1V255 |
| 0.0063 | J1V256 |
| 0.0077 | J1V257 |
| 0.0088 | J1V258 |
| 0.0077 | J1V259 |
| 0.0084 | J1V260 |
| 0.0066 | J1V261 |
| 0.0026 | J1V262 |
| 0.0029 | J1V264 |
| 0.0070 | J1V265 |
| 0.0029 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 0.0061 |
| Censored | | Lognormal mean | 0.0062 |
| Detection limit or PQL | | Std. devn. | 0.0025 |
| Method detection limit | | Median | 0.0068 |
| TOTAL | 12 | Min. | 0.0026 |
| | | Max. | 0.0088 |

Lognormal distribution? r-squared is: 0.822
Normal distribution? r-squared is: 0.867
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 0.0070

### Nickel 95% UCL Calculation

| DATA | ID |
|---|---|
| 10.1 | J1V4N1/ J1V4N3 |
| 7.8 | J1V255 |
| 12.9 | J1V256 |
| 10.0 | J1V257 |
| 10.1 | J1V258 |
| 11.7 | J1V259 |
| 11.0 | J1V260 |
| 12.4 | J1V261 |
| 8.6 | J1V262 |
| 8.9 | J1V264 |
| 9.2 | J1V265 |
| 11.2 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 10.3 |
| Censored | | Lognormal mean | 10.3 |
| Detection limit or PQL | | Std. devn. | 1.6 |
| Method detection limit | | Median | 10.1 |
| TOTAL | 12 | Min. | 7.8 |
| | | Max. | 12.9 |

Lognormal distribution? r-squared is: 0.985
Normal distribution? r-squared is: 0.985
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 11.2

### Vanadium 95% UCL Calculation

| DATA | ID |
|---|---|
| 40.4 | J1V4N1/ J1V4N3 |
| 31.9 | J1V255 |
| 42.8 | J1V256 |
| 39.6 | J1V257 |
| 39.8 | J1V258 |
| 41.7 | J1V259 |
| 43.8 | J1V260 |
| 39.8 | J1V261 |
| 33.0 | J1V262 |
| 43.2 | J1V264 |
| 40.1 | J1V265 |
| 45.9 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 40.2 |
| Censored | | Lognormal mean | 40.2 |
| Detection limit or PQL | | Std. devn. | 4.1 |
| Method detection limit | | Median | 40.3 |
| TOTAL | 12 | Min. | 31.9 |
| | | Max. | 45.9 |

Lognormal distribution? r-squared is: 0.846
Normal distribution? r-squared is: 0.877
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 42.1

### Zinc 95% UCL Calculation

| DATA | ID |
|---|---|
| 31.6 | J1V4N1/ J1V4N3 |
| 28.4 | J1V255 |
| 39.9 | J1V256 |
| 35.4 | J1V257 |
| 36.3 | J1V258 |
| 34.2 | J1V259 |
| 38.6 | J1V260 |
| 35.9 | J1V261 |
| 28.6 | J1V262 |
| 34.9 | J1V264 |
| 33.9 | J1V265 |
| 36.1 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 34.5 |
| Censored | | Lognormal mean | 34.5 |
| Detection limit or PQL | | Std. devn. | 3.5 |
| Method detection limit | | Median | 35.2 |
| TOTAL | 12 | Min. | 28.4 |
| | | Max. | 39.9 |

Lognormal distribution? r-squared is: 0.919
Normal distribution? r-squared is: 0.938
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 36.5

### Chloride 95% UCL Calculation

| DATA | ID |
|---|---|
| 8.6 | J1V4N1/ J1V4N3 |
| 8.4 | J1V255 |
| 27.0 | J1V256 |
| 8.9 | J1V257 |
| 7.3 | J1V258 |
| 7.2 | J1V259 |
| 7.2 | J1V260 |
| 7.1 | J1V261 |
| 10.6 | J1V262 |
| 7.2 | J1V264 |
| 12.1 | J1V265 |
| 7.6 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 9.9 |
| Censored | | Lognormal mean | 9.8 |
| Detection limit or PQL | | Std. devn. | 5.6 |
| Method detection limit | | Median | 8.0 |
| TOTAL | 12 | Min. | 7.1 |
| | | Max. | 27.0 |

Lognormal distribution? r-squared is: 0.664
Normal distribution? r-squared is: 0.521
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 12.6

### Fluoride 95% UCL Calculation

| DATA | ID |
|---|---|
| 1.1 | J1V4N1/ J1V4N3 |
| 1.0 | J1V255 |
| 1.1 | J1V256 |
| 1.3 | J1V257 |
| 1.0 | J1V258 |
| 0.88 | J1V259 |
| 1.4 | J1V260 |
| 1.0 | J1V261 |
| 1.2 | J1V262 |
| 1.2 | J1V264 |
| 1.1 | J1V265 |
| 1.1 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 1.1 |
| Censored | | Lognormal mean | 1.1 |
| Detection limit or PQL | | Std. devn. | 0.15 |
| Method detection limit | | Median | 1.1 |
| TOTAL | 12 | Min. | 0.88 |
| | | Max. | 1.4 |

Lognormal distribution? r-squared is: 0.966
Normal distribution? r-squared is: 0.955
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 1.2

### Nitrogen in nitrate and nitrite 95% UCL Calculation

| DATA | ID |
|---|---|
| 0.52 | J1V4N1/ J1V4N3 |
| 0.20 | J1V255 |
| 0.20 | J1V256 |
| 2.4 | J1V257 |
| 0.45 | J1V258 |
| 0.20 | J1V259 |
| 0.47 | J1V260 |
| 0.19 | J1V261 |
| 1.5 | J1V262 |
| 0.70 | J1V264 |
| 1.3 | J1V265 |
| 0.19 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 0.69 |
| Censored | | Lognormal mean | 0.70 |
| Detection limit or PQL | | Std. devn. | 0.69 |
| Method detection limit | | Median | 0.46 |
| TOTAL | 12 | Min. | 0.19 |
| | | Max. | 2.4 |

Lognormal distribution? r-squared is: 0.888
Normal distribution? r-squared is: 0.761
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 1.0

### Sulfate 95% UCL Calculation

| DATA | ID |
|---|---|
| 9.9 | J1V4N1/ J1V4N3 |
| 13.5 | J1V255 |
| 40.4 | J1V256 |
| 25.8 | J1V257 |
| 9.8 | J1V258 |
| 8.1 | J1V259 |
| 9.7 | J1V260 |
| 8.1 | J1V261 |
| 15.8 | J1V262 |
| 8.3 | J1V264 |
| 24.3 | J1V265 |
| 8.3 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 15.2 |
| Censored | | Lognormal mean | 15.1 |
| Detection limit or PQL | | Std. devn. | 10.1 |
| Method detection limit | | Median | 9.9 |
| TOTAL | 12 | Min. | 8.1 |
| | | Max. | 40.4 |

Lognormal distribution? r-squared is: 0.842
Normal distribution? r-squared is: 0.741
Recommendations:
Reject BOTH lognormal and normal distributions

UCL (based on Z-statistic) is 20.0

### TPH - Diesel EXT 95% UCL Calculation

| DATA | ID |
|---|---|
| 4200 | J1V4N1/ J1V4N3 |
| 1500 | J1V255 |
| 5600 | J1V256 |
| 4200 | J1V257 |
| 2300 | J1V258 |
| 2800 | J1V259 |
| 2800 | J1V260 |
| 3100 | J1V261 |
| 3000 | J1V262 |
| 3200 | J1V264 |
| 2600 | J1V265 |
| 7800 | J1V4N2 |

| Number of samples | | Uncensored values | |
|---|---|---|---|
| Uncensored | 12 | Mean | 3592 |
| Censored | | Lognormal mean | 3606 |
| Detection limit or PQL | | Std. devn. | 1692 |
| Method detection limit | | Median | 3050 |
| TOTAL | 12 | Min. | 1500 |
| | | Max. | 7800 |

Lognormal distribution? r-squared is: 0.943
Normal distribution? r-squared is: 0.836
Recommendations:
Use lognormal distribution.

UCL (Land's method) is 4702

**CALCULATION SHEET**

***Washington Closure Hanford***

**Originator** I. B. Berezovskiy
**Project** 100-H Area Closure Operations
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations

**Date** 07/13/15
**Job No.** 14655

**Calc. No.** 0100H-CA-V0230
**Checked** J. D. Skoglie

**Rev. No.** 0
**Date** 07/13/15
**Sheet No.** 39 of 43

**Ecology Software (MTCAStat) Results, 100-H-28:2 and 100-H-42 Waste Sites Overburden**

| | DATA | ID | TPH - Diesel 95% UCL Calculation | | | | DATA | ID | Pyrene (Method 8270) 95% UCL Calculation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | | |
| 2 | 2600 | J1V4N1/ J1V4N3 | | | | | 6.3 | J1V4N1/ J1V4N3 | | | | |
| 3 | 970 | J1V255 | | | | | 24 | J1V255 | | | | |
| 4 | 2500 | J1V256 | Number of samples | | Uncensored values | | 6.5 | J1V256 | Number of samples | | Uncensored values | |
| 5 | 2100 | J1V257 | Uncensored | 12 | Mean | 1995 | 72 | J1V257 | Uncensored | 12 | Mean | 25 |
| 6 | 970 | J1V258 | Censored | | Lognormal mean | 1980 | 58 | J1V258 | Censored | | Lognormal mean | 26 |
| 7 | 1600 | J1V259 | Detection limit or PQL | | Std. devn. | 1251 | 16 | J1V259 | Detection limit or PQL | | Std. devn. | 24 |
| 8 | 1700 | J1V260 | Method detection limit | | Median | 1650 | 23 | J1V260 | Method detection limit | | Median | 15 |
| 9 | 1800 | J1V261 | TOTAL | 12 | Min. | 970 | 13 | J1V261 | TOTAL | 12 | Min. | 6.0 |
| 10 | 1400 | J1V262 | | | Max. | 5600 | 6.0 | J1V262 | | | Max. | 72 |
| 11 | 1300 | J1V264 | | | | | 6.0 | J1V264 | | | | |
| 12 | 1400 | J1V265 | | | | | 6.5 | J1V265 | | | | |
| 13 | 5600 | J1V4N2 | | | | | 61 | J1V4N2 | | | | |
| 14 | | | | | | | | | | | | |
| 15 | | | Lognormal distribution? | | Normal distribution? | | | | Lognormal distribution? | | Normal distribution? | |
| 16 | | | r-squared is: | 0.905 | r-squared is: | 0.693 | | | r-squared is: | 0.877 | r-squared is: | 0.779 |
| 17 | | | Recommendations: | | | | | | Recommendations: | | | |
| 18 | | | Use lognormal distribution. | | | | | | Reject BOTH lognormal and normal distributions | | | |
| 19 | | | | | | | | | | | | |
| 20 | | | UCL (Land's method) is | | 2696 | | | | UCL (based on Z-statistic) is | | 36 | |

**CALCULATION SHEET**

***Washington Closure Hanford***

**Originator** I. B. Berezovskiy **Date** 07/13/15 **Calc. No.** 0100H-CA-V0230 **Rev. No.** 0
**Project** 100-H Area Closure Operations **Job No.** 14655 **Checked** J. D. Skoglie **Date** 07/13/15
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations **Sheet No.** 40 of 43

**Duplicate Analysis - 100-H-28:2 and 100-H-42 Waste Sites EXC1**

| Sampling Area | Sample Number | Sample Date | Potassium-40 | | | Aluminum | | | Arsenic | | | Barium | | | Beryllium | | | Cadmium | | | Calcium | | | Chromium | | | Cobalt | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | pCi/g | Q | MDA | 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 |
| EXC1-4 | J1V272 | 12/15/14 | 16.7 | | 0.268 | 8020 | X | 1.5 | 4.9 | J | 0.63 | 72.1 | | 0.073 | 0.055 | B | 0.032 | 0.12 | B | 0.039 | 3910 | X | 13.5 | 16.2 | | 0.055 | 5.8 | X | 0.096 |
| Duplicate of J1V272 | J1V285 | 12/15/14 | 16.8 | | 0.251 | 7510 | X | 1.5 | 5.2 | J | 0.64 | 66.7 | | 0.074 | 0.040 | B | 0.032 | 0.13 | B | 0.040 | 3760 | X | 13.6 | 15.8 | | 0.056 | 5.7 | X | 0.097 |

**Analysis:**

| TDL | | 0.5 | 5 | 10 | 2 | 0.5 | 0.2 | 100 | 1 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| Duplicate Analysis | Both > PQL? | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** |
| | Both >5xTDL? | **Yes (calc RPD)** | **Yes (calc RPD)** | No-Stop (acceptable) | **Yes (calc RPD)** | No-Stop (acceptable) | No-Stop (acceptable) | **Yes (calc RPD)** | **Yes (calc RPD)** | No-Stop (acceptable) |
| | RPD | 0.6% | 6.6% | | 7.8% | | | 3.9% | 2.5% | |
| | Difference > 2 TDL? | Not applicable | Not applicable | No - acceptable | Not applicable | No - acceptable | No - acceptable | Not applicable | Not applicable | No - acceptable |

**Duplicate Analysis - 100-H-28:2 and 100-H-42 Waste Sites EXC1**

| Sampling Area | HEIS Number | Sample Date | Copper | | | Iron | | | Lead | | | Magnesium | | | Manganese | | | Mercury | | | Nickel | | | Potassium | | | Silicon | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 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 | mg/kg | Q | PQL |
| EXC1-4 | J1V272 | 12/15/14 | 12.3 | | 0.21 | 15900 | | 3.6 | 6.3 | XJ | 0.26 | 5100 | X | 3.5 | 227 | X | 0.096 | 0.029 | | 0.0057 | 15 | X | 0.12 | 1030 | | 39.2 | 233 | NJ | 5.4 |
| Duplicate of J1V272 | J1V285 | 12/15/14 | 12.3 | | 0.21 | 15600 | | 3.7 | 8.2 | XJ | 0.26 | 4850 | X | 3.6 | 217 | X | 0.097 | 0.040 | | 0.0059 | 14.6 | X | 0.12 | 975 | | 39.7 | 218 | NJ | 5.5 |

**Analysis:**

| TDL | | 1 | 5 | 5 | 75 | 5 | 0.2 | 4 | 400 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| Duplicate Analysis | Both > PQL? | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** |
| | Both >5xTDL? | **Yes (calc RPD)** | **Yes (calc RPD)** | No-Stop (acceptable) | **Yes (calc RPD)** | **Yes (calc RPD)** | No-Stop (acceptable) | No-Stop (acceptable) | No-Stop (acceptable) | **Yes (calc RPD)** |
| | RPD | 0.0% | 1.9% | | 5.0% | 4.5% | | | | 6.7% |
| | Difference > 2 TDL? | Not applicable | Not applicable | No - acceptable | Not applicable | Not applicable | No - acceptable | No - acceptable | No - acceptable | Not applicable |

**Duplicate Analysis - 100-H-28:2 and 100-H-42 Waste Sites EXC1**

| Sampling Area | HEIS Number | Sample Date | Sodium | | | Vanadium | | | Zinc | | | Fluoride | | | Nitrogen in Nitrate | | | Phosphorus in phosphate | | | Sulfate | | | TPH - Diesel EXT | | | TPH - Diesel | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 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 | ug/kg | Q | PQL | ug/kg | Q | PQL |
| EXC1-4 | J1V272 | 12/15/14 | 299 | | 56.4 | 30.8 | | 0.090 | 41.4 | X | 0.38 | 1.6 | B | 0.89 | 0.88 | BJ | 0.34 | 2.4 | BJ | 1.3 | 13.2 | | 1.8 | 2900 | J | 1100 | 1300 | J | 730 |
| Duplicate of J1V272 | J1V285 | 12/15/14 | 290 | | 57.1 | 31.3 | | 0.091 | 42.3 | X | 0.38 | 1.5 | B | 0.88 | 1.1 | BJ | 0.34 | 2.6 | BJ | 1.3 | 13.8 | | 1.8 | 3400 | J | 1000 | 1800 | J | 710 |

**Analysis:**

| TDL | | 50 | 2.5 | 1 | 5 | 0.75 | 10 | 5 | 5000 | 5000 |
|---|---|---|---|---|---|---|---|---|---|---|
| Duplicate Analysis | Both > PQL? | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** | **Yes (continue)** |
| | Both >5xTDL? | **Yes (calc RPD)** | **Yes (calc RPD)** | **Yes (calc RPD)** | No-Stop (acceptable) | No-Stop (acceptable) | No-Stop (acceptable) | No-Stop (acceptable) | No-Stop (acceptable) | No-Stop (acceptable) |
| | RPD | 3.1% | 1.6% | 2.2% | | | | | | |
| | Difference > 2 TDL? | Not applicable | Not applicable | Not applicable | No - acceptable | No - acceptable | No - acceptable | No - acceptable | No - acceptable | No - acceptable |

**Duplicate Analysis - 100-H-28:2 and 100-H-42 Waste Sites EXC1**

| Sampling Area | Sample Number | Sample Date | Aroclor-1254 | | | DDT | | |
|---|---|---|---|---|---|---|---|---|
| | | | ug/kg | Q | PQL | ug/kg | Q | PQL |
| EXC1-4 | J1V272 | 12/15/14 | 15 | | 2.6 | 0.74 | J | 0.63 |
| Duplicate of J1V272 | J1V285 | 12/15/14 | 24 | | 2.6 | 1.1 | J | 0.64 |

**Analysis:**

| TDL | | 20 | 5 |
|---|---|---|---|
| Duplicate Analysis | Both > PQL? | **Yes (continue)** | **Yes (continue)** |
| | Both >5xTDL? | No-Stop (acceptable) | No-Stop (acceptable) |
| | RPD | | |
| | Difference > 2 TDL? | No - acceptable | No - acceptable |

**CALCULATION SHEET**

***Washington Closure Hanford***

**Originator** I. B. Berezovskiy **Date** 07/13/15 **Calc. No.** 0100H-CA-V0230 **Rev. No.** 0
**Project** 100-H Area Closure Operations **Job No.** 14655 **Checked** J. D. Skoglie **Date** 07/13/15
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations **Sheet No.** 41 of 43

**Duplicate Analysis - 100-H-28:2 and 100-H-42 Waste Sites EXC2**

| Sampling Area | Sample Number | Sample Date | Potassium-40 | | | Aluminum | | | Arsenic | | | Barium | | | Cadmium | | | Calcium | | | Chromium | | | Cobalt | | | Copper | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | pCi/g | Q | MDA | 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 |
| EXC2-7 | J1V292 | 12/12/14 | 12.5 | | 0.201 | 5720 | | 1.6 | 3.4 | | 0.68 | 54.1 | | 0.078 | 0.11 | B | 0.042 | 5420 | | 14.5 | 9.0 | | 0.060 | 6.5 | | 0.10 | 14.4 | | 0.22 |
| Duplicate of J1V292 | J1V298 | 12/12/14 | 11.8 | | 0.199 | 5700 | | 1.6 | 4.0 | | 0.66 | 57.6 | | 0.076 | 0.097 | B | 0.041 | 5640 | | 14.1 | 8.1 | | 0.058 | 6.0 | | 0.10 | 12.8 | | 0.22 |

**Analysis:**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TDL | | 0.5 | 5 | 10 | 2 | 0.2 | 100 | 1 | 2 | 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? | **Yes (calc RPD)** | **Yes (calc RPD)** | No-Stop (acceptable) | **Yes (calc RPD)** | No-Stop (acceptable) | **Yes (calc RPD)** | **Yes (calc RPD)** | No-Stop (acceptable) | **Yes (calc RPD)** |
| | RPD | 5.8% | 0.4% | | 6.3% | | 4.0% | 10.5% | | 11.8% |
| | Difference > 2 TDL? | Not applicable | Not applicable | No - acceptable | Not applicable | No - acceptable | Not applicable | Not applicable | No - acceptable | Not applicable |

**Duplicate Analysis - 100-H-28:2 and 100-H-42 Waste Sites EXC2**

| Sampling Area | HEIS Number | Sample Date | Iron | | | Lead | | | Magnesium | | | Manganese | | | Nickel | | | Potassium | | | Silicon | | | Sodium | | | Vanadium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 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 | mg/kg | Q | PQL |
| EXC2-7 | J1V292 | 12/12/14 | 17200 | | 3.9 | 9.4 | | 0.28 | 3800 | | 3.8 | 238 | | 0.10 | 10.4 | | 0.13 | 780 | | 42.2 | 173 | N | 5.8 | 197 | | 60.8 | 43.9 | | 0.097 |
| Duplicate of J1V292 | J1V298 | 12/12/14 | 16300 | | 3.8 | 9.7 | | 0.27 | 3670 | | 3.7 | 267 | | 0.10 | 10.0 | | 0.12 | 733 | | 41.1 | 154 | N | 5.7 | 234 | | 59.1 | 39.3 | | 0.094 |

**Analysis:**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TDL | | 5 | 5 | 75 | 5 | 4 | 400 | 2 | 50 | 2.5 |
| Duplicate Analysis | Both > PQL? | **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)** | **Yes (calc RPD)** | No-Stop (acceptable) | No-Stop (acceptable) | **Yes (calc RPD)** | No-Stop (acceptable) | **Yes (calc RPD)** |
| | RPD | 5.4% | | 3.5% | 11.5% | | | 11.6% | | 11.1% |
| | Difference > 2 TDL? | Not applicable | No - acceptable | Not applicable | Not applicable | No - acceptable | No - acceptable | Not applicable | No - acceptable | Not applicable |

**Duplicate Analysis - 100-H-28:2 and 100-H-42 Waste Sites EXC2**

| Sampling Area | HEIS Number | Sample Date | Zinc | | | Fluoride | | | Nitrogen in Nitrate | | | Sulfate | | | TPH - Diesel EXT | | | Benzo(a)anthracene (Method 8310) | | | Benzo(a)pyrene (Method 8310) | | | Benzo(b)fluoranthene (Method 8310) | | | DDT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| EXC2-7 | J1V292 | 12/12/14 | 34.1 | | 0.41 | 1.0 | B | 0.84 | 0.85 | BJ | 0.32 | 9.6 | | 1.7 | 1900 | J | 1000 | 16 | | 3.0 | 13 | J | 6.1 | 17 | | 4.0 | 1.1 | J | 0.25 |
| Duplicate of J1V292 | J1V298 | 12/12/14 | 33.6 | | 0.40 | 1.1 | B | 0.81 | 0.86 | BJ | 0.31 | 8.6 | | 1.7 | 1300 | J | 1000 | 6.1 | J | 3.1 | 7.7 | J | 6.2 | 6.2 | JX | 4.1 | 1.6 | J | 0.25 |

**Analysis:**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TDL | | 1 | 5 | 0.75 | 5 | 5000 | 15 | 15 | 15 | 5 |
| Duplicate Analysis | Both > PQL? | **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) | No-Stop (acceptable) | No-Stop (acceptable) | No-Stop (acceptable) | No-Stop (acceptable) | No-Stop (acceptable) | No-Stop (acceptable) | No-Stop (acceptable) |
| | RPD | 1.5% | | | | | | | | |
| | Difference > 2 TDL? | Not applicable | No - acceptable | No - acceptable | No - acceptable | No - acceptable | No - acceptable | No - acceptable | No - acceptable | No - acceptable |

**CALCULATION SHEET**

***Washington Closure Hanford***

**Originator** I. B. Berezovskiy **Date** 07/13/15 **Calc. No.** 0100H-CA-V0230 **Rev. No.** 0
**Project** 100-H Area Closure Operations **Job No.** 14655 **Checked** J. D. Skoglie **Date** 07/13/15
**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations **Sheet No.** 42 of 43

**Duplicate Analysis - 100-H-28:2 and 100-H-42 Waste Sites SPA**

| Sampling Area | Sample Number | Sample Date | Potassium-40 | | | Aluminum | | | Arsenic | | | Barium | | | Beryllium | | | Cadmium | | | Calcium | | | Chromium | | | Cobalt | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | pCi/g | Q | MDA | 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 |
| SPA-1 | J1V4L5 | 2/26/15 | 16.0 | | 0.218 | 7050 | X | 1.4 | 3.7 | | 0.58 | 61.6 | X | 0.067 | 0.26 | | 0.029 | 0.11 | B | 0.036 | 8780 | X | 12.4 | 10.4 | | 0.051 | 5.9 | X | 0.088 |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 14.9 | | 0.180 | 6820 | X | 1.5 | 4.0 | | 0.62 | 61.8 | X | 0.071 | 0.26 | | 0.031 | 0.11 | B | 0.038 | 9000 | X | 13.2 | 9.9 | | 0.054 | 5.5 | X | 0.094 |

**Analysis:**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TDL | | | 0.5 | | | 5 | | | 10 | | | 2 | | | 0.5 | | | 0.2 | | | 100 | | | 1 | | | 2 | | |
| Duplicate Analysis | Both > PQL? | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | |
| | Both >5xTDL? | | Yes (calc RPD) | | | Yes (calc RPD) | | | No-Stop (acceptable) | | | Yes (calc RPD) | | | No-Stop (acceptable) | | | No-Stop (acceptable) | | | Yes (calc RPD) | | | Yes (calc RPD) | | | No-Stop (acceptable) | | |
| | RPD | | 7.1% | | | 3.3% | | | | | | 0.3% | | | | | | | | | 2.5% | | | 4.9% | | | | | |
| | Difference > 2 TDL? | | Not applicable | | | Not applicable | | | No - acceptable | | | Not applicable | | | No - acceptable | | | No - acceptable | | | Not applicable | | | Not applicable | | | No - acceptable | | |

**Duplicate Analysis - 100-H-28:2 and 100-H-42 Waste Sites SPA**

| Sampling Area | HEIS Number | Sample Date | Copper | | | Hexavalent Chromium | | | Iron | | | Lead | | | Magnesium | | | Manganese | | | Nickel | | | Potassium | | | Silicon | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 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 | mg/kg | Q | PQL |
| SPA-1 | J1V4L5 | 2/26/15 | 10.8 | X | 0.19 | 0.305 | | 0.155 | 18300 | X | 3.4 | 4.3 | | 0.24 | 5040 | X | 3.3 | 320 | X | 0.088 | 10.9 | X | 0.11 | 1180 | | 36.2 | 271 | NX | 5.0 |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 10.9 | X | 0.20 | 0.24 | | 0.155 | 16300 | X | 3.6 | 3.8 | | 0.25 | 4840 | X | 3.5 | 275 | X | 0.094 | 10.6 | X | 0.12 | 1200 | | 38.5 | 318 | NX | 5.3 |

**Analysis:**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TDL | | | 1 | | | 0.5 | | | 5 | | | 5 | | | 75 | | | 5 | | | 4 | | | 400 | | | 2 | | |
| Duplicate Analysis | Both > PQL? | | 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) | | | Yes (calc RPD) | | | Yes (calc RPD) | | | No-Stop (acceptable) | | | No-Stop (acceptable) | | | Yes (calc RPD) | | |
| | RPD | | 0.9% | | | | | | 11.6% | | | | | | 4.0% | | | 15.1% | | | | | | | | | 16.0% | | |
| | Difference > 2 TDL? | | Not applicable | | | No - acceptable | | | Not applicable | | | No - acceptable | | | Not applicable | | | Not applicable | | | No - acceptable | | | No - acceptable | | | Not applicable | | |

**Duplicate Analysis - 100-H-28:2 and 100-H-42 Waste Sites SPA**

| Sampling Area | HEIS Number | Sample Date | Sodium | | | Vanadium | | | Zinc | | | Chloride | | | Fluoride | | | Sulfate | | | TPH - Diesel | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | ug/kg | Q | PQL |
| SPA-1 | J1V4L5 | 2/26/15 | 175 | | 52.1 | 39.3 | | 0.083 | 36.3 | X | 0.35 | 7.6 | C | 2.0 | 0.99 | B | 0.82 | 6.8 | | 1.7 | 1500 | J | 700 |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 183 | | 55.3 | 34.0 | | 0.088 | 34.3 | X | 0.37 | 7.2 | C | 2.0 | 0.98 | B | 0.84 | 6.8 | | 1.7 | 920 | J | 690 |

**Analysis:**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TDL | | | 50 | | | 2.5 | | | 1 | | | 2 | | | 5 | | | 5 | | | 5000 | | | | | | | | |
| Duplicate Analysis | Both > PQL? | | 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) | | | No-Stop (acceptable) | | | No-Stop (acceptable) | | | | | | | | |
| | RPD | | | | | 14.5% | | | 5.7% | | | | | | | | | | | | | | | | | | | | |
| | Difference > 2 TDL? | | No - acceptable | | | Not applicable | | | Not applicable | | | No - acceptable | | | No - acceptable | | | No - acceptable | | | No - acceptable | | | | | | | | |

**CALCULATION SHEET**

*Washington Closure Hanford*

**Originator** I. B. Berezovskiy **Date** 07/13/15 **Calc. No.** 0100H-CA-V0230 **Rev. No.** 0

**Project** 100-H Area Closure Operations **Job No.** 14655 **Checked** J. D. Skoglie **Date** 07/13/15

**Subject** 100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations **Sheet No.** 43 of 43

**Duplicate Analysis - 100-H-28:2 and 100-H-42 Waste Sites OVB**

| Sampling Area | Sample Number | Sample Date | Potassium-40 | | | Aluminum | | | Arsenic | | | Barium | | | Beryllium | | | Cadmium | | | Calcium | | | Chromium | | | Cobalt | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | pCi/g | Q | MDA | 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 |
| OVB-9 | J1V4N1 | 2/26/15 | 14.9 | | 0.289 | 5960 | | 1.4 | 4.9 | | 0.62 | 43.9 | | 0.071 | 0.15 | B | 0.031 | 0.15 | B | 0.038 | 5380 | | 13.2 | 10.9 | X | 0.054 | 6.1 | X | 0.093 |
| Duplicate of J1V4N1 | J1V4N3 | 2/26/15 | 13.4 | | 0.219 | 5680 | | 1.5 | 5.0 | | 0.62 | 42.5 | | 0.072 | 0.14 | B | 0.031 | 0.15 | B | 0.039 | 5350 | | 13.3 | 9.9 | X | 0.055 | 5.7 | X | 0.095 |

**Analysis:**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TDL | | | 0.5 | | | 5 | | | 10 | | | 2 | | | 0.5 | | | 0.2 | | | 100 | | | 1 | | | 2 | | |
| Duplicate Analysis | Both > PQL? | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | |
| | Both >5xTDL? | | Yes (calc RPD) | | | Yes (calc RPD) | | | No-Stop (acceptable) | | | Yes (calc RPD) | | | No-Stop (acceptable) | | | No-Stop (acceptable) | | | Yes (calc RPD) | | | Yes (calc RPD) | | | No-Stop (acceptable) | | |
| | RPD | | 10.6% | | | 4.8% | | | | | | 3.2% | | | | | | | | | 0.6% | | | 9.6% | | | | | |
| | Difference > 2 TDL? | | Not applicable | | | Not applicable | | | No - acceptable | | | Not applicable | | | No - acceptable | | | No - acceptable | | | Not applicable | | | Not applicable | | | No - acceptable | | |

**Duplicate Analysis - 100-H-28:2 and 100-H-42 Waste Sites OVB**

| Sampling Area | HEIS Number | Sample Date | Copper | | | Hexavalent Chromium | | | Iron | | | Lead | | | Magnesium | | | Manganese | | | Nickel | | | Potassium | | | Silicon | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 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 | mg/kg | Q | PQL |
| OVB-9 | J1V4N1 | 2/26/15 | 12.7 | | 0.2 | 0.314 | | 0.155 | 14800 | | 3.5 | 13.5 | X | 0.25 | 4320 | X | 3.5 | 248 | X | 0.093 | 10.6 | X | 0.11 | 784 | | 38.3 | 218 | N | 5.3 |
| Duplicate of J1V4N1 | J1V4N3 | 2/26/15 | 13.2 | | 0.21 | 0.295 | | 0.155 | 14000 | | 3.6 | 13.5 | X | 0.26 | 3960 | X | 3.5 | 230 | X | 0.095 | 9.5 | X | 0.12 | 732 | | 38.8 | 263 | N | 5.4 |

**Analysis:**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TDL | | | 1 | | | 0.5 | | | 5 | | | 5 | | | 75 | | | 5 | | | 4 | | | 400 | | | 2 | | |
| Duplicate Analysis | Both > PQL? | | 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) | | | Yes (calc RPD) | | | Yes (calc RPD) | | | No-Stop (acceptable) | | | No-Stop (acceptable) | | | Yes (calc RPD) | | |
| | RPD | | 3.9% | | | | | | 5.6% | | | | | | 8.7% | | | 7.5% | | | | | | | | | 18.7% | | |
| | Difference > 2 TDL? | | Not applicable | | | No - acceptable | | | Not applicable | | | No - acceptable | | | Not applicable | | | Not applicable | | | No - acceptable | | | No - acceptable | | | Not applicable | | |

**Duplicate Analysis - 100-H-28:2 and 100-H-42 Waste Sites OVB**

| Sampling Area | HEIS Number | Sample Date | Sodium | | | Vanadium | | | Zinc | | | Chloride | | | Fluoride | | | Nitrogen in Nitrate | | | Nitrogen in Nitrite and Nitrate | | | Sulfate | | | TPH - Diesel EXT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 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 | ug/kg | Q | PQL |
| OVB-9 | J1V4N1 | 2/26/15 | 197 | | 55.1 | 41.2 | | 0.088 | 32.6 | X | 0.37 | 8.6 | C | 2.0 | 1.1 | B | 0.84 | 1.6 | BJ | 0.32 | 0.54 | B | 0.37 | 9.8 | | 1.7 | 4000 | J | 1000 |
| Duplicate of J1V4N1 | J1V4N3 | 2/26/15 | 192 | | 55.8 | 39.6 | | 0.089 | 30.5 | X | 0.38 | 8.6 | C | 2.0 | 1.1 | B | 0.82 | 1.5 | BJ | 0.32 | 0.50 | B | 0.37 | 10.0 | | 1.7 | 4400 | | 970 |

**Analysis:**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TDL | | | 50 | | | 2.5 | | | 1 | | | 2 | | | 5 | | | 0.75 | | | 0.75 | | | 5 | | | 5000 | | |
| 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) | | | No-Stop (acceptable) | | | No-Stop (acceptable) | | | No-Stop (acceptable) | | | No-Stop (acceptable) | | |
| | RPD | | | | | 4.0% | | | 6.7% | | | | | | | | | | | | | | | | | | | | |
| | Difference > 2 TDL? | | No - acceptable | | | Not applicable | | | Not applicable | | | No - acceptable | | | No - acceptable | | | No - acceptable | | | No - acceptable | | | No - acceptable | | | No - acceptable | | |

**Duplicate Analysis - 100-H-28:2 and 100-H-42 Waste Sites OVB**

| Sampling Area | Sample Number | Sample Date | TPH - Diesel | | | Benzo(a)anthracene (Method 8310) | | | Benzo(a)pyrene (Method 8310) | | | Benzo(b)fluoranthene (Method 8310) | | | Chrysene (Method 8310) | | | Fluoranthene (Method 8310) | | | DDT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| OVB-9 | J1V4N1 | 2/26/15 | 2400 | J | 700 | 9.4 | JX | 3.3 | 8.6 | J | 6.6 | 8.0 | J | 4.3 | 8.7 | J | 5.0 | 17 | J | 13 | 1.0 | J | 0.24 |
| Duplicate of J1V4N1 | J1V4N3 | 2/26/15 | 2800 | J | 660 | 10 | J | 3.2 | 8.1 | J | 6.5 | 8.8 | J | 4.3 | 8.9 | J | 4.9 | 20 | J | 13 | 0.81 | J | 0.24 |

**Analysis:**

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TDL | | | 5000 | | | 15 | | | 15 | | | 15 | | | 15 | | | 15 | | | 5 | | |
| Duplicate Analysis | Both > PQL? | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | | Yes (continue) | | |
| | Both >5xTDL? | | No-Stop (acceptable) | | | No-Stop (acceptable) | | | No-Stop (acceptable) | | | No-Stop (acceptable) | | | No-Stop (acceptable) | | | No-Stop (acceptable) | | | No-Stop (acceptable) | | |
| | RPD | | | | | | | | | | | | | | | | | | | | | | |
| | Difference > 2 TDL? | | No - acceptable | | | No - acceptable | | | No - acceptable | | | No - acceptable | | | No - acceptable | | | No - acceptable | | | No - acceptable | | |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Radionuclides).**

| Sample Location | HEIS Number | Sample Date | Americium-241 | | | Barium-133 | | | Carbon-14 | | | Cesium-137 | | | Cobalt-60 | | | Europium-152 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA |
| EXC1-4 | J1V272 | 12/15/14 | -0.00801 | U | 0.0461 | -0.00282 | U | 0.0289 | 0.0271 | UJ | 0.318 | -0.00493 | U | 0.0289 | -0.00310 | U | 0.0272 | -0.0525 | U | 0.0652 |
| Duplicate of J1V272 | J1V285 | 12/15/14 | -0.0132 | U | 0.0343 | 0.00998 | U | 0.0235 | 0.0587 | UJ | 0.318 | 0.0220 | U | 0.0248 | -0.000627 | U | 0.0277 | 0.0149 | U | 0.0542 |
| EXC1-1 [a] | J1V543 | 3/16/15 | 0.00482 | U | 0.0280 | -0.00535 | U | 0.0186 | 0.0950 | U | 0.337 | -0.00114 | U | 0.0219 | 0.00427 | U | 0.0248 | -0.00809 | U | 0.0477 |
| EXC1-2 | J1V270 | 12/15/14 | -0.100 | U | 0.137 | 0.109 | U | 0.0432 | 0.0286 | UJ | 0.319 | 0.0398 | U | 0.0338 | 0.00972 | U | 0.0290 | 0.0275 | U | 0.0839 |
| EXC1-3 | J1V271 | 12/15/14 | -0.0697 | U | 0.158 | 0.0124 | U | 0.0260 | 0.000767 | UJ | 0.321 | -0.0187 | U | 0.0205 | -0.00851 | U | 0.0261 | -0.0124 | U | 0.0585 |
| EXC1-5 | J1V273 | 12/15/14 | -0.00736 | U | 0.0262 | -0.000502 | U | 0.0179 | -0.0192 | UJ | 0.318 | 0.00171 | U | 0.0203 | -0.00270 | U | 0.0257 | -0.00127 | U | 0.0421 |
| EXC1-6 | J1V274 | 12/15/14 | -0.00554 | U | 0.0223 | 0.000509 | U | 0.0174 | 0.0580 | UJ | 0.320 | -0.00462 | U | 0.0177 | -0.00755 | U | 0.0204 | 0.00236 | U | 0.0399 |
| EXC1-7 | J1V275 | 12/15/14 | 0.0113 | U | 0.0275 | -0.00413 | U | 0.0181 | -0.00125 | UJ | 0.320 | -0.0110 | U | 0.0182 | -0.000512 | U | 0.0229 | 0.00271 | U | 0.0425 |
| EXC1-8 | J1V276 | 12/15/14 | 0.00119 | U | 0.0372 | 0.0000361 | U | 0.0243 | -0.0177 | UJ | 0.318 | 0.00994 | U | 0.0295 | -0.00813 | U | 0.0281 | -0.0134 | U | 0.0566 |
| EXC1-9 | J1V277 | 12/15/14 | -0.0197 | U | 0.136 | 0.0836 | U | 0.0422 | 0.0101 | UJ | 0.310 | -0.00016 | U | 0.0269 | 0.0111 | U | 0.0316 | 0.0124 | U | 0.0765 |
| EXC1-10 | J1V278 | 12/15/14 | -0.0276 | U | 0.175 | 0.0117 | U | 0.0279 | 0.0245 | UJ | 0.312 | -0.00562 | U | 0.0249 | -0.00612 | U | 0.0273 | -0.0127 | U | 0.0601 |
| EXC1-11 | J1V279 | 12/15/14 | -0.0118 | U | 0.0371 | -0.00160 | U | 0.0242 | -0.0295 | UJ | 0.309 | -0.00655 | U | 0.0230 | -0.00248 | U | 0.0266 | -0.0155 | U | 0.0562 |
| EXC1-12 | J1V280 | 12/15/14 | -0.00199 | U | 0.0264 | 0.0102 | U | 0.0199 | 0.119 | UJ | 0.314 | 0.00571 | U | 0.0215 | 0.00565 | U | 0.0249 | 0.0120 | U | 0.0461 |
| EXC2-7 | J1V292 | 12/12/14 | -0.0105 | U | 0.0274 | -0.0108 | U | 0.0189 | 0.105 | U | 0.322 | 0.00330 | U | 0.0216 | -0.0219 | U | 0.0188 | -0.0193 | U | 0.0442 |
| Duplicate of J1V292 | J1V298 | 12/12/14 | 0.00754 | U | 0.0229 | -0.000162 | U | 0.0164 | -0.0175 | U | 0.320 | -0.00513 | U | 0.0184 | -0.00109 | U | 0.0228 | 0.0533 | | 0.0378 |
| EXC2-1 | J1V286 | 12/12/14 | 0.00752 | U | 0.104 | -0.00431 | U | 0.0370 | -0.0618 | U | 0.319 | -0.00686 | U | 0.0318 | 0.00799 | U | 0.0374 | -0.0504 | U | 0.0781 |
| EXC2-2 | J1V287 | 12/12/14 | 0.0182 | U | 0.141 | 0.0878 | U | 0.0436 | -0.154 | U | 0.320 | 0.00604 | U | 0.0290 | 0.0101 | U | 0.0311 | 0.0709 | U | 0.082 |
| EXC2-3 | J1V288 | 12/12/14 | 0.0145 | U | 0.0435 | 0.0161 | U | 0.0272 | 0.100 | U | 0.318 | 0.00416 | U | 0.0272 | 0.000219 | U | 0.0262 | 0.00847 | U | 0.0644 |
| EXC2-4 | J1V289 | 12/12/14 | -0.00432 | U | 0.0246 | 0.000433 | U | 0.0173 | -0.0156 | U | 0.322 | -0.0132 | U | 0.0184 | 0.000956 | U | 0.0249 | 0.00132 | U | 0.0447 |
| EXC2-5 | J1V290 | 12/12/14 | 0.00677 | U | 0.0222 | 0.00123 | U | 0.0176 | 0.0273 | U | 0.320 | -0.0107 | U | 0.0178 | 0.00479 | U | 0.0235 | -0.000905 | U | 0.0376 |
| EXC2-6 | J1V291 | 12/12/14 | 0.00198 | U | 0.0252 | 0.00711 | U | 0.0190 | 0.110 | U | 0.318 | -0.0104 | U | 0.020 | 0.00777 | U | 0.0238 | 0.0160 | U | 0.0454 |
| EXC2-8 | J1V293 | 12/12/14 | -0.0536 | U | 0.109 | 0.00497 | U | 0.0373 | -0.104 | U | 0.323 | 0.00404 | U | 0.0356 | -0.00190 | U | 0.0386 | -0.0578 | U | 0.0869 |
| EXC2-9 | J1V294 | 12/12/14 | -0.0654 | U | 0.139 | 0.0754 | U | 0.0416 | 0.0637 | U | 0.323 | 0.00103 | U | 0.0275 | -0.00607 | U | 0.0259 | -0.0478 | U | 0.0775 |
| EXC2-10 | J1V295 | 12/12/14 | -0.0347 | U | 0.149 | -0.00517 | U | 0.0222 | -0.164 | U | 0.318 | -0.000211 | U | 0.0244 | 0.0061 | U | 0.0253 | 0.00996 | U | 0.0543 |
| EXC2-11 | J1V296 | 12/12/14 | 0.00369 | U | 0.0376 | 0.000198 | U | 0.0236 | -0.101 | U | 0.321 | -0.00777 | U | 0.0218 | -0.00258 | U | 0.0232 | 0.0146 | U | 0.0591 |
| EXC2-12 | J1V297 | 12/12/14 | 0.0109 | U | 0.0285 | 0.00279 | U | 0.0199 | -0.0648 | U | 0.322 | 0.0315 | | 0.0232 | -0.0122 | U | 0.0249 | -0.00443 | U | 0.0448 |
| EXC1-1 | J1V269 | 12/15/14 | -0.00194 | U | 0.112 | 0.00511 | U | 0.0377 | 0.103 | U | 0.318 | -0.00759 | U | 0.0351 | 0.00404 | U | 0.0374 | 0.0035 | U | 0.0871 |

[a] These sample locations were re-sampled due to exceedances at one or more location.
Sample data for the original sample locations (J1V269, J1V263, J1V267, and J1V266) are for information only.
Acronyms and notes apply to all of the tables in this attachment.
Note: Data qualified with B, C, D, J, M, N, and/or P are considered acceptable values.

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 1 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

* = MS/MSD RPD exceeded the control limit.
B = blank contamination (inorganic constituents)
C = the analyte was detected in both the sample and the associated QC blank, and the sample concentration was ≤5x the blank concentration.
D = diluted
EXC1 = excavation 1
EXC2 = excavation 2
FS = focused sample
HEIS = Hanford Environmental Information System
J = estimate
M = sample duplicate precision not met.
MDA = minimum dection allowed
N = recovery exceeds upper or lower control limits
OVB = overburden
P = aroclor target analyte with greater than 25% difference between column analyses.
PQL = practical quantitation limit
Q = qualifier
R = rejected
RC = road crossing
SPA = staging pile area
U = undetected
X (metals) = serial dilution in the analytical batch indicates physical and chemical interferences are present.
X (organics) = more than 40% difference between columns, lower result reported

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Radionuclides).**

| Sample Location | HEIS Number | Sample Date | Europium-154 | | | Europium-155 | | | Nickel-63 | | | Potassium-40 | | | Silver-108m | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA |
| EXC1-4 | J1V272 | 12/15/14 | 0.0210 | U | 0.0919 | 0.0536 | U | 0.0711 | 1.40 | U | 6.24 | 16.7 | | 0.268 | -0.00732 | U | 0.0204 |
| Duplicate of J1V272 | J1V285 | 12/15/14 | 0.0188 | U | 0.0927 | 0.0650 | U | 0.0514 | 1.09 | U | 5.87 | 16.8 | | 0.251 | -0.00821 | U | 0.0176 |
| EXC1-1 [a] | J1V543 | 3/16/15 | 0.0167 | U | 0.0801 | 0.0277 | U | 0.0414 | 4.57 | U | 7.35 | 13.1 | | 0.245 | -0.00124 | U | 0.0149 |
| EXC1-2 | J1V270 | 12/15/14 | 0.0242 | U | 0.0952 | 0.00986 | U | 0.0973 | 2.99 | U | 6.11 | 13.2 | | 0.193 | -0.00150 | U | 0.0235 |
| EXC1-3 | J1V271 | 12/15/14 | 0.0292 | U | 0.088 | 0.0363 | U | 0.0675 | 1.09 | U | 6.13 | 13.9 | | 0.224 | -0.00718 | U | 0.0175 |
| EXC1-5 | J1V273 | 12/15/14 | -0.0193 | U | 0.0715 | 0.0407 | U | 0.0391 | -0.979 | U | 6.06 | 14.0 | | 0.231 | 0.00460 | U | 0.0146 |
| EXC1-6 | J1V274 | 12/15/14 | -0.0333 | U | 0.0706 | 0.0277 | U | 0.0341 | 1.92 | U | 6.07 | 12.1 | | 0.186 | -0.00490 | U | 0.0128 |
| EXC1-7 | J1V275 | 12/15/14 | -0.0199 | U | 0.0744 | 0.0280 | U | 0.0409 | 0.926 | U | 6.13 | 13.2 | | 0.203 | -0.00879 | U | 0.0134 |
| EXC1-8 | J1V276 | 12/15/14 | -0.00335 | U | 0.0940 | 0.0370 | U | 0.0541 | 3.62 | U | 6.27 | 15.8 | | 0.207 | -0.00654 | U | 0.0186 |
| EXC1-9 | J1V277 | 12/15/14 | 0.00104 | U | 0.0917 | -0.0453 | U | 0.0950 | 2.59 | U | 6.20 | 13.7 | | 0.231 | -0.00713 | U | 0.0223 |
| EXC1-10 | J1V278 | 12/15/14 | 0.0413 | U | 0.0888 | 0.0422 | U | 0.0763 | 1.54 | U | 6.05 | 14.0 | | 0.217 | 0.0141 | U | 0.0208 |
| EXC1-11 | J1V279 | 12/15/14 | -0.00901 | U | 0.0828 | 0.0327 | U | 0.0569 | 0.185 | U | 6.09 | 12.4 | | 0.177 | -0.0205 | U | 0.0165 |
| EXC1-12 | J1V280 | 12/15/14 | -0.0245 | U | 0.0776 | 0.00833 | U | 0.0383 | 3.50 | U | 6.12 | 14.4 | | 0.232 | 0.00413 | U | 0.0151 |
| EXC2-7 | J1V292 | 12/12/14 | -0.0146 | U | 0.0671 | 0.00611 | U | 0.0420 | 1.24 | U | 6.48 | 12.5 | | 0.201 | 0.00348 | U | 0.0148 |
| Duplicate of J1V292 | J1V298 | 12/12/14 | 0.0186 | U | 0.0749 | 0.0113 | U | 0.0342 | 3.22 | U | 6.39 | 11.8 | | 0.199 | 0.00308 | U | 0.0139 |
| EXC2-1 | J1V286 | 12/12/14 | 0.00984 | U | 0.123 | 0.0216 | U | 0.0833 | 2.91 | U | 6.74 | 14.3 | | 0.262 | 0.00380 | U | 0.0262 |
| EXC2-2 | J1V287 | 12/12/14 | 0.00134 | U | 0.0933 | -0.0274 | U | 0.0934 | 2.14 | U | 7.04 | 15.9 | | 0.230 | 0.00268 | U | 0.0240 |
| EXC2-3 | J1V288 | 12/12/14 | -0.0122 | U | 0.0838 | 0.0461 | U | 0.0647 | 4.46 | U | 6.68 | 13.9 | | 0.188 | -0.00739 | U | 0.0187 |
| EXC2-4 | J1V289 | 12/12/14 | -0.0251 | U | 0.0750 | 0.0205 | U | 0.0381 | 2.30 | U | 6.89 | 10.6 | | 0.224 | -0.000711 | U | 0.0133 |
| EXC2-5 | J1V290 | 12/12/14 | 0.00807 | U | 0.0753 | 0.0112 | U | 0.0345 | 0.622 | U | 7.03 | 14.6 | | 0.196 | 0.000932 | U | 0.0134 |
| EXC2-6 | J1V291 | 12/12/14 | 0.000552 | U | 0.0727 | 0.0398 | U | 0.0402 | 3.08 | U | 6.77 | 13.1 | | 0.170 | 0.00618 | U | 0.0142 |
| EXC2-8 | J1V293 | 12/12/14 | 0.000976 | U | 0.123 | 0.0265 | U | 0.0891 | 2.40 | U | 6.71 | 14.8 | | 0.283 | -0.00968 | U | 0.0285 |
| EXC2-9 | J1V294 | 12/12/14 | -0.00256 | U | 0.0875 | 0.0192 | U | 0.100 | 1.72 | U | 6.22 | 14.3 | | 0.193 | -0.00504 | U | 0.0236 |
| EXC2-10 | J1V295 | 12/12/14 | -0.0149 | U | 0.0730 | 0.000469 | U | 0.0588 | 2.68 | U | 6.51 | 9.86 | | 0.204 | 0.00372 | U | 0.0171 |
| EXC2-11 | J1V296 | 12/12/14 | -0.0104 | U | 0.0666 | 0.0104 | U | 0.0553 | 0.351 | U | 6.28 | 11.4 | | 0.179 | 0.00185 | U | 0.0176 |
| EXC2-12 | J1V297 | 12/12/14 | -0.0203 | U | 0.0766 | 0.0340 | U | 0.0388 | 0.584 | U | 6.74 | 13.4 | | 0.231 | -0.00468 | U | 0.0147 |
| EXC1-1 | J1V269 | 12/15/14 | -0.00365 | U | 0.124 | 0.0647 | U | 0.0899 | 4.46 | U | 6.29 | 14.2 | | 0.274 | -0.000157 | U | 0.0271 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 2 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Radionuclides).**

| Sample Location | HEIS Number | Sample Date | Americium-241 | | | Barium-133 | | | Carbon-14 | | | Cesium-137 | | | Cobalt-60 | | | Europium-152 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA |
| SPA-1 | J1V4L5 | 2/26/15 | -0.0596 | U | 0.148 | | | | -0.0493 | U | 0.323 | -0.000324 | U | 0.0306 | 0.00470 | U | 0.0299 | 0.0465 | U | 0.0833 |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 0.0121 | U | 0.0327 | | | | 0.0652 | U | 0.327 | -0.0148 | U | 0.0215 | -0.0134 | U | 0.0240 | 0.0104 | U | 0.0513 |
| SPA-2 | J1V4L6 | 2/26/15 | 0.0263 | U | 0.111 | | | | 0.459 | | 0.322 | 0.0443 | U | 0.0420 | 0.0125 | U | 0.0378 | -0.0535 | U | 0.0796 |
| SPA-3 | J1V4L7 | 2/26/15 | -0.0231 | U | 0.159 | | | | 0.0384 | U | 0.329 | 0.00527 | U | 0.0237 | -0.000862 | U | 0.0247 | -0.0269 | U | 0.0552 |
| SPA-4 | J1V4L8 | 2/26/15 | -0.00107 | U | 0.028 | | | | 0.0550 | U | 0.327 | -0.000219 | U | 0.0222 | 0.00460 | U | 0.0248 | 0.00699 | U | 0.0454 |
| SPA-5 | J1V4L9 | 2/26/15 | -0.00571 | U | 0.0256 | | | | -0.157 | U | 0.327 | 0.0142 | U | 0.0238 | -0.0153 | U | 0.0212 | 0.0080 | U | 0.0475 |
| SPA-6 | J1V4M0 | 2/26/15 | -0.00113 | U | 0.0302 | | | | -0.0138 | U | 0.328 | -0.00240 | U | 0.0208 | 0.00529 | U | 0.0271 | 0.00768 | U | 0.0488 |
| SPA-7 | J1V4M1 | 2/26/15 | -0.0246 | U | 0.138 | | | | 0.0659 | U | 0.328 | 0.0510 | U | 0.0344 | 0.00131 | U | 0.0263 | 0.140 | U | 0.0797 |
| SPA-8 | J1V4M2 | 2/26/15 | 0.0478 | U | 0.132 | | | | 0.0757 | U | 0.329 | -0.00751 | U | 0.0368 | -0.00398 | U | 0.0370 | 0.0128 | U | 0.0958 |
| SPA-9 | J1V4M3 | 2/26/15 | 0.00709 | U | 0.0242 | | | | 0.0593 | U | 0.328 | 0.0709 | | 0.0189 | -0.00899 | U | 0.0195 | 0.0116 | U | 0.0414 |
| SPA-10 | J1V4M4 | 2/26/15 | -0.0880 | U | 0.142 | | | | -0.00109 | U | 0.328 | 0.0278 | U | 0.0272 | 0.00296 | U | 0.0251 | 0.0289 | U | 0.0567 |
| SPA-11 | J1V4M5 | 4/2/15 | 0.0182 | U | 0.0252 | | | | -0.0411 | U | 0.332 | -0.00972 | U | 0.0158 | -0.00697 | U | 0.0189 | -0.0127 | U | 0.0395 |
| SPA-12 | J1V4M6 | 4/2/15 | -0.00717 | U | 0.0323 | | | | -0.176 | U | 0.332 | -0.00183 | U | 0.0220 | -0.00581 | U | 0.0213 | -0.0289 | U | 0.0505 |
| SPA-13 | J1V4M7 | 2/26/15 | 0.00738 | U | 0.0326 | | | | 0.0956 | U | 0.319 | 0.382 | | 0.0259 | 0.00655 | U | 0.0268 | 0.261 | | 0.0562 |
| SPA-14 | J1V4M8 | 2/26/15 | 0.0143 | U | 0.176 | | | | 0.122 | U | 0.327 | 0.0637 | | 0.0253 | -0.00277 | U | 0.0269 | 0.0315 | U | 0.0694 |
| SPA-15 | J1V4M9 | 4/2/15 | 0.0138 | U | 0.133 | | | | -0.268 | U | 0.332 | 0.0149 | U | 0.0447 | 0.00870 | U | 0.0436 | -0.0717 | U | 0.0895 |
| OVB-9[a] | J1V4N1 | 2/26/15 | 0.0328 | U | 0.111 | | | | -0.289 | U | 0.366 | -0.00980 | U | 0.0318 | 0.0160 | U | 0.0357 | -0.0438 | U | 0.0795 |
| Duplicate of J1V4N1[a] | J1V4N3 | 2/26/15 | 0.0228 | U | 0.161 | | | | -0.266 | U | 0.366 | 0.0110 | U | 0.0259 | -0.00436 | U | 0.0263 | 0.0127 | U | 0.0604 |
| OVB-1 | J1V255 | 12/10/14 | -0.0192 | U | 0.136 | -0.00799 | U | 0.0623 | 0.00496 | U | 0.335 | 0.000863 | U | 0.0602 | 0.0184 | U | 0.0735 | 0.0127 | U | 0.139 |
| OVB-2 | J1V256 | 12/10/14 | -0.0310 | U | 0.154 | 0.0704 | U | 0.0656 | -0.0411 | U | 0.336 | -0.0197 | U | 0.0481 | -0.00550 | U | 0.0530 | -0.265 | U | 0.131 |
| OVB-3 | J1V257 | 12/10/14 | 0.0859 | U | 0.214 | 0.00113 | U | 0.0464 | -0.158 | U | 0.335 | -0.0442 | U | 0.0425 | -0.0317 | U | 0.0487 | 0.0314 | U | 0.106 |
| OVB-4 | J1V258 | 12/10/14 | -0.00803 | U | 0.0271 | 0.00746 | U | 0.0309 | -0.137 | U | 0.331 | -0.0062 | U | 0.0343 | 0.00918 | U | 0.0499 | 0.00824 | U | 0.0705 |
| OVB-5 | J1V259 | 12/10/14 | 0.00468 | U | 0.0302 | 0.000604 | U | 0.0304 | -0.0686 | U | 0.338 | -0.00102 | U | 0.0330 | 0.000636 | U | 0.0422 | -0.0227 | U | 0.0681 |
| OVB-6 | J1V260 | 12/10/14 | 0.00217 | U | 0.0314 | -0.0138 | U | 0.0319 | -0.127 | U | 0.338 | -0.00233 | U | 0.0361 | -0.000168 | U | 0.0433 | -0.0463 | U | 0.0768 |
| OVB-7 | J1V261 | 12/10/14 | -0.0289 | U | 0.133 | -0.00405 | U | 0.0561 | -0.0306 | U | 0.336 | -0.00243 | U | 0.0506 | 0.00392 | U | 0.0611 | -0.0557 | U | 0.126 |
| OVB-8 | J1V262 | 12/10/14 | -0.0109 | U | 0.146 | 0.0000604 | U | 0.0633 | -0.00994 | U | 0.332 | -0.0680 | U | 0.0483 | 0.00484 | U | 0.0725 | 0.0175 | U | 0.139 |
| OVB-10 | J1V264 | 12/10/14 | -0.0203 | U | 0.213 | -0.0162 | U | 0.0459 | -0.220 | U | 0.333 | -0.0240 | U | 0.0481 | -0.000867 | U | 0.0575 | 0.0182 | U | 0.110 |
| OVB-11 | J1V265 | 12/10/14 | -0.00204 | U | 0.0272 | 0.0024 | U | 0.0303 | -0.137 | U | 0.334 | -0.0161 | U | 0.0339 | 0.0114 | U | 0.0492 | -0.00713 | U | 0.0688 |
| OVB-12[a] | J1V4N2 | 2/26/15 | 0.0161 | U | 0.0266 | | | | -0.211 | U | 0.365 | 0.0141 | U | 0.0222 | 0.00345 | U | 0.0240 | 0.0158 | U | 0.0447 |
| FS-1 | J1V281 | 12/15/14 | -0.0201 | U | 0.0294 | 0.013 | U | 0.0237 | 0.125 | UJ | 0.316 | -0.0107 | U | 0.0237 | -0.00966 | U | 0.0244 | 0.0274 | U | 0.0557 |
| FS-2 | J1V282 | 12/15/14 | -0.00595 | U | 0.0282 | 0.00973 | U | 0.0201 | -0.00587 | UJ | 0.318 | 0.0107 | U | 0.0226 | 0.00423 | U | 0.0230 | 0.0123 | U | 0.0470 |
| FS-3 | J1V283 | 12/15/14 | -0.0115 | U | 0.0375 | 0.000608 | U | 0.0259 | 0.0181 | UJ | 0.318 | 0.00617 | U | 0.0285 | -0.00372 | U | 0.0313 | -0.0167 | U | 0.0583 |
| FS-4 | J1V284 | 12/15/14 | 0.00704 | U | 0.0269 | 0.0085 | U | 0.0178 | 0.121 | UJ | 0.317 | -0.00439 | U | 0.0197 | 0.00785 | U | 0.0258 | -0.0130 | U | 0.0431 |
| OVB-9 | J1V263 | 12/10/14 | 0.0302 | U | 0.159 | 0.115 | U | 0.0694 | -0.0817 | U | 0.337 | 0.0170 | U | 0.0522 | -0.0263 | U | 0.0497 | -0.320 | U | 0.123 |
| Duplicate of J1V263 | J1V267 | 12/10/14 | 0.00992 | U | 0.032 | -0.013 | U | 0.0349 | -0.331 | U | 0.331 | 0.00911 | U | 0.0379 | -0.0147 | U | 0.0413 | 0.0203 | U | 0.0829 |
| OVB-12 | J1V266 | 12/10/14 | 0.00348 | U | 0.0327 | -0.00886 | U | 0.0327 | -0.214 | U | 0.332 | -0.00428 | U | 0.0365 | 0.0141 | U | 0.0450 | 0.00253 | U | 0.0758 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 3 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Radionuclides).**

| Sample Location | HEIS Number | Sample Date | Europium-154 | | | Europium-155 | | | Nickel-63 | | | Potassium-40 | | | Silver-108m | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA | pCi/g | Q | MDA |
| SPA-1 | J1V4L5 | 2/26/15 | 0.0194 | U | 0.0955 | -0.00238 | U | 0.106 | -2.17 | U | 6.22 | 16.0 | | 0.218 | | | |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 0.0110 | U | 0.0823 | 0.0590 | U | 0.0506 | -2.21 | U | 6.60 | 14.9 | | 0.180 | | | |
| SPA-2 | J1V4L6 | 2/26/15 | -0.0511 | U | 0.100 | -0.00989 | U | 0.0819 | 0.0346 | U | 6.36 | 14.2 | | 0.293 | | | |
| SPA-3 | J1V4L7 | 2/26/15 | -0.0105 | U | 0.0781 | 0.0360 | U | 0.0663 | -1.67 | U | 6.60 | 13.2 | | 0.175 | | | |
| SPA-4 | J1V4L8 | 2/26/15 | -0.0343 | U | 0.0770 | 0.0264 | U | 0.0382 | -0.928 | U | 6.20 | 13.6 | | 0.221 | | | |
| SPA-5 | J1V4L9 | 2/26/15 | 0.0704 | U | 0.0903 | 0.0358 | U | 0.0400 | -0.236 | U | 6.58 | 14.1 | | 0.189 | | | |
| SPA-6 | J1V4M0 | 2/26/15 | 0.00774 | U | 0.0794 | 0.0314 | U | 0.0467 | -0.943 | U | 6.17 | 13.7 | | 0.177 | | | |
| SPA-7 | J1V4M1 | 2/26/15 | -0.0109 | U | 0.0939 | -0.0252 | U | 0.0992 | -1.62 | U | 6.46 | 14.0 | | 0.191 | | | |
| SPA-8 | J1V4M2 | 2/26/15 | -0.0130 | U | 0.127 | 0.0221 | U | 0.0969 | -1.58 | U | 6.88 | 14.8 | | 0.296 | | | |
| SPA-9 | J1V4M3 | 2/26/15 | -0.0328 | U | 0.0687 | 0.0441 | U | 0.0382 | -1.97 | U | 6.32 | 13.1 | | 0.152 | | | |
| SPA-10 | J1V4M4 | 2/26/15 | 0.0161 | U | 0.0814 | 0.0164 | U | 0.0637 | -2.08 | U | 6.36 | 13.5 | | 0.187 | | | |
| SPA-11 | J1V4M5 | 4/2/15 | 0.0103 | U | 0.0672 | 0.0116 | U | 0.0380 | 3.72 | U | 5.70 | 10.4 | | 0.151 | | | |
| SPA-12 | J1V4M6 | 4/2/15 | -0.0509 | U | 0.0753 | 0.0510 | U | 0.0500 | 2.85 | U | 5.49 | 14.1 | | 0.190 | | | |
| SPA-13 | J1V4M7 | 2/26/15 | 0.0358 | U | 0.0901 | 0.0881 | | 0.0457 | -1.00 | U | 6.49 | 14.6 | | 0.197 | | | |
| SPA-14 | J1V4M8 | 2/26/15 | -0.0242 | U | 0.0810 | 0.0225 | U | 0.0736 | -0.843 | U | 6.55 | 13.9 | | 0.232 | | | |
| SPA-15 | J1V4M9 | 4/2/15 | 0.0459 | U | 0.144 | -0.00229 | U | 0.0949 | 1.19 | U | 5.47 | 14.8 | | 0.322 | | | |
| OVB-9[a] | J1V4N1 | 2/26/15 | -0.0687 | U | 0.0996 | 0.00882 | U | 0.0856 | -0.895 | U | 6.26 | 14.9 | | 0.289 | | | |
| Duplicate of J1V4N1[a] | J1V4N3 | 2/26/15 | 0.0405 | U | 0.0847 | 0.0593 | U | 0.0659 | -2.59 | U | 6.32 | 13.4 | | 0.219 | | | |
| OVB-1 | J1V255 | 12/10/14 | -0.00672 | U | 0.222 | 0.00729 | U | 0.118 | 2.10 | U | 6.18 | 8.11 | | 0.610 | 0.000188 | U | 0.0477 |
| OVB-2 | J1V256 | 12/10/14 | -0.0173 | U | 0.158 | -0.0328 | U | 0.114 | 1.28 | U | 6.81 | 6.21 | | 0.553 | 0.00661 | U | 0.0436 |
| OVB-3 | J1V257 | 12/10/14 | 0.0115 | U | 0.161 | 0.0112 | U | 0.0953 | 2.30 | U | 7.42 | 8.32 | | 0.344 | 0.00921 | U | 0.0343 |
| OVB-4 | J1V258 | 12/10/14 | -0.0498 | U | 0.133 | 0.0370 | U | 0.0523 | 0.312 | U | 6.63 | 10.5 | | 0.367 | -0.0103 | U | 0.0211 |
| OVB-5 | J1V259 | 12/10/14 | 0.0220 | U | 0.137 | 0.0274 | U | 0.0543 | -0.259 | U | 6.29 | 9.27 | | 0.322 | 0.00314 | U | 0.0252 |
| OVB-6 | J1V260 | 12/10/14 | 0.00152 | U | 0.127 | 0.0203 | U | 0.0577 | -0.404 | U | 5.98 | 7.75 | | 0.391 | 0.0100 | U | 0.0266 |
| OVB-7 | J1V261 | 12/10/14 | -0.0775 | U | 0.182 | 0.0314 | U | 0.111 | 2.46 | U | 5.73 | 9.13 | | 0.471 | -0.00791 | U | 0.0444 |
| OVB-8 | J1V262 | 12/10/14 | 0.0343 | U | 0.211 | 0.0222 | U | 0.117 | 2.72 | U | 6.66 | 8.92 | | 0.547 | -0.0229 | U | 0.0442 |
| OVB-10 | J1V264 | 12/10/14 | 0.0255 | U | 0.184 | 0.0292 | U | 0.100 | 2.61 | U | 5.73 | 8.77 | | 0.454 | -0.00874 | U | 0.0343 |
| OVB-11 | J1V265 | 12/10/14 | 0.0749 | U | 0.155 | 0.00788 | U | 0.0501 | 2.42 | U | 6.30 | 8.31 | | 0.465 | -0.00989 | U | 0.0221 |
| OVB-12[a] | J1V4N2 | 2/26/15 | -0.0217 | U | 0.0687 | 0.0331 | U | 0.0399 | -1.13 | U | 6.34 | 12.4 | | 0.207 | | | |
| FS-1 | J1V281 | 12/15/14 | 0.0794 | U | 0.102 | 0.0325 | U | 0.0475 | 0.516 | U | 6.32 | 14.6 | | 0.200 | 0.000142 | U | 0.0170 |
| FS-2 | J1V282 | 12/15/14 | -0.0185 | U | 0.0734 | 0.0411 | U | 0.0430 | 8.99 | | 6.10 | 13.0 | | 0.200 | -0.00344 | U | 0.0148 |
| FS-3 | J1V283 | 12/15/14 | 0.0596 | U | 0.101 | 0.0588 | U | 0.0578 | -0.202 | U | 6.13 | 16.4 | | 0.265 | -0.00477 | U | 0.0187 |
| FS-4 | J1V284 | 12/15/14 | 0.0443 | U | 0.0881 | 0.00156 | U | 0.0382 | 1.54 | U | 6.51 | 13.1 | | 0.251 | 0.00538 | U | 0.0157 |
| OVB-9 | J1V263 | 12/10/14 | 0.0291 | U | 0.182 | -0.0735 | U | 0.119 | 1.72 | U | 6.87 | 7.88 | | 0.465 | -0.0104 | U | 0.0384 |
| Duplicate of J1V263 | J1V267 | 12/10/14 | -0.0228 | U | 0.134 | 0.00976 | U | 0.0600 | 0.414 | U | 6.45 | 7.90 | | 0.328 | -0.00130 | U | 0.0266 |
| OVB-12 | J1V266 | 12/10/14 | 0.0299 | U | 0.143 | 0.0145 | U | 0.0548 | -2.62 | U | 6.96 | 10.6 | | 0.502 | 0.0140 | U | 0.0272 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 4 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Metals).**

| Sample Location | HEIS Number | Sample Date | Aluminum | | | Antimony | | | Arsenic | | | Barium | | | Beryllium | | | Boron | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| EXC1-4 | J1V272 | 12/15/14 | 8020 | X | 1.5 | 0.36 | UJ | 0.36 | 4.9 | J | 0.63 | 72.1 | | 0.073 | 0.055 | B | 0.032 | 0.94 | U | 0.94 |
| Duplicate of J1V272 | J1V285 | 12/15/14 | 7510 | X | 1.5 | 0.37 | UJ | 0.37 | 5.2 | J | 0.64 | 66.7 | | 0.074 | 0.040 | B | 0.032 | 0.95 | U | 0.95 |
| EXC1-1[a] | J1V543 | 3/16/15 | 8000 | | 1.4 | 0.51 | B | 0.33 | 5.3 | M | 0.58 | 160 | M | 0.067 | 0.85 | | 0.029 | 25.7 | MN | 0.86 |
| EXC1-2 | J1V270 | 12/15/14 | 5460 | X | 1.6 | 0.38 | UJ | 0.38 | 5.4 | J | 0.67 | 60.4 | | 0.077 | 0.033 | U | 0.033 | 1.2 | B | 0.99 |
| EXC1-3 | J1V271 | 12/15/14 | 3910 | X | 1.5 | 0.38 | UJ | 0.38 | 2.0 | J | 0.66 | 23.7 | | 0.076 | 0.033 | U | 0.033 | 0.98 | U | 0.98 |
| EXC1-5 | J1V273 | 12/15/14 | 4940 | X | 1.5 | 0.36 | UJ | 0.36 | 1.9 | J | 0.62 | 35.5 | | 0.072 | 0.031 | U | 0.031 | 0.93 | U | 0.93 |
| EXC1-6 | J1V274 | 12/15/14 | 4040 | X | 1.6 | 0.38 | UJ | 0.38 | 2.9 | J | 0.66 | 33.4 | | 0.076 | 0.033 | U | 0.033 | 0.98 | U | 0.98 |
| EXC1-7 | J1V275 | 12/15/14 | 4170 | X | 1.5 | 0.37 | UJ | 0.37 | 2.1 | J | 0.64 | 37.7 | | 0.073 | 0.032 | U | 0.032 | 0.95 | U | 0.95 |
| EXC1-8 | J1V276 | 12/15/14 | 9390 | X | 1.5 | 0.36 | UJ | 0.36 | 5.1 | J | 0.62 | 81.4 | | 0.072 | 0.086 | B | 0.031 | 1.1 | B | 0.93 |
| EXC1-9 | J1V277 | 12/15/14 | 3660 | X | 1.5 | 0.36 | UJ | 0.36 | 2.7 | J | 0.62 | 31.9 | | 0.071 | 0.031 | U | 0.031 | 0.92 | U | 0.92 |
| EXC1-10 | J1V278 | 12/15/14 | 6510 | X | 1.5 | 0.37 | UJ | 0.37 | 9.4 | J | 0.65 | 54.0 | | 0.075 | 0.032 | U | 0.032 | 1.0 | B | 0.96 |
| EXC1-11 | J1V279 | 12/15/14 | 4550 | X | 1.6 | 0.38 | UJ | 0.38 | 2.0 | J | 0.67 | 36.1 | | 0.077 | 0.033 | U | 0.033 | 0.99 | U | 0.99 |
| EXC1-12 | J1V280 | 12/15/14 | 7680 | X | 1.5 | 0.39 | BJ | 0.38 | 9.0 | J | 0.65 | 59.2 | | 0.075 | 0.033 | U | 0.033 | 2.0 | | 0.97 |
| EXC2-7 | J1V292 | 12/12/14 | 5720 | | 1.6 | 0.39 | U | 0.39 | 3.4 | | 0.68 | 54.1 | | 0.078 | 0.034 | U | 0.034 | 1.0 | U | 1.0 |
| Duplicate of J1V292 | J1V298 | 12/12/14 | 5700 | | 1.6 | 0.38 | U | 0.38 | 4.0 | | 0.66 | 57.6 | | 0.076 | 0.033 | U | 0.033 | 0.98 | U | 0.98 |
| EXC2-1 | J1V286 | 12/12/14 | 5380 | | 1.5 | 0.38 | U | 0.38 | 1.9 | | 0.66 | 38.1 | | 0.076 | 0.033 | U | 0.033 | 0.98 | U | 0.98 |
| EXC2-2 | J1V287 | 12/12/14 | 5160 | | 1.4 | 0.34 | U | 0.34 | 2.5 | | 0.59 | 65.1 | | 0.068 | 0.029 | U | 0.029 | 0.87 | U | 0.87 |
| EXC2-3 | J1V288 | 12/12/14 | 5410 | | 1.5 | 0.37 | U | 0.37 | 4.2 | | 0.64 | 43.2 | | 0.074 | 0.032 | U | 0.032 | 1.0 | B | 0.95 |
| EXC2-4 | J1V289 | 12/12/14 | 4750 | | 1.5 | 0.37 | U | 0.37 | 1.7 | | 0.65 | 51.5 | | 0.074 | 0.065 | U | 0.065 | 0.96 | U | 0.96 |
| EXC2-5 | J1V290 | 12/12/14 | 7610 | | 1.6 | 0.38 | U | 0.38 | 2.7 | | 0.66 | 46.0 | | 0.077 | 0.033 | U | 0.033 | 0.99 | U | 0.99 |
| EXC2-6 | J1V291 | 12/12/14 | 7200 | | 1.5 | 0.36 | U | 0.36 | 3.1 | | 0.63 | 67.0 | | 0.073 | 0.032 | U | 0.032 | 0.94 | U | 0.94 |
| EXC2-8 | J1V293 | 12/12/14 | 6390 | | 1.6 | 0.39 | U | 0.39 | 2.3 | | 0.69 | 47.8 | | 0.079 | 0.034 | U | 0.034 | 1.0 | U | 1.0 |
| EXC2-9 | J1V294 | 12/12/14 | 5910 | | 1.5 | 0.37 | U | 0.37 | 6.5 | | 0.65 | 43.3 | | 0.075 | 0.032 | U | 0.032 | 0.97 | U | 0.97 |
| EXC2-10 | J1V295 | 12/12/14 | 4550 | | 1.5 | 0.36 | U | 0.36 | 1.2 | | 0.62 | 54.2 | | 0.072 | 0.062 | U | 0.062 | 0.92 | U | 0.92 |
| EXC2-11 | J1V296 | 12/12/14 | 4030 | | 1.4 | 0.34 | U | 0.34 | 2.1 | | 0.58 | 54.2 | | 0.067 | 0.058 | U | 0.058 | 0.87 | U | 0.87 |
| EXC2-12 | J1V297 | 12/12/14 | 4810 | | 1.5 | 0.37 | U | 0.37 | 4.3 | | 0.64 | 41.9 | | 0.073 | 0.032 | U | 0.032 | 0.95 | U | 0.95 |
| EXC1-1 | J1V269 | 12/15/14 | 7810 | X | 1.6 | 0.39 | U | 0.39 | 57.3 | M | 0.67 | 74.2 | | 0.077 | 0.034 | U | 0.034 | 4.1 | | 1.0 |
| Equipment blank 1 | J1V268 | 12/10/14 | 106 | | 1.4 | 0.35 | U | 0.35 | 0.61 | B | 0.61 | 1.3 | | 0.070 | 0.030 | U | 0.030 | 0.90 | U | 0.90 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 5 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Metals).**

| Sample Location | HEIS Number | Sample Date | Cadmium | | | Calcium | | | Chromium | | | Cobalt | | | Copper | | | Hexavalent Chromium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| EXC1-4 | J1V272 | 12/15/14 | 0.12 | B | 0.039 | 3910 | X | 13.5 | 16.2 | | 0.055 | 5.8 | X | 0.096 | 12.3 | | 0.21 | 0.155 | U | 0.155 |
| Duplicate of J1V272 | J1V285 | 12/15/14 | 0.13 | B | 0.040 | 3760 | X | 13.6 | 15.8 | | 0.056 | 5.7 | X | 0.097 | 12.3 | | 0.21 | 0.204 | | 0.155 |
| EXC1-1[a] | J1V543 | 3/16/15 | 0.075 | B | 0.036 | 6350 | X | 13.9 | 10.2 | | 0.051 | 5.7 | X | 0.088 | 16.4 | | 0.21 | 0.155 | U | 0.155 |
| EXC1-2 | J1V270 | 12/15/14 | 0.072 | B | 0.041 | 5420 | X | 14.2 | 9.0 | | 0.058 | 5.6 | X | 0.10 | 11.8 | | 0.22 | 0.266 | | 0.155 |
| EXC1-3 | J1V271 | 12/15/14 | 0.041 | U | 0.041 | 4200 | X | 14.1 | 6.4 | | 0.058 | 3.8 | X | 0.10 | 9.6 | | 0.22 | 0.155 | U | 0.155 |
| EXC1-5 | J1V273 | 12/15/14 | 0.060 | B | 0.039 | 5910 | X | 13.3 | 8.1 | | 0.055 | 4.9 | X | 0.095 | 11.1 | | 0.21 | 0.155 | U | 0.155 |
| EXC1-6 | J1V274 | 12/15/14 | 0.085 | B | 0.041 | 4480 | X | 14.1 | 11.9 | | 0.058 | 5.9 | X | 0.10 | 10.9 | | 0.22 | 0.155 | U | 0.155 |
| EXC1-7 | J1V275 | 12/15/14 | 0.064 | B | 0.040 | 4350 | X | 13.6 | 7.5 | | 0.056 | 4.4 | X | 0.096 | 9.3 | | 0.21 | 0.155 | U | 0.155 |
| EXC1-8 | J1V276 | 12/15/14 | 0.20 | | 0.039 | 5380 | X | 13.3 | 21.0 | | 0.055 | 6.5 | X | 0.095 | 21.2 | | 0.21 | 0.317 | | 0.155 |
| EXC1-9 | J1V277 | 12/15/14 | 0.052 | B | 0.038 | 3700 | X | 13.2 | 7.0 | | 0.054 | 4.0 | X | 0.094 | 9.6 | | 0.20 | 0.155 | U | 0.155 |
| EXC1-10 | J1V278 | 12/15/14 | 0.059 | B | 0.040 | 6400 | X | 13.9 | 10.1 | | 0.057 | 5.3 | X | 0.098 | 11.0 | | 0.21 | 0.213 | | 0.155 |
| EXC1-11 | J1V279 | 12/15/14 | 0.085 | B | 0.042 | 4360 | X | 14.3 | 7.2 | | 0.059 | 5.1 | X | 0.10 | 10.1 | | 0.22 | 0.155 | U | 0.155 |
| EXC1-12 | J1V280 | 12/15/14 | 0.046 | B | 0.041 | 18200 | X | 13.9 | 11.5 | | 0.057 | 5.9 | X | 0.099 | 20.9 | | 0.21 | 0.201 | | 0.155 |
| EXC2-7 | J1V292 | 12/12/14 | 0.11 | B | 0.042 | 5420 | | 14.5 | 9.0 | | 0.060 | 6.5 | | 0.10 | 14.4 | | 0.22 | 0.155 | U | 0.155 |
| Duplicate of J1V292 | J1V298 | 12/12/14 | 0.097 | B | 0.041 | 5640 | | 14.1 | 8.1 | | 0.058 | 6.0 | | 0.10 | 12.8 | | 0.22 | 0.155 | U | 0.155 |
| EXC2-1 | J1V286 | 12/12/14 | 0.11 | BM | 0.041 | 5840 | | 14.1 | 9.3 | | 0.058 | 5.5 | | 0.10 | 12.2 | | 0.22 | 0.155 | U | 0.155 |
| EXC2-2 | J1V287 | 12/12/14 | 0.081 | B | 0.037 | 4470 | | 12.6 | 7.0 | | 0.052 | 6.7 | | 0.089 | 17.4 | | 0.19 | 0.155 | U | 0.155 |
| EXC2-3 | J1V288 | 12/12/14 | 0.069 | B | 0.040 | 5130 | | 13.7 | 8.7 | | 0.057 | 5.7 | | 0.097 | 10.8 | | 0.21 | 0.155 | U | 0.155 |
| EXC2-4 | J1V289 | 12/12/14 | 0.11 | B | 0.040 | 4920 | | 13.8 | 6.6 | | 0.057 | 6.8 | | 0.098 | 13.6 | | 0.21 | 0.169 | | 0.155 |
| EXC2-5 | J1V290 | 12/12/14 | 0.052 | B | 0.041 | 3980 | | 14.2 | 13.2 | | 0.058 | 6.6 | | 0.10 | 20.1 | | 0.22 | 0.214 | | 0.155 |
| EXC2-6 | J1V291 | 12/12/14 | 0.10 | B | 0.039 | 6060 | | 13.5 | 12.3 | | 0.055 | 7.6 | | 0.096 | 16.1 | | 0.21 | 0.356 | | 0.155 |
| EXC2-8 | J1V293 | 12/12/14 | 0.073 | B | 0.043 | 6240 | | 14.6 | 9.7 | | 0.060 | 6.2 | | 0.10 | 12.8 | | 0.23 | 0.155 | U | 0.155 |
| EXC2-9 | J1V294 | 12/12/14 | 0.067 | B | 0.040 | 5380 | | 13.9 | 8.5 | | 0.057 | 5.7 | | 0.098 | 11.9 | | 0.21 | 0.314 | | 0.155 |
| EXC2-10 | J1V295 | 12/12/14 | 0.084 | B | 0.039 | 3770 | | 13.3 | 4.4 | | 0.055 | 7.0 | | 0.094 | 12.4 | | 0.20 | 0.191 | | 0.155 |
| EXC2-11 | J1V296 | 12/12/14 | 0.080 | B | 0.036 | 4070 | | 12.5 | 5.3 | | 0.051 | 6.9 | | 0.088 | 13.4 | | 0.19 | 0.155 | U | 0.155 |
| EXC2-12 | J1V297 | 12/12/14 | 0.064 | B | 0.040 | 3890 | | 13.6 | 7.8 | | 0.056 | 5.2 | | 0.097 | 11.1 | | 0.21 | 0.155 | U | 0.155 |
| EXC1-1 | J1V269 | 12/15/14 | 0.042 | U | 0.042 | 5130 | X | 14.3 | 10.9 | | 0.059 | 6.5 | X | 0.10 | 13.3 | | 0.22 | 0.155 | U | 0.155 |
| Equipment blank 1 | J1V268 | 12/10/14 | 0.038 | U | 0.038 | 21.6 | B | 12.9 | 0.13 | B | 0.053 | 0.092 | U | 0.092 | 0.30 | B | 0.20 | | | |

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| Attachment | 1 | Sheet No. | 6 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Metals).**

| Sample Location | HEIS Number | Sample Date | Iron | | | Lead | | | Magnesium | | | Manganese | | | Mercury | | | Molybdenum | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| EXC1-4 | J1V272 | 12/15/14 | 15900 | | 3.6 | 6.3 | XJ | 0.26 | 5100 | X | 3.5 | 227 | X | 0.096 | 0.029 | | 0.0057 | 0.25 | U | 0.25 |
| Duplicate of J1V272 | J1V285 | 12/15/14 | 15600 | | 3.7 | 8.2 | XJ | 0.26 | 4850 | X | 3.6 | 217 | X | 0.097 | 0.040 | | 0.0059 | 0.25 | U | 0.25 |
| EXC1-1[a] | J1V543 | 3/16/15 | 17500 | X | 3.7 | 11.7 | | 0.24 | 4490 | | 3.6 | 264 | | 0.088 | 0.0092 | B | 0.0064 | 0.31 | B | 0.23 |
| EXC1-2 | J1V270 | 12/15/14 | 15600 | | 3.8 | 15.6 | XJ | 0.27 | 3480 | X | 3.7 | 217 | X | 0.10 | 0.063 | | 0.0056 | 0.26 | U | 0.26 |
| EXC1-3 | J1V271 | 12/15/14 | 10500 | | 3.8 | 1.7 | XJ | 0.27 | 2810 | X | 3.7 | 160 | X | 0.10 | 0.0055 | U | 0.0055 | 0.26 | U | 0.26 |
| EXC1-5 | J1V273 | 12/15/14 | 13600 | | 3.6 | 2.3 | XJ | 0.26 | 3510 | X | 3.5 | 199 | X | 0.095 | 0.0055 | U | 0.0055 | 0.25 | U | 0.25 |
| EXC1-6 | J1V274 | 12/15/14 | 14400 | | 3.8 | 2.7 | XJ | 0.27 | 4760 | X | 3.7 | 195 | X | 0.10 | 0.0056 | U | 0.0056 | 0.26 | U | 0.26 |
| EXC1-7 | J1V275 | 12/15/14 | 11600 | | 3.7 | 4.3 | XJ | 0.26 | 3000 | X | 3.6 | 173 | X | 0.096 | 0.0056 | U | 0.0056 | 0.25 | U | 0.25 |
| EXC1-8 | J1V276 | 12/15/14 | 17800 | | 3.6 | 12.5 | XJ | 0.26 | 5420 | X | 3.5 | 271 | X | 0.095 | 0.43 | | 0.0060 | 0.25 | U | 0.25 |
| EXC1-9 | J1V277 | 12/15/14 | 11600 | | 3.6 | 5.4 | XJ | 0.25 | 2700 | X | 3.5 | 167 | X | 0.094 | 0.0050 | U | 0.0050 | 0.24 | U | 0.24 |
| EXC1-10 | J1V278 | 12/15/14 | 14200 | | 3.7 | 30.2 | XJ | 0.27 | 3820 | X | 3.6 | 218 | X | 0.098 | 0.12 | | 0.0054 | 0.26 | U | 0.26 |
| EXC1-11 | J1V279 | 12/15/14 | 13700 | | 3.8 | 4.7 | XJ | 0.27 | 3220 | X | 3.7 | 189 | X | 0.10 | 0.013 | B | 0.0052 | 0.26 | U | 0.26 |
| EXC1-12 | J1V280 | 12/15/14 | 14100 | | 3.8 | 4.1 | XJ | 0.27 | 4270 | X | 3.7 | 253 | X | 0.099 | 0.0077 | B | 0.0056 | 0.30 | B | 0.26 |
| EXC2-7 | J1V292 | 12/12/14 | 17200 | | 3.9 | 9.4 | | 0.28 | 3800 | | 3.8 | 238 | | 0.10 | 0.0051 | U | 0.0051 | 0.27 | U | 0.27 |
| Duplicate of J1V292 | J1V298 | 12/12/14 | 16300 | | 3.8 | 9.7 | | 0.27 | 3670 | | 3.7 | 267 | | 0.10 | 0.0093 | B | 0.0057 | 0.26 | U | 0.26 |
| EXC2-1 | J1V286 | 12/12/14 | 14100 | | 3.8 | 2.6 | | 0.27 | 3800 | | 3.7 | 212 | | 0.10 | 0.0055 | U | 0.0055 | 0.26 | U | 0.26 |
| EXC2-2 | J1V287 | 12/12/14 | 16900 | | 3.4 | 2.2 | | 0.24 | 3620 | | 3.3 | 286 | | 0.089 | 0.0053 | U | 0.0053 | 0.23 | U | 0.23 |
| EXC2-3 | J1V288 | 12/12/14 | 15500 | | 3.7 | 10.2 | | 0.26 | 3640 | | 3.6 | 219 | | 0.097 | 0.0055 | U | 0.0055 | 0.25 | U | 0.25 |
| EXC2-4 | J1V289 | 12/12/14 | 19300 | | 3.7 | 2.2 | | 0.26 | 3280 | | 3.6 | 217 | | 0.098 | 0.0054 | U | 0.0054 | 0.25 | U | 0.25 |
| EXC2-5 | J1V290 | 12/12/14 | 16600 | | 3.8 | 2.9 | | 0.27 | 5310 | | 3.7 | 312 | | 0.10 | 0.015 | B | 0.0055 | 0.26 | U | 0.26 |
| EXC2-6 | J1V291 | 12/12/14 | 19000 | | 3.6 | 8.2 | | 0.26 | 4640 | | 3.5 | 264 | | 0.096 | 0.0058 | U | 0.0058 | 0.25 | U | 0.25 |
| EXC2-8 | J1V293 | 12/12/14 | 16200 | | 3.9 | 3.9 | | 0.28 | 4260 | | 3.8 | 241 | | 0.10 | 0.0057 | U | 0.0057 | 0.27 | U | 0.27 |
| EXC2-9 | J1V294 | 12/12/14 | 15900 | | 3.7 | 18.0 | | 0.27 | 3710 | | 3.6 | 223 | | 0.098 | 0.0051 | U | 0.0051 | 0.26 | U | 0.26 |
| EXC2-10 | J1V295 | 12/12/14 | 18000 | | 3.6 | 2.0 | | 0.25 | 3330 | | 3.5 | 211 | | 0.094 | 0.0053 | B | 0.0052 | 0.25 | U | 0.25 |
| EXC2-11 | J1V296 | 12/12/14 | 18700 | | 3.4 | 3.2 | | 0.24 | 3040 | | 3.3 | 228 | | 0.088 | 0.0051 | U | 0.0051 | 0.23 | U | 0.23 |
| EXC2-12 | J1V297 | 12/12/14 | 13200 | | 3.7 | 12.3 | | 0.26 | 3150 | | 3.6 | 192 | | 0.097 | 0.0055 | U | 0.0055 | 0.25 | U | 0.25 |
| EXC1-1 | J1V269 | 12/15/14 | 17200 | | 3.9 | 200 | MX | 0.27 | 3900 | X | 3.8 | 272 | X | 0.10 | 0.0056 | U | 0.0056 | 0.26 | U | 0.26 |
| Equipment blank 1 | J1V268 | 12/10/14 | 196 | | 3.5 | 0.25 | U | 0.25 | 14.2 | B | 3.4 | 4.0 | | 0.092 | 0.0051 | U | 0.0051 | 0.24 | U | 0.24 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 7 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Metals).**

| Sample Location | HEIS Number | Sample Date | Nickel | | | Potassium | | | Selenium | | | Silicon | | | Silver | | | Sodium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| EXC1-4 | J1V272 | 12/15/14 | 15.0 | X | 0.12 | 1030 | | 39.2 | 0.82 | U | 0.82 | 233 | NJ | 5.4 | 0.15 | U | 0.15 | 299 | | 56.4 |
| Duplicate of J1V272 | J1V285 | 12/15/14 | 14.6 | X | 0.12 | 975 | | 39.7 | 0.83 | U | 0.83 | 218 | NJ | 5.5 | 0.15 | U | 0.15 | 290 | | 57.1 |
| EXC1-1[a] | J1V543 | 3/16/15 | 12.8 | X | 0.11 | 789 | | 35.9 | 0.75 | U | 0.75 | 257 | N | 5.6 | 0.14 | U | 0.14 | 498 | M | 51.7 |
| EXC1-2 | J1V270 | 12/15/14 | 9.2 | X | 0.12 | 806 | | 41.3 | 0.87 | U | 0.87 | 147 | NJ | 5.7 | 0.16 | U | 0.16 | 251 | | 59.5 |
| EXC1-3 | J1V271 | 12/15/14 | 7.4 | X | 0.12 | 413 | | 41.0 | 0.86 | U | 0.86 | 102 | NJ | 5.7 | 0.16 | U | 0.16 | 160 | | 58.9 |
| EXC1-5 | J1V273 | 12/15/14 | 7.3 | X | 0.12 | 590 | | 38.8 | 0.81 | U | 0.81 | 115 | NJ | 5.4 | 0.15 | U | 0.15 | 252 | | 55.8 |
| EXC1-6 | J1V274 | 12/15/14 | 22.2 | X | 0.12 | 501 | | 41.1 | 0.86 | U | 0.86 | 108 | NJ | 5.7 | 0.16 | U | 0.16 | 157 | | 59.1 |
| EXC1-7 | J1V275 | 12/15/14 | 6.8 | X | 0.12 | 532 | | 39.6 | 0.83 | U | 0.83 | 118 | NJ | 5.5 | 0.15 | U | 0.15 | 137 | | 56.9 |
| EXC1-8 | J1V276 | 12/15/14 | 17.2 | X | 0.12 | 1200 | | 38.8 | 0.81 | U | 0.81 | 219 | NJ | 5.4 | 0.15 | U | 0.15 | 264 | | 55.8 |
| EXC1-9 | J1V277 | 12/15/14 | 8.6 | X | 0.12 | 459 | | 38.5 | 0.81 | U | 0.81 | 115 | NJ | 5.3 | 0.15 | U | 0.15 | 136 | | 55.4 |
| EXC1-10 | J1V278 | 12/15/14 | 9.9 | X | 0.12 | 1030 | | 40.3 | 0.85 | U | 0.85 | 163 | NJ | 5.6 | 0.16 | U | 0.16 | 250 | | 58.0 |
| EXC1-11 | J1V279 | 12/15/14 | 8.2 | X | 0.12 | 528 | | 41.5 | 0.87 | U | 0.87 | 118 | NJ | 5.7 | 0.16 | U | 0.16 | 197 | | 59.8 |
| EXC1-12 | J1V280 | 12/15/14 | 10.9 | X | 0.12 | 836 | | 40.6 | 0.85 | U | 0.85 | 150 | NJ | 5.6 | 0.16 | U | 0.16 | 356 | | 58.4 |
| EXC2-7 | J1V292 | 12/12/14 | 10.4 | | 0.13 | 780 | | 42.2 | 0.89 | U | 0.89 | 173 | N | 5.8 | 0.16 | U | 0.16 | 197 | | 60.8 |
| Duplicate of J1V292 | J1V298 | 12/12/14 | 10.0 | | 0.12 | 733 | | 41.1 | 0.86 | U | 0.86 | 154 | N | 5.7 | 0.16 | U | 0.16 | 234 | | 59.1 |
| EXC2-1 | J1V286 | 12/12/14 | 9.7 | | 0.12 | 615 | | 40.9 | 0.86 | U | 0.86 | 141 | N | 5.6 | 0.16 | U | 0.16 | 191 | | 58.8 |
| EXC2-2 | J1V287 | 12/12/14 | 7.6 | | 0.11 | 565 | | 36.5 | 0.77 | U | 0.77 | 112 | N | 5.0 | 0.14 | U | 0.14 | 191 | | 52.5 |
| EXC2-3 | J1V288 | 12/12/14 | 8.8 | | 0.12 | 780 | | 40.0 | 0.84 | U | 0.84 | 169 | N | 5.5 | 0.16 | U | 0.16 | 214 | | 57.5 |
| EXC2-4 | J1V289 | 12/12/14 | 6.5 | | 0.12 | 510 | | 40.1 | 0.84 | U | 0.84 | 87.1 | N | 5.5 | 0.16 | U | 0.16 | 264 | | 57.7 |
| EXC2-5 | J1V290 | 12/12/14 | 11.0 | | 0.12 | 667 | | 41.3 | 0.87 | U | 0.87 | 132 | N | 5.7 | 0.16 | U | 0.16 | 179 | | 59.4 |
| EXC2-6 | J1V291 | 12/12/14 | 13.6 | | 0.12 | 832 | | 39.2 | 0.82 | U | 0.82 | 161 | N | 5.4 | 0.15 | U | 0.15 | 267 | | 56.4 |
| EXC2-8 | J1V293 | 12/12/14 | 10.1 | | 0.13 | 722 | | 42.6 | 0.89 | U | 0.89 | 194 | N | 5.9 | 0.17 | U | 0.17 | 284 | | 61.2 |
| EXC2-9 | J1V294 | 12/12/14 | 10.2 | | 0.12 | 771 | | 40.4 | 0.85 | U | 0.85 | 177 | N | 5.6 | 0.16 | U | 0.16 | 206 | | 58.1 |
| EXC2-10 | J1V295 | 12/12/14 | 6.0 | | 0.12 | 377 | | 38.7 | 0.81 | U | 0.81 | 70.9 | N | 5.3 | 0.15 | U | 0.15 | 239 | | 55.7 |
| EXC2-11 | J1V296 | 12/12/14 | 8.1 | | 0.11 | 431 | | 36.2 | 0.76 | U | 0.76 | 91.8 | N | 5.0 | 0.14 | U | 0.14 | 211 | | 52.2 |
| EXC2-12 | J1V297 | 12/12/14 | 7.3 | | 0.12 | 729 | | 39.6 | 0.83 | U | 0.83 | 143 | N | 5.5 | 0.15 | U | 0.15 | 175 | | 57.0 |
| EXC1-1 | J1V269 | 12/15/14 | 10.6 | X | 0.13 | 1260 | | 41.7 | 0.88 | U | 0.88 | 211 | N | 5.8 | 0.16 | U | 0.16 | 214 | | 60.0 |
| Equipment blank 1 | J1V268 | 12/10/14 | 0.11 | U | 0.11 | 37.6 | U | 37.6 | 0.79 | U | 0.79 | 85.7 | | 5.2 | 0.15 | U | 0.15 | 54.1 | U | 54.1 |

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| Attachment | 1 | Sheet No. | 8 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Metals).**

| Sample Location | HEIS Number | Sample Date | Vanadium | | | Zinc | | |
|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL |
| EXC1-4 | J1V272 | 12/15/14 | 30.8 | | 0.090 | 41.4 | X | 0.38 |
| Duplicate of J1V272 | J1V285 | 12/15/14 | 31.3 | | 0.091 | 42.3 | X | 0.38 |
| EXC1-1[a] | J1V543 | 3/16/15 | 43.5 | | 0.082 | 34.7 | | 0.35 |
| EXC1-2 | J1V270 | 12/15/14 | 39.0 | | 0.095 | 31.9 | X | 0.40 |
| EXC1-3 | J1V271 | 12/15/14 | 25.4 | | 0.094 | 20.6 | X | 0.40 |
| EXC1-5 | J1V273 | 12/15/14 | 34.0 | | 0.089 | 27.2 | X | 0.38 |
| EXC1-6 | J1V274 | 12/15/14 | 34.3 | | 0.094 | 26.0 | X | 0.40 |
| EXC1-7 | J1V275 | 12/15/14 | 30.3 | | 0.091 | 22.4 | X | 0.38 |
| EXC1-8 | J1V276 | 12/15/14 | 33.8 | | 0.089 | 48.7 | X | 0.38 |
| EXC1-9 | J1V277 | 12/15/14 | 28.6 | | 0.088 | 20.4 | X | 0.37 |
| EXC1-10 | J1V278 | 12/15/14 | 30.6 | | 0.092 | 30.7 | X | 0.39 |
| EXC1-11 | J1V279 | 12/15/14 | 37.1 | | 0.095 | 25.6 | X | 0.40 |
| EXC1-12 | J1V280 | 12/15/14 | 35.9 | | 0.093 | 44.2 | X | 0.39 |
| EXC2-7 | J1V292 | 12/12/14 | 43.9 | | 0.097 | 34.1 | | 0.41 |
| Duplicate of J1V292 | J1V298 | 12/12/14 | 39.3 | | 0.094 | 33.6 | | 0.40 |
| EXC2-1 | J1V286 | 12/12/14 | 40.1 | | 0.094 | 28.5 | | 0.40 |
| EXC2-2 | J1V287 | 12/12/14 | 33.3 | | 0.084 | 29.8 | | 0.35 |
| EXC2-3 | J1V288 | 12/12/14 | 34.2 | | 0.092 | 30.6 | | 0.39 |
| EXC2-4 | J1V289 | 12/12/14 | 59.2 | | 0.092 | 34.4 | | 0.39 |
| EXC2-5 | J1V290 | 12/12/14 | 41.8 | | 0.095 | 32.3 | | 0.40 |
| EXC2-6 | J1V291 | 12/12/14 | 48.6 | | 0.090 | 38.8 | | 0.38 |
| EXC2-8 | J1V293 | 12/12/14 | 40.2 | | 0.098 | 31.5 | | 0.41 |
| EXC2-9 | J1V294 | 12/12/14 | 36.6 | | 0.093 | 32.0 | | 0.39 |
| EXC2-10 | J1V295 | 12/12/14 | 49.7 | | 0.089 | 32.5 | | 0.38 |
| EXC2-11 | J1V296 | 12/12/14 | 50.2 | | 0.083 | 31.1 | | 0.35 |
| EXC2-12 | J1V297 | 12/12/14 | 32.8 | | 0.091 | 29.7 | | 0.38 |
| EXC1-1 | J1V269 | 12/15/14 | 38.4 | | 0.096 | 46.0 | X | 0.41 |
| Equipment blank 1 | J1V268 | 12/10/14 | 0.20 | B | 0.086 | 0.83 | B | 0.37 |

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| Attachment | 1 | Sheet No. | 9 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Metals).**

| Sample Location | HEIS Number | Sample Date | Aluminum | | | Antimony | | | Arsenic | | | Barium | | | Beryllium | | | Boron | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| SPA-1 | J1V4L5 | 2/26/15 | 7050 | X | 1.4 | 0.41 | B | 0.34 | 3.7 | | 0.58 | 61.6 | X | 0.067 | 0.26 | | 0.029 | 1.0 | B | 0.86 |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 6820 | X | 1.5 | 0.36 | U | 0.36 | 4.0 | | 0.62 | 61.8 | X | 0.071 | 0.26 | | 0.031 | 0.92 | U | 0.92 |
| SPA-2 | J1V4L6 | 2/26/15 | 6480 | X | 1.4 | 0.35 | U | 0.35 | 3.6 | | 0.62 | 68.0 | X | 0.071 | 0.26 | | 0.031 | 1.6 | B | 0.91 |
| SPA-3 | J1V4L7 | 2/26/15 | 6090 | X | 1.4 | 0.34 | U | 0.34 | 4.1 | | 0.60 | 51.4 | X | 0.069 | 0.24 | | 0.030 | 0.90 | B | 0.89 |
| SPA-4 | J1V4L8 | 2/26/15 | 6460 | X | 1.5 | 0.36 | U | 0.36 | 4.0 | | 0.62 | 50.8 | X | 0.071 | 0.23 | | 0.031 | 1.4 | B | 0.92 |
| SPA-5 | J1V4L9 | 2/26/15 | 5890 | X | 1.4 | 0.34 | U | 0.34 | 2.1 | | 0.59 | 40.0 | X | 0.067 | 0.21 | | 0.029 | 1.0 | B | 0.87 |
| SPA-6 | J1V4M0 | 2/26/15 | 5730 | X | 1.5 | 0.42 | B | 0.36 | 2.8 | | 0.63 | 40.6 | X | 0.072 | 0.22 | | 0.031 | 1.0 | B | 0.93 |
| SPA-7 | J1V4M1 | 2/26/15 | 7030 | X | 1.4 | 0.50 | B | 0.34 | 3.5 | | 0.60 | 145 | X | 0.069 | 0.29 | | 0.030 | 12.0 | | 0.89 |
| SPA-8 | J1V4M2 | 2/26/15 | 9200 | X | 1.5 | 0.37 | U | 0.37 | 3.4 | | 0.63 | 80.9 | X | 0.073 | 0.38 | | 0.032 | 1.2 | B | 0.94 |
| SPA-9 | J1V4M3 | 2/26/15 | 6170 | X | 1.5 | 0.39 | B | 0.37 | 3.3 | | 0.65 | 57.6 | X | 0.075 | 0.23 | | 0.032 | 0.96 | U | 0.96 |
| SPA-10 | J1V4M4 | 2/26/15 | 6320 | X | 1.5 | 0.36 | U | 0.36 | 4.4 | | 0.63 | 47.0 | X | 0.073 | 0.23 | | 0.031 | 1.0 | B | 0.93 |
| SPA-11 | J1V4M5 | 4/2/15 | 5770 | X | 1.4 | 0.33 | U | 0.33 | 1.7 | | 0.58 | 40.5 | X | 0.067 | 0.13 | B | 0.029 | 0.86 | U | 0.86 |
| SPA-12 | J1V4M6 | 4/2/15 | 8620 | X | 1.4 | 0.34 | U | 0.34 | 16.6 | | 0.59 | 62.8 | X | 0.068 | 0.21 | | 0.030 | 1.4 | B | 0.88 |
| SPA-13 | J1V4M7 | 2/26/15 | 9940 | X | 1.5 | 0.37 | U | 0.37 | 56.0 | | 0.65 | 91.1 | X | 0.074 | 0.37 | | 0.032 | 2.5 | | 0.96 |
| SPA-14 | J1V4M8 | 2/26/15 | 7280 | X | 1.5 | 0.36 | U | 0.36 | 6.1 | | 0.62 | 54.6 | X | 0.071 | 0.26 | | 0.031 | 1.4 | B | 0.92 |
| SPA-15 | J1V4M9 | 4/2/15 | 10300 | X | 1.5 | 0.37 | U | 0.37 | 21.9 | | 0.64 | 85.9 | X | 0.073 | 0.25 | | 0.032 | 2.9 | | 0.95 |
| OVB-9[a] | J1V4N1 | 2/26/15 | 5960 | | 1.4 | 0.35 | U | 0.35 | 4.9 | | 0.62 | 43.9 | | 0.071 | 0.15 | B | 0.031 | 1.1 | B | 0.92 |
| Duplicate of J1V4N1[a] | J1V4N3 | 2/26/15 | 5680 | | 1.5 | 0.36 | U | 0.36 | 5.0 | | 0.62 | 42.5 | | 0.072 | 0.14 | B | 0.031 | 0.93 | U | 0.93 |
| OVB-1 | J1V255 | 12/10/14 | 5690 | | 1.6 | 0.38 | U | 0.38 | 4.9 | | 0.66 | 58.7 | | 0.076 | 0.033 | U | 0.033 | 0.98 | U | 0.98 |
| OVB-2 | J1V256 | 12/10/14 | 7080 | | 1.5 | 0.37 | U | 0.37 | 4.0 | | 0.65 | 66.9 | | 0.075 | 0.032 | U | 0.032 | 1.1 | B | 0.96 |
| OVB-3 | J1V257 | 12/10/14 | 6360 | | 1.6 | 0.38 | U | 0.38 | 8.2 | | 0.66 | 55.1 | | 0.076 | 0.033 | U | 0.033 | 0.98 | U | 0.98 |
| OVB-4 | J1V258 | 12/10/14 | 6330 | | 1.4 | 0.35 | U | 0.35 | 6.9 | | 0.61 | 53.2 | | 0.070 | 0.030 | U | 0.030 | 0.90 | U | 0.90 |
| OVB-5 | J1V259 | 12/10/14 | 7610 | | 1.5 | 1.8 | U | 1.8 | 3.9 | | 0.64 | 52.3 | | 0.074 | 0.044 | B | 0.032 | 1.3 | B | 0.95 |
| OVB-6 | J1V260 | 12/10/14 | 6840 | | 1.5 | 0.38 | U | 0.38 | 15.8 | | 0.66 | 54.5 | | 0.075 | 0.033 | U | 0.033 | 1.1 | B | 0.97 |
| OVB-7 | J1V261 | 12/10/14 | 6440 | | 1.4 | 0.35 | U | 0.35 | 5.2 | | 0.60 | 47.7 | | 0.070 | 0.030 | U | 0.030 | 1.5 | B | 0.90 |
| OVB-8 | J1V262 | 12/10/14 | 5340 | | 1.4 | 0.35 | U | 0.35 | 7.2 | | 0.60 | 39.1 | | 0.070 | 0.030 | U | 0.030 | 0.90 | U | 0.90 |
| OVB-10 | J1V264 | 12/10/14 | 6130 | | 1.6 | 0.39 | U | 0.39 | 8.5 | | 0.68 | 47.2 | | 0.078 | 0.034 | U | 0.034 | 1.0 | U | 1.0 |
| OVB-11 | J1V265 | 12/10/14 | 5310 | | 1.5 | 0.38 | U | 0.38 | 6.4 | | 0.65 | 44.5 | | 0.075 | 0.033 | U | 0.033 | 0.97 | U | 0.97 |
| OVB-12[a] | J1V4N2 | 2/26/15 | 6090 | | 1.5 | 0.37 | U | 0.37 | 5.5 | | 0.64 | 52.9 | | 0.074 | 0.16 | B | 0.032 | 0.95 | U | 0.95 |
| OVB-9 | J1V263 | 12/10/14 | 7070 | | 1.7 | 0.42 | U | 0.42 | 7.8 | | 0.72 | 58.5 | | 0.083 | 0.036 | U | 0.036 | 1.1 | U | 1.1 |
| Duplicate of J1V263 | J1V267 | 12/10/14 | 7050 | | 1.6 | 0.39 | U | 0.39 | 7.6 | | 0.68 | 55.2 | | 0.078 | 0.034 | U | 0.034 | 1.0 | U | 1.0 |
| OVB-12 | J1V266 | 12/10/14 | 5740 | | 1.6 | 2.0 | U | 2.0 | 5.6 | | 0.69 | 52.3 | | 0.080 | 0.035 | U | 0.035 | 1.0 | U | 1.0 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 10 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Metals).**

| Sample Location | HEIS Number | Sample Date | Cadmium | | | Calcium | | | Chromium | | | Cobalt | | | Copper | | | Hexavalent Chromium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| SPA-1 | J1V4L5 | 2/26/15 | 0.11 | B | 0.036 | 8780 | X | 12.4 | 10.4 | | 0.051 | 5.9 | X | 0.088 | 10.8 | X | 0.19 | 0.305 | | 0.155 |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 0.11 | B | 0.038 | 9000 | X | 13.2 | 9.9 | | 0.054 | 5.5 | X | 0.094 | 10.9 | X | 0.20 | 0.240 | | 0.155 |
| SPA-2 | J1V4L6 | 2/26/15 | 0.15 | B | 0.038 | 6170 | X | 13.2 | 9.8 | | 0.054 | 6.2 | X | 0.093 | 15.1 | X | 0.20 | 0.155 | U | 0.155 |
| SPA-3 | J1V4L7 | 2/26/15 | 0.13 | B | 0.037 | 4880 | X | 12.7 | 9.3 | | 0.052 | 5.6 | X | 0.090 | 13.7 | X | 0.20 | 0.280 | | 0.155 |
| SPA-4 | J1V4L8 | 2/26/15 | 0.14 | B | 0.038 | 6900 | X | 13.2 | 9.7 | | 0.054 | 5.9 | X | 0.094 | 14.4 | X | 0.20 | 0.258 | | 0.155 |
| SPA-5 | J1V4L9 | 2/26/15 | 0.11 | B | 0.036 | 5880 | X | 12.5 | 9.8 | | 0.051 | 5.1 | X | 0.089 | 12.7 | X | 0.19 | 0.155 | U | 0.155 |
| SPA-6 | J1V4M0 | 2/26/15 | 0.12 | B | 0.039 | 5980 | X | 13.4 | 9.0 | | 0.055 | 5.4 | X | 0.095 | 12.5 | X | 0.21 | 0.192 | | 0.155 |
| SPA-7 | J1V4M1 | 2/26/15 | 0.13 | B | 0.037 | 8810 | X | 12.8 | 10.0 | | 0.052 | 6.2 | X | 0.090 | 15.7 | X | 0.20 | 0.155 | U | 0.155 |
| SPA-8 | J1V4M2 | 2/26/15 | 0.13 | B | 0.039 | 3880 | X | 13.6 | 12.6 | | 0.056 | 7.7 | X | 0.096 | 16.4 | X | 0.21 | 0.282 | | 0.155 |
| SPA-9 | J1V4M3 | 2/26/15 | 0.14 | B | 0.040 | 8230 | X | 13.8 | 9.6 | | 0.057 | 5.4 | X | 0.098 | 14.4 | X | 0.21 | 0.155 | U | 0.155 |
| SPA-10 | J1V4M4 | 2/26/15 | 0.13 | B | 0.039 | 6150 | X | 13.5 | 9.5 | | 0.055 | 5.9 | X | 0.095 | 15.8 | X | 0.21 | 0.176 | | 0.155 |
| SPA-11 | J1V4M5 | 4/2/15 | 0.13 | B | 0.036 | 4590 | X | 12.3 | 7.8 | X | 0.051 | 6.6 | X | 0.088 | 12.6 | | 0.19 | 0.155 | U | 0.155 |
| SPA-12 | J1V4M6 | 4/2/15 | 0.086 | B | 0.037 | 5860 | X | 12.7 | 12.5 | X | 0.052 | 6.6 | X | 0.090 | 13.8 | | 0.20 | 0.256 | | 0.155 |
| SPA-13 | J1V4M7 | 2/26/15 | 0.65 | | 0.040 | 4480 | X | 13.8 | 13.1 | | 0.057 | 7.9 | X | 0.098 | 16.8 | X | 0.21 | 0.155 | U | 0.155 |
| SPA-14 | J1V4M8 | 2/26/15 | 0.15 | B | 0.038 | 7270 | X | 13.2 | 11.2 | | 0.054 | 6.1 | X | 0.094 | 14.1 | X | 0.20 | 0.155 | U | 0.155 |
| SPA-15 | J1V4M9 | 4/2/15 | 0.13 | B | 0.040 | 5710 | X | 13.6 | 13.7 | X | 0.056 | 7.7 | X | 0.096 | 25.8 | | 0.21 | 0.155 | U | 0.155 |
| OVB-9[a] | J1V4N1 | 2/26/15 | 0.15 | B | 0.038 | 5380 | | 13.2 | 10.9 | X | 0.054 | 6.1 | X | 0.093 | 12.7 | | 0.20 | 0.314 | | 0.155 |
| Duplicate of J1V4N1[a] | J1V4N3 | 2/26/15 | 0.15 | B | 0.039 | 5350 | | 13.3 | 9.9 | X | 0.055 | 5.7 | X | 0.095 | 13.2 | | 0.21 | 0.295 | | 0.155 |
| OVB-1 | J1V255 | 12/10/14 | 0.064 | B | 0.041 | 4800 | | 14.1 | 8.3 | MN | 0.058 | 4.9 | M | 0.10 | 13.0 | | 0.22 | 0.233 | | 0.155 |
| OVB-2 | J1V256 | 12/10/14 | 0.11 | B | 0.040 | 5440 | | 13.8 | 13.8 | | 0.057 | 6.2 | | 0.098 | 15.1 | | 0.21 | 0.320 | | 0.155 |
| OVB-3 | J1V257 | 12/10/14 | 0.067 | B | 0.041 | 5480 | | 14.1 | 9.6 | | 0.058 | 5.8 | | 0.10 | 14.2 | | 0.22 | 0.276 | | 0.155 |
| OVB-4 | J1V258 | 12/10/14 | 0.042 | B | 0.038 | 3940 | | 13.0 | 24.4 | | 0.053 | 5.8 | | 0.092 | 19.2 | | 0.20 | 0.607 | | 0.155 |
| OVB-5 | J1V259 | 12/10/14 | 0.075 | B | 0.04 | 4960 | | 13.7 | 13.7 | | 0.056 | 6.2 | | 0.097 | 18.7 | | 0.21 | 0.273 | | 0.155 |
| OVB-6 | J1V260 | 12/10/14 | 0.041 | U | 0.041 | 5300 | | 14.0 | 10.0 | | 0.058 | 6.7 | | 0.099 | 14.8 | | 0.22 | 0.318 | | 0.155 |
| OVB-7 | J1V261 | 12/10/14 | 0.088 | B | 0.037 | 5440 | | 12.9 | 12.1 | | 0.053 | 5.7 | | 0.091 | 14.2 | | 0.20 | 0.319 | | 0.155 |
| OVB-8 | J1V262 | 12/10/14 | 0.038 | B | 0.038 | 4710 | | 12.9 | 8.3 | | 0.053 | 5.6 | | 0.092 | 15.0 | | 0.20 | 0.274 | | 0.155 |
| OVB-10 | J1V264 | 12/10/14 | 0.053 | B | 0.042 | 5150 | | 14.5 | 8.8 | | 0.060 | 5.9 | | 0.10 | 15.6 | | 0.22 | 0.341 | | 0.155 |
| OVB-11 | J1V265 | 12/10/14 | 0.049 | B | 0.041 | 4780 | | 14.0 | 8.6 | | 0.057 | 5.4 | | 0.099 | 12.4 | | 0.22 | 0.249 | | 0.155 |
| OVB-12[a] | J1V4N2 | 2/26/15 | 0.17 | B | 0.040 | 5190 | | 13.7 | 10.9 | X | 0.056 | 7.3 | X | 0.097 | 14.1 | | 0.21 | 0.315 | | 0.155 |
| OVB-9 | J1V263 | 12/10/14 | 0.061 | B | 0.045 | 5860 | | 15.5 | 11.9 | | 0.064 | 6.3 | | 0.11 | 14.5 | | 0.24 | 0.407 | | 0.155 |
| Duplicate of J1V263 | J1V267 | 12/10/14 | 0.062 | B | 0.042 | 5840 | | 14.5 | 11.0 | | 0.059 | 6.1 | | 0.10 | 13.7 | | 0.22 | 0.256 | | 0.155 |
| OVB-12 | J1V266 | 12/10/14 | 0.086 | B | 0.043 | 5630 | | 14.8 | 8.0 | | 0.061 | 6.2 | | 0.11 | 13.8 | | 0.23 | 0.184 | | 0.155 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 11 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Metals).**

| Sample Location | HEIS Number | Sample Date | Iron | | | Lead | | | Magnesium | | | Manganese | | | Mercury | | | Molybdenum | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| SPA-1 | J1V4L5 | 2/26/15 | 18300 | X | 3.4 | 4.3 | | 0.24 | 5040 | X | 3.3 | 320 | X | 0.088 | 0.0066 | U | 0.0066 | 0.23 | U | 0.23 |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 16300 | X | 3.6 | 3.8 | | 0.25 | 4840 | X | 3.5 | 275 | X | 0.094 | 0.0058 | U | 0.0058 | 0.24 | U | 0.24 |
| SPA-2 | J1V4L6 | 2/26/15 | 18000 | X | 3.5 | 8.2 | | 0.25 | 4110 | X | 3.5 | 257 | X | 0.093 | 0.0073 | B | 0.0068 | 0.24 | U | 0.24 |
| SPA-3 | J1V4L7 | 2/26/15 | 15800 | X | 3.4 | 6.0 | | 0.24 | 3980 | X | 3.3 | 244 | X | 0.090 | 0.022 | | 0.0061 | 0.23 | U | 0.23 |
| SPA-4 | J1V4L8 | 2/26/15 | 16500 | X | 3.6 | 13.2 | | 0.25 | 4300 | X | 3.5 | 259 | X | 0.094 | 0.041 | | 0.0062 | 0.24 | U | 0.24 |
| SPA-5 | J1V4L9 | 2/26/15 | 15000 | X | 3.4 | 4.2 | | 0.24 | 4280 | X | 3.3 | 233 | X | 0.089 | 0.0099 | B | 0.0066 | 0.23 | U | 0.23 |
| SPA-6 | J1V4M0 | 2/26/15 | 15500 | X | 3.6 | 3.0 | | 0.26 | 4280 | X | 3.5 | 242 | X | 0.095 | 0.0065 | U | 0.0065 | 0.25 | U | 0.25 |
| SPA-7 | J1V4M1 | 2/26/15 | 17600 | X | 3.4 | 7.0 | | 0.24 | 4650 | X | 3.3 | 265 | X | 0.090 | 0.012 | B | 0.0068 | 0.29 | B | 0.24 |
| SPA-8 | J1V4M2 | 2/26/15 | 20200 | X | 3.7 | 5.1 | | 0.26 | 5300 | X | 3.6 | 332 | X | 0.096 | 0.0066 | U | 0.0066 | 0.25 | U | 0.25 |
| SPA-9 | J1V4M3 | 2/26/15 | 16200 | X | 3.7 | 7.4 | | 0.27 | 3950 | X | 3.6 | 430 | X | 0.098 | 0.0066 | U | 0.0066 | 0.26 | U | 0.26 |
| SPA-10 | J1V4M4 | 2/26/15 | 16200 | X | 3.6 | 8.8 | | 0.26 | 4440 | X | 3.5 | 262 | X | 0.095 | 0.012 | B | 0.0065 | 0.25 | U | 0.25 |
| SPA-11 | J1V4M5 | 4/2/15 | 17100 | X | 3.3 | 2.6 | | 0.24 | 3300 | X | 3.2 | 218 | X | 0.088 | 0.0064 | U | 0.0064 | 0.23 | U | 0.23 |
| SPA-12 | J1V4M6 | 4/2/15 | 17500 | X | 3.4 | 59.2 | | 0.24 | 4350 | X | 3.3 | 256 | X | 0.090 | 0.043 | | 0.0062 | 0.23 | U | 0.23 |
| SPA-13 | J1V4M7 | 2/26/15 | 20800 | X | 3.7 | 296 | | 0.26 | 4820 | X | 3.6 | 378 | X | 0.098 | 0.0079 | B | 0.0070 | 0.25 | U | 0.25 |
| SPA-14 | J1V4M8 | 2/26/15 | 16500 | X | 3.6 | 18.2 | | 0.25 | 4720 | X | 3.5 | 273 | X | 0.094 | 0.0069 | U | 0.0069 | 0.24 | U | 0.24 |
| SPA-15 | J1V4M9 | 4/2/15 | 19400 | X | 3.7 | 54.8 | | 0.26 | 4910 | X | 3.6 | 291 | X | 0.096 | 0.020 | | 0.0065 | 0.25 | U | 0.25 |
| OVB-9[a] | J1V4N1 | 2/26/15 | 14800 | | 3.5 | 13.5 | X | 0.25 | 4320 | X | 3.5 | 248 | X | 0.093 | 0.0069 | U | 0.0069 | 0.24 | U | 0.24 |
| Duplicate of J1V4N1[a] | J1V4N3 | 2/26/15 | 14000 | | 3.6 | 13.5 | X | 0.26 | 3960 | X | 3.5 | 230 | X | 0.095 | 0.0061 | U | 0.0061 | 0.25 | U | 0.25 |
| OVB-1 | J1V255 | 12/10/14 | 12900 | | 3.8 | 14.4 | | 0.27 | 3600 | MN | 3.7 | 212 | | 0.10 | 0.0087 | B | 0.0056 | 0.26 | U | 0.26 |
| OVB-2 | J1V256 | 12/10/14 | 17000 | | 3.7 | 6.5 | | 0.27 | 4720 | | 3.6 | 262 | | 0.098 | 0.0063 | B | 0.0056 | 0.26 | U | 0.26 |
| OVB-3 | J1V257 | 12/10/14 | 15200 | | 3.8 | 24.2 | | 0.27 | 4060 | | 3.7 | 242 | | 0.10 | 0.0077 | B | 0.0054 | 0.26 | U | 0.26 |
| OVB-4 | J1V258 | 12/10/14 | 15400 | | 3.5 | 14.8 | | 0.25 | 4420 | | 3.4 | 255 | | 0.092 | 0.0088 | B | 0.0056 | 0.24 | U | 0.24 |
| OVB-5 | J1V259 | 12/10/14 | 15900 | | 3.7 | 6.7 | | 0.26 | 5420 | | 3.6 | 317 | | 0.097 | 0.0077 | B | 0.0058 | 0.25 | U | 0.25 |
| OVB-6 | J1V260 | 12/10/14 | 17300 | | 3.8 | 53.5 | | 0.27 | 4520 | | 3.7 | 285 | | 0.099 | 0.0084 | B | 0.0057 | 0.26 | U | 0.26 |
| OVB-7 | J1V261 | 12/10/14 | 15300 | | 3.5 | 13.3 | | 0.25 | 4550 | | 3.4 | 248 | | 0.091 | 0.0066 | B | 0.0053 | 0.24 | U | 0.24 |
| OVB-8 | J1V262 | 12/10/14 | 12900 | | 3.5 | 24.8 | | 0.25 | 3520 | | 3.4 | 244 | | 0.092 | 0.0052 | U | 0.0052 | 0.24 | U | 0.24 |
| OVB-10 | J1V264 | 12/10/14 | 15900 | | 3.9 | 26.3 | | 0.28 | 4050 | | 3.8 | 262 | | 0.10 | 0.0057 | U | 0.0057 | 0.27 | U | 0.27 |
| OVB-11 | J1V265 | 12/10/14 | 14800 | | 3.8 | 18.6 | | 0.27 | 3710 | | 3.7 | 227 | | 0.099 | 0.007 | B | 0.0057 | 0.26 | U | 0.26 |
| OVB-12[a] | J1V4N2 | 2/26/15 | 16900 | | 3.7 | 16.2 | X | 0.26 | 4250 | X | 3.6 | 265 | X | 0.097 | 0.0058 | U | 0.0058 | 0.25 | U | 0.25 |
| OVB-9 | J1V263 | 12/10/14 | 16500 | | 4.2 | 21.5 | | 0.30 | 4720 | | 4.1 | 272 | | 0.11 | 0.0066 | B | 0.0056 | 0.28 | U | 0.28 |
| Duplicate of J1V263 | J1V267 | 12/10/14 | 16100 | | 3.9 | 20.6 | | 0.28 | 4620 | | 3.8 | 280 | | 0.10 | 0.0064 | B | 0.0057 | 0.27 | U | 0.27 |
| OVB-12 | J1V266 | 12/10/14 | 16700 | | 4.0 | 14.2 | | 0.28 | 3980 | | 3.9 | 245 | | 0.11 | 0.012 | B | 0.0056 | 0.27 | U | 0.27 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 12 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Metals).**

| Sample Location | HEIS Number | Sample Date | Nickel | | | Potassium | | | Selenium | | | Silicon | | | Silver | | | Sodium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| SPA-1 | J1V4L5 | 2/26/15 | 10.9 | X | 0.11 | 1180 | | 36.2 | 0.76 | U | 0.76 | 271 | NX | 5.0 | 0.14 | U | 0.14 | 175 | | 52.1 |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 10.6 | X | 0.12 | 1200 | | 38.5 | 0.81 | U | 0.81 | 318 | NX | 5.3 | 0.15 | U | 0.15 | 183 | | 55.3 |
| SPA-2 | J1V4L6 | 2/26/15 | 10.3 | X | 0.11 | 1020 | | 38.3 | 0.80 | U | 0.80 | 272 | NX | 5.3 | 0.15 | U | 0.15 | 204 | | 55.1 |
| SPA-3 | J1V4L7 | 2/26/15 | 9.4 | X | 0.11 | 906 | | 37.0 | 0.78 | U | 0.78 | 265 | NX | 5.1 | 0.14 | U | 0.14 | 186 | | 53.3 |
| SPA-4 | J1V4L8 | 2/26/15 | 10.4 | X | 0.12 | 935 | | 38.4 | 0.80 | U | 0.80 | 364 | NX | 5.3 | 0.15 | U | 0.15 | 243 | | 55.2 |
| SPA-5 | J1V4L9 | 2/26/15 | 10.3 | X | 0.11 | 922 | | 36.4 | 0.76 | U | 0.76 | 244 | NX | 5.0 | 0.14 | U | 0.14 | 190 | | 52.3 |
| SPA-6 | J1V4M0 | 2/26/15 | 10.7 | X | 0.12 | 690 | | 38.9 | 0.82 | U | 0.82 | 258 | NX | 5.4 | 0.15 | U | 0.15 | 194 | | 56.0 |
| SPA-7 | J1V4M1 | 2/26/15 | 10.8 | X | 0.11 | 954 | | 37.1 | 0.78 | U | 0.78 | 280 | NX | 5.1 | 0.14 | U | 0.14 | 410 | | 53.4 |
| SPA-8 | J1V4M2 | 2/26/15 | 13.7 | X | 0.12 | 1720 | | 39.4 | 0.83 | U | 0.83 | 611 | NX | 5.4 | 0.15 | U | 0.15 | 202 | | 56.8 |
| SPA-9 | J1V4M3 | 2/26/15 | 12.1 | X | 0.12 | 860 | | 40.2 | 0.84 | U | 0.84 | 259 | NX | 5.6 | 0.16 | U | 0.16 | 225 | | 57.9 |
| SPA-10 | J1V4M4 | 2/26/15 | 11.1 | X | 0.12 | 881 | | 39.1 | 0.82 | U | 0.82 | 300 | NX | 5.4 | 0.15 | U | 0.15 | 215 | | 56.3 |
| SPA-11 | J1V4M5 | 4/2/15 | 7.2 | X | 0.11 | 491 | | 35.9 | 0.75 | U | 0.75 | 198 | | 5.0 | 0.14 | U | 0.14 | 265 | | 51.6 |
| SPA-12 | J1V4M6 | 4/2/15 | 11.0 | X | 0.11 | 1150 | | 36.8 | 0.77 | U | 0.77 | 288 | | 5.1 | 0.14 | B | 0.14 | 265 | | 53.0 |
| SPA-13 | J1V4M7 | 2/26/15 | 13.6 | X | 0.12 | 2020 | | 40.1 | 0.84 | U | 0.84 | 471 | NX | 5.5 | 0.16 | U | 0.16 | 199 | | 57.7 |
| SPA-14 | J1V4M8 | 2/26/15 | 11.8 | X | 0.12 | 1060 | | 38.5 | 0.81 | U | 0.81 | 320 | NX | 5.3 | 0.15 | U | 0.15 | 220 | | 55.4 |
| SPA-15 | J1V4M9 | 4/2/15 | 14.1 | X | 0.12 | 1480 | | 39.5 | 0.83 | U | 0.83 | 324 | | 5.5 | 0.15 | U | 0.15 | 325 | | 56.9 |
| OVB-9[a] | J1V4N1 | 2/26/15 | 10.6 | X | 0.11 | 784 | | 38.3 | 0.80 | U | 0.80 | 218 | N | 5.3 | 0.15 | U | 0.15 | 197 | | 55.1 |
| Duplicate of J1V4N1[a] | J1V4N3 | 2/26/15 | 9.5 | X | 0.12 | 732 | | 38.8 | 0.81 | U | 0.81 | 263 | N | 5.4 | 0.15 | U | 0.15 | 192 | | 55.8 |
| OVB-1 | J1V255 | 12/10/14 | 7.8 | MN | 0.12 | 826 | | 41.1 | 0.86 | U | 0.86 | 216 | | 5.7 | 0.16 | U | 0.16 | 220 | | 59.1 |
| OVB-2 | J1V256 | 12/10/14 | 12.9 | | 0.12 | 1000 | | 40.2 | 0.84 | U | 0.84 | 267 | | 5.6 | 0.16 | U | 0.16 | 227 | | 57.9 |
| OVB-3 | J1V257 | 12/10/14 | 10.0 | | 0.12 | 873 | | 41.1 | 0.86 | U | 0.86 | 240 | | 5.7 | 0.16 | U | 0.16 | 241 | | 59.1 |
| OVB-4 | J1V258 | 12/10/14 | 10.1 | | 0.11 | 713 | | 37.7 | 0.79 | U | 0.79 | 206 | | 5.2 | 0.15 | U | 0.15 | 187 | | 54.3 |
| OVB-5 | J1V259 | 12/10/14 | 11.7 | | 0.12 | 836 | | 39.9 | 0.84 | U | 0.84 | 236 | | 5.5 | 0.16 | U | 0.16 | 198 | | 57.4 |
| OVB-6 | J1V260 | 12/10/14 | 11.0 | | 0.12 | 1050 | | 40.7 | 0.85 | U | 0.85 | 283 | | 5.6 | 0.16 | U | 0.16 | 198 | | 58.6 |
| OVB-7 | J1V261 | 12/10/14 | 12.4 | | 0.11 | 852 | | 37.5 | 0.79 | U | 0.79 | 238 | | 5.2 | 0.15 | U | 0.15 | 198 | | 54.0 |
| OVB-8 | J1V262 | 12/10/14 | 8.6 | | 0.11 | 776 | | 37.6 | 0.79 | U | 0.79 | 226 | | 5.2 | 0.15 | U | 0.15 | 170 | | 54.0 |
| OVB-10 | J1V264 | 12/10/14 | 8.9 | | 0.13 | 917 | | 42.1 | 0.88 | U | 0.88 | 287 | | 5.8 | 0.16 | U | 0.16 | 218 | | 60.6 |
| OVB-11 | J1V265 | 12/10/14 | 9.2 | | 0.12 | 830 | | 40.6 | 0.85 | U | 0.85 | 239 | | 5.6 | 0.16 | U | 0.16 | 202 | | 58.5 |
| OVB-12[a] | J1V4N2 | 2/26/15 | 11.2 | X | 0.12 | 833 | | 39.8 | 0.84 | U | 0.84 | 249 | N | 5.5 | 0.22 | | 0.16 | 197 | | 57.3 |
| OVB-9 | J1V263 | 12/10/14 | 12.2 | | 0.13 | 1100 | | 44.9 | 0.94 | U | 0.94 | 331 | | 6.2 | 0.18 | U | 0.18 | 202 | | 64.7 |
| Duplicate of J1V263 | J1V267 | 12/10/14 | 11.8 | | 0.13 | 1000 | | 42.0 | 0.88 | U | 0.88 | 291 | | 5.8 | 0.16 | U | 0.16 | 234 | | 60.5 |
| OVB-12 | J1V266 | 12/10/14 | 8.7 | | 0.13 | 823 | | 43.1 | 0.90 | U | 0.90 | 265 | | 6.0 | 0.17 | U | 0.17 | 220 | | 62.1 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 13 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Metals).**

| ample Locatio | HEIS Number | Sample Date | Vanadium | | | Zinc | | |
|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL |
| SPA-1 | J1V4L5 | 2/26/15 | 39.3 | | 0.083 | 36.3 | X | 0.35 |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 34.0 | | 0.088 | 34.3 | X | 0.37 |
| SPA-2 | J1V4L6 | 2/26/15 | 47.4 | | 0.088 | 37.2 | X | 0.37 |
| SPA-3 | J1V4L7 | 2/26/15 | 39.9 | | 0.085 | 33.7 | X | 0.36 |
| SPA-4 | J1V4L8 | 2/26/15 | 41.2 | | 0.088 | 35.9 | X | 0.37 |
| SPA-5 | J1V4L9 | 2/26/15 | 39.2 | | 0.083 | 31.6 | X | 0.35 |
| SPA-6 | J1V4M0 | 2/26/15 | 41.5 | | 0.089 | 31.4 | X | 0.38 |
| SPA-7 | J1V4M1 | 2/26/15 | 44.8 | | 0.085 | 35.9 | X | 0.36 |
| SPA-8 | J1V4M2 | 2/26/15 | 43.5 | | 0.090 | 40.6 | X | 0.38 |
| SPA-9 | J1V4M3 | 2/26/15 | 40.2 | | 0.092 | 32.4 | X | 0.39 |
| SPA-10 | J1V4M4 | 2/26/15 | 40.8 | | 0.090 | 32.6 | X | 0.38 |
| SPA-11 | J1V4M5 | 4/2/15 | 46.8 | X | 0.082 | 28.3 | X | 0.35 |
| SPA-12 | J1V4M6 | 4/2/15 | 40.3 | X | 0.084 | 34.6 | X | 0.36 |
| SPA-13 | J1V4M7 | 2/26/15 | 44.9 | | 0.092 | 50.6 | X | 0.39 |
| SPA-14 | J1V4M8 | 2/26/15 | 39.9 | | 0.088 | 35.2 | X | 0.37 |
| SPA-15 | J1V4M9 | 4/2/15 | 41.8 | X | 0.091 | 41.0 | X | 0.38 |
| OVB-9[a] | J1V4N1 | 2/26/15 | 41.2 | | 0.088 | 32.6 | X | 0.37 |
| Duplicate of J1V4N1[a] | J1V4N3 | 2/26/15 | 39.6 | | 0.089 | 30.5 | X | 0.38 |
| OVB-1 | J1V255 | 12/10/14 | 31.9 | | 0.094 | 28.4 | | 0.40 |
| OVB-2 | J1V256 | 12/10/14 | 42.8 | | 0.092 | 39.9 | | 0.39 |
| OVB-3 | J1V257 | 12/10/14 | 39.6 | | 0.094 | 35.4 | | 0.40 |
| OVB-4 | J1V258 | 12/10/14 | 39.8 | | 0.087 | 36.3 | | 0.37 |
| OVB-5 | J1V259 | 12/10/14 | 41.7 | | 0.091 | 34.2 | | 0.39 |
| OVB-6 | J1V260 | 12/10/14 | 43.8 | | 0.093 | 38.6 | | 0.40 |
| OVB-7 | J1V261 | 12/10/14 | 39.8 | | 0.086 | 35.9 | | 0.36 |
| OVB-8 | J1V262 | 12/10/14 | 33.0 | | 0.086 | 28.6 | | 0.36 |
| OVB-10 | J1V264 | 12/10/14 | 43.2 | | 0.097 | 34.9 | | 0.41 |
| OVB-11 | J1V265 | 12/10/14 | 40.1 | | 0.093 | 33.9 | | 0.39 |
| OVB-12[a] | J1V4N2 | 2/26/15 | 45.9 | | 0.091 | 36.1 | X | 0.39 |
| OVB-9 | J1V263 | 12/10/14 | 42.0 | | 0.10 | 38.3 | | 0.44 |
| Duplicate of J1V263 | J1V267 | 12/10/14 | 39.1 | | 0.096 | 37.0 | | 0.41 |
| OVB-12 | J1V266 | 12/10/14 | 42.1 | | 0.099 | 37.6 | | 0.42 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 14 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

## Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Metals).

| Sample Location | HEIS Number | Sample Date | Aluminum | | | Antimony | | | Arsenic | | | Barium | | | Beryllium | | | Boron | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| FS-1 | J1V281 | 12/15/14 | 8890 | X | 1.5 | 0.36 | UJ | 0.36 | 6.2 | J | 0.63 | 75.4 | | 0.073 | 0.064 | B | 0.032 | 3.6 | | 0.94 |
| FS-2 | J1V282 | 12/15/14 | 3640 | X | 1.5 | 0.36 | UJ | 0.36 | 1.5 | J | 0.63 | 29.6 | | 0.072 | 0.031 | U | 0.031 | 0.93 | U | 0.93 |
| FS-3 | J1V283 | 12/15/14 | 9790 | X | 1.4 | 0.35 | UJ | 0.35 | 4.5 | J | 0.61 | 87.6 | | 0.071 | 0.11 | B | 0.031 | 3.6 | | 0.91 |
| FS-4 | J1V284 | 12/15/14 | 5190 | X | 1.5 | 0.38 | UJ | 0.38 | 4.0 | J | 0.66 | 40.1 | | 0.075 | 0.033 | U | 0.033 | 0.97 | U | 0.97 |
| RC-1 | J1TF83 | 2/26/14 | 5140 | | 1.4 | 0.35 | U | 0.35 | 2.7 | | 0.60 | 36.4 | | 0.069 | 0.076 | B | 0.030 | 0.89 | U | 0.89 |
| RC-2 | J1TF82 | 2/26/14 | 9890 | | 1.7 | 0.42 | U | 0.42 | 7.3 | | 0.73 | 88.0 | | 0.083 | 0.27 | | 0.036 | 1.5 | B | 1.1 |
| RC-3 | J1T5W6 | 11/18/13 | 7730 | | 1.4 | 0.40 | B | 0.33 | 6.6 | | 0.58 | 87.9 | | 0.067 | 0.14 | B | 0.029 | 2.4 | M | 0.86 |
| Equipment blank 2 | J1V4N4 | 2/26/15 | 112 | | 1.5 | 0.37 | U | 0.37 | 0.65 | U | 0.65 | 1.5 | | 0.075 | 0.032 | U | 0.032 | 0.96 | U | 0.96 |
| Equipment blank 3 | J1V544 | 3/16/15 | 165 | | 1.4 | 0.34 | U | 0.34 | 0.60 | B | 0.59 | 1.7 | | 0.068 | 0.071 | B | 0.029 | 0.88 | U | 0.88 |

| Sample Location | HEIS Number | Sample Date | Cadmium | | | Calcium | | | Chromium | | | Cobalt | | | Copper | | | Hexavalent Chromium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| FS-1 | J1V281 | 12/15/14 | 0.11 | B | 0.039 | 7880 | X | 13.5 | 17.3 | | 0.056 | 6.1 | X | 0.096 | 13.8 | | 0.21 | 0.155 | U | 0.155 |
| FS-2 | J1V282 | 12/15/14 | 0.10 | B | 0.039 | 3560 | X | 13.4 | 7.1 | | 0.055 | 5.5 | X | 0.095 | 12.4 | | 0.21 | 0.193 | | 0.155 |
| FS-3 | J1V283 | 12/15/14 | 0.15 | B | 0.038 | 9220 | X | 13.1 | 18.2 | | 0.054 | 6.5 | X | 0.093 | 14.2 | | 0.20 | 0.155 | U | 0.155 |
| FS-4 | J1V284 | 12/15/14 | 0.066 | B | 0.041 | 4450 | X | 14.0 | 8.7 | | 0.058 | 5.1 | X | 0.099 | 11.5 | | 0.22 | 0.196 | | 0.155 |
| RC-1 | J1TF83 | 2/26/14 | 0.12 | BC | 0.037 | 3920 | | 12.8 | 10.4 | | 0.053 | 4.9 | X | 0.091 | 12.8 | M | 0.20 | 0.184 | | 0.155 |
| RC-2 | J1TF82 | 2/26/14 | 0.25 | | 0.045 | 6710 | | 15.5 | 21.2 | | 0.064 | 7.0 | X | 0.11 | 18.7 | | 0.24 | 0.212 | | 0.155 |
| RC-3 | J1T5W6 | 11/18/13 | 0.16 | B | 0.036 | 6160 | | 12.4 | 13.5 | | 0.051 | 6.2 | | 0.088 | 15.0 | | 0.19 | 0.185 | | 0.155 |
| Equipment blank 2 | J1V4N4 | 2/26/15 | 0.040 | U | 0.040 | 36.1 | BC | 13.8 | 0.14 | BCX | 0.057 | 0.098 | UX | 0.098 | 0.21 | U | 0.21 | | | |
| Equipment blank 3 | J1V544 | 3/16/15 | 0.037 | U | 0.037 | 35.5 | BCX | 13.6 | 0.19 | | 0.052 | 0.16 | BX | 0.089 | 0.45 | BC | 0.21 | | | |

| Sample Location | HEIS Number | Sample Date | Iron | | | Lead | | | Magnesium | | | Manganese | | | Mercury | | | Molybdenum | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| FS-1 | J1V281 | 12/15/14 | 16600 | | 3.6 | 10.4 | XJ | 0.26 | 5210 | X | 3.5 | 257 | X | 0.096 | 0.073 | | 0.0060 | 0.25 | U | 0.25 |
| FS-2 | J1V282 | 12/15/14 | 12400 | | 3.6 | 2.1 | XJ | 0.26 | 2640 | X | 3.5 | 149 | X | 0.095 | 0.0055 | U | 0.0055 | 0.25 | U | 0.25 |
| FS-3 | J1V283 | 12/15/14 | 17400 | | 3.5 | 6.6 | XJ | 0.25 | 6140 | X | 3.4 | 259 | X | 0.093 | 4.9 | | 0.059 | 0.24 | U | 0.24 |
| FS-4 | J1V284 | 12/15/14 | 13900 | | 3.8 | 4.2 | XJ | 0.27 | 3470 | X | 3.7 | 208 | X | 0.099 | 0.0088 | B | 0.0056 | 0.26 | U | 0.26 |
| RC-1 | J1TF83 | 2/26/14 | 12800 | | 3.5 | 2.6 | | 0.25 | 4070 | | 3.4 | 214 | | 0.091 | 0.011 | B | 0.0059 | 0.24 | U | 0.24 |
| RC-2 | J1TF82 | 2/26/14 | 17500 | | 4.2 | 9.5 | | 0.30 | 6360 | | 4.1 | 313 | | 0.11 | 0.028 | M | 0.0071 | 0.29 | U | 0.29 |
| RC-3 | J1T5W6 | 11/18/13 | 16200 | | 3.3 | 21.1 | X | 0.24 | 5070 | | 3.3 | 261 | | 0.088 | 0.0050 | U | 0.0050 | 0.23 | U | 0.23 |
| Equipment blank 2 | J1V4N4 | 2/26/15 | 151 | | 3.7 | 0.38 | BX | 0.26 | 19.0 | BCX | 3.6 | 2.9 | X | 0.098 | 0.0061 | U | 0.0061 | 0.25 | U | 0.25 |
| Equipment blank 3 | J1V544 | 3/16/15 | 195 | X | 3.7 | 0.34 | B | 0.24 | 18.3 | BC | 3.6 | 4.6 | | 0.089 | 0.0057 | U | 0.0057 | 0.23 | U | 0.23 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 15 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

## Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Metals).

| ample Locatio | HEIS Number | Sample Date | Nickel | | | Potassium | | | Selenium | | | Silicon | | | Silver | | | Sodium | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| FS-1 | J1V281 | 12/15/14 | 14.4 | X | 0.12 | 1440 | | 39.2 | 0.82 | U | 0.82 | 226 | NJ | 5.4 | 0.15 | U | 0.15 | 284 | | 56.5 |
| FS-2 | J1V282 | 12/15/14 | 7.2 | X | 0.12 | 425 | | 39.0 | 0.82 | U | 0.82 | 92.5 | NJ | 5.4 | 0.15 | U | 0.15 | 195 | | 56.2 |
| FS-3 | J1V283 | 12/15/14 | 15.8 | X | 0.11 | 1660 | | 38.1 | 0.80 | U | 0.80 | 199 | NJ | 5.3 | 0.15 | U | 0.15 | 368 | | 54.8 |
| FS-4 | J1V284 | 12/15/14 | 8.6 | X | 0.12 | 620 | | 40.7 | 0.85 | U | 0.85 | 134 | NJ | 5.6 | 0.16 | U | 0.16 | 200 | | 58.6 |
| RC-1 | J1TF83 | 2/26/14 | 10.3 | | 0.11 | 559 | | 37.3 | 0.78 | U | 0.78 | 182 | | 5.1 | 0.15 | U | 0.15 | 163 | | 53.7 |
| RC-2 | J1TF82 | 2/26/14 | 17.9 | | 0.14 | 1640 | | 45.0 | 0.94 | U | 0.94 | 406 | | 6.2 | 0.18 | U | 0.18 | 265 | | 64.8 |
| RC-3 | J1T5W6 | 11/18/13 | 13.0 | | 0.11 | 1190 | | 36.1 | 0.76 | U | 0.76 | 221 | N | 5.0 | 0.14 | U | 0.14 | 231 | | 51.9 |
| Equipment blank 2 | J1V4N4 | 2/26/15 | 0.12 | UX | 0.12 | 40.2 | U | 40.2 | 0.84 | U | 0.84 | 83.4 | N | 5.5 | 0.16 | U | 0.16 | 57.8 | U | 57.8 |
| Equipment blank 3 | J1V544 | 3/16/15 | 0.41 | BX | 0.11 | 47.2 | B | 36.6 | 0.77 | U | 0.77 | 70.4 | N | 5.4 | 0.14 | U | 0.14 | 52.7 | U | 52.7 |

| ample Locatio | HEIS Number | Sample Date | Vanadium | | | Zinc | | |
|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL |
| FS-1 | J1V281 | 12/15/14 | 32.9 | | 0.090 | 40.2 | X | 0.38 |
| FS-2 | J1V282 | 12/15/14 | 34.6 | | 0.089 | 23.9 | X | 0.38 |
| FS-3 | J1V283 | 12/15/14 | 33.4 | | 0.087 | 42.2 | X | 0.37 |
| FS-4 | J1V284 | 12/15/14 | 35.5 | | 0.093 | 27.9 | X | 0.40 |
| RC-1 | J1TF83 | 2/26/14 | 34.5 | | 0.086 | 29.6 | X | 0.36 |
| RC-2 | J1TF82 | 2/26/14 | 37.4 | | 0.10 | 50.2 | X | 0.44 |
| RC-3 | J1T5W6 | 11/18/13 | 34.7 | | 0.083 | 46.4 | | 0.35 |
| Equipment blank 2 | J1V4N4 | 2/26/15 | 0.26 | B | 0.092 | 0.50 | BX | 0.39 |
| Equipment blank 3 | J1V544 | 3/16/15 | 0.63 | B | 0.084 | 1.3 | | 0.36 |

| Sample Location | HEIS Number | Sample Date | Arsenic TCLP | | | Barium TCLP | | | Cadmium TCLP | | | Chromium TCLP | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL |
| EXC1-1 | J1V269 | 12/15/14 | 0.59 | UJ | 0.022 | 0.56 | B | 0.002 | 0.0025 | B | 0.002 | 0.0048 | B | 0.003 |
| FS-3 | J1V283 | 12/15/14 | 0.053 | BC | 0.022 | 0.66 | B | 0.002 | 0.0039 | B | 0.002 | 0.003 | B | 0.003 |
| SPA-13 | J1V4M7 | 2/26/15 | 0.68 | | 0.022 | 0.35 | BX | 0.002 | 0.002 | U | 0.002 | 0.0034 | BCM | 0.003 |

| Sample Location | HEIS Number | Sample Date | Lead TCLP | | | Mercury TCLP | | | Selenium TCLP | | | Silver TCLP | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL | mg/L | Q | PQL |
| EXC1-1 | J1V269 | 12/15/14 | 0.37 | B | 0.013 | 0.0001 | BCM | 3E-05 | 0.024 | U | 0.024 | 0.004 | U | 0.004 |
| FS-3 | J1V283 | 12/15/14 | 0.1 | B | 0.013 | 0.003 | | 3E-05 | 0.024 | U | 0.024 | 0.004 | U | 0.004 |
| SPA-13 | J1V4M7 | 2/26/15 | 0.18 | B | 0.013 | | | | 0.024 | U | 0.024 | 0.004 | U | 0.004 |

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| Attachment | 1 | Sheet No. | 16 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

## Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (IC Anions).

| Sample Location | HEIS Number | Sample Date | Bromide | | | Chloride | | | Fluoride | | | Nitrogen in Nitrate | | | Nitrogen in Nitrite and Nitrate | | | Nitrogen in Nitrite | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| EXC1-4 | J1V272 | 12/15/14 | 0.42 | U | 0.42 | 2.2 | U | 2.2 | 1.6 | B | 0.89 | 0.88 | BJ | 0.34 | 0.39 | U | 0.39 | 0.36 | UJ | 0.36 |
| Duplicate of J1V272 | J1V285 | 12/15/14 | 0.42 | U | 0.42 | 2.2 | U | 2.2 | 1.5 | B | 0.88 | 1.1 | BJ | 0.34 | 0.38 | U | 0.38 | 0.36 | UJ | 0.36 |
| EXC1-1[a] | J1V543 | 3/16/15 | 0.39 | U | 0.39 | 30.1 | C | 2.0 | 1.3 | B | 0.82 | 3.1 | J | 0.31 | 2.9 | | 0.37 | 0.34 | UR | 0.34 |
| EXC1-2 | J1V270 | 12/15/14 | 0.40 | U | 0.40 | 2.0 | U | 2.0 | 1.2 | B | 0.84 | 0.83 | BJ | 0.32 | 0.37 | U | 0.37 | 0.34 | UJ | 0.34 |
| EXC1-3 | J1V271 | 12/15/14 | 0.39 | U | 0.39 | 2.0 | U | 2.0 | 0.83 | U | 0.83 | 0.32 | UJ | 0.32 | 0.36 | U | 0.36 | 0.34 | UJ | 0.34 |
| EXC1-5 | J1V273 | 12/15/14 | 0.39 | U | 0.39 | 2.0 | U | 2.0 | 0.81 | U | 0.81 | 0.31 | UJ | 0.31 | 0.37 | U | 0.37 | 0.33 | UJ | 0.33 |
| EXC1-6 | J1V274 | 12/15/14 | 0.39 | U | 0.39 | 2.0 | U | 2.0 | 0.84 | B | 0.81 | 0.71 | BJ | 0.31 | 0.37 | U | 0.37 | 0.33 | UJ | 0.33 |
| EXC1-7 | J1V275 | 12/15/14 | 0.39 | U | 0.39 | 2.0 | U | 2.0 | 0.82 | U | 0.82 | 0.76 | BJ | 0.32 | 0.37 | U | 0.37 | 0.34 | UJ | 0.34 |
| EXC1-8 | J1V276 | 12/15/14 | 0.42 | U | 0.42 | 2.2 | U | 2.2 | 1.4 | B | 0.89 | 1.2 | BJ | 0.34 | 0.39 | U | 0.39 | 0.37 | UJ | 0.37 |
| EXC1-9 | J1V277 | 12/15/14 | 0.40 | U | 0.40 | 2.0 | U | 2.0 | 0.87 | B | 0.84 | 0.32 | UJ | 0.32 | 0.37 | U | 0.37 | 0.34 | UJ | 0.34 |
| EXC1-10 | J1V278 | 12/15/14 | 0.43 | U | 0.43 | 2.2 | U | 2.2 | 0.95 | B | 0.90 | 0.34 | UJ | 0.34 | 0.40 | U | 0.40 | 0.37 | UJ | 0.37 |
| EXC1-11 | J1V279 | 12/15/14 | 0.39 | U | 0.39 | 2.0 | U | 2.0 | 0.83 | U | 0.83 | 0.70 | BJ | 0.32 | 0.36 | U | 0.36 | 0.34 | UJ | 0.34 |
| EXC1-12 | J1V280 | 12/15/14 | 0.40 | U | 0.40 | 2.0 | U | 2.0 | 0.83 | U | 0.83 | 1.1 | BJ | 0.32 | 0.63 | B | 0.37 | 0.34 | UJ | 0.34 |
| EXC2-7 | J1V292 | 12/12/14 | 0.40 | U | 0.40 | 2.1 | U | 2.1 | 1.0 | B | 0.84 | 0.85 | BJ | 0.32 | 0.36 | B | 0.36 | 0.34 | UR | 0.34 |
| Duplicate of J1V292 | J1V298 | 12/12/14 | 0.39 | U | 0.39 | 2.0 | U | 2.0 | 1.1 | B | 0.81 | 0.86 | BJ | 0.31 | 0.37 | U | 0.37 | 0.33 | UR | 0.33 |
| EXC2-1 | J1V286 | 12/12/14 | 0.38 | U | 0.38 | 1.9 | U | 1.9 | 0.80 | U | 0.80 | 0.31 | UR | 0.31 | 0.36 | U | 0.36 | 0.33 | UR | 0.33 |
| EXC2-2 | J1V287 | 12/12/14 | 0.38 | U | 0.38 | 1.9 | U | 1.9 | 0.79 | U | 0.79 | 0.30 | UR | 0.30 | 0.37 | U | 0.37 | 0.32 | UR | 0.32 |
| EXC2-3 | J1V288 | 12/12/14 | 0.37 | U | 0.37 | 1.9 | U | 1.9 | 1.1 | B | 0.79 | 2.1 | BJ | 0.30 | 1.8 | | 0.37 | 0.32 | UR | 0.32 |
| EXC2-4 | J1V289 | 12/12/14 | 0.37 | U | 0.37 | 1.9 | U | 1.9 | 0.78 | U | 0.78 | 1.3 | BJ | 0.30 | 0.77 | | 0.36 | 0.32 | UR | 0.32 |
| EXC2-5 | J1V290 | 12/12/14 | 0.38 | U | 0.38 | 2.0 | U | 2.0 | 0.81 | U | 0.81 | 0.31 | UR | 0.31 | 0.37 | U | 0.37 | 0.33 | UR | 0.33 |
| EXC2-6 | J1V291 | 12/12/14 | 0.41 | U | 0.41 | 2.1 | U | 2.1 | 0.92 | B | 0.86 | 0.97 | BJ | 0.33 | 0.38 | U | 0.38 | 0.35 | UR | 0.35 |
| EXC2-8 | J1V293 | 12/12/14 | 0.40 | U | 0.40 | 2.1 | U | 2.1 | 0.87 | B | 0.84 | 0.76 | BJ | 0.32 | 0.36 | U | 0.36 | 0.35 | UR | 0.35 |
| EXC2-9 | J1V294 | 12/12/14 | 0.41 | U | 0.41 | 2.1 | U | 2.1 | 1.1 | B | 0.85 | 0.88 | BJ | 0.33 | 0.42 | B | 0.37 | 0.35 | UR | 0.35 |
| EXC2-10 | J1V295 | 12/12/14 | 0.38 | U | 0.38 | 1.9 | U | 1.9 | 0.80 | U | 0.80 | 0.63 | BJ | 0.30 | 0.36 | U | 0.36 | 0.33 | UR | 0.33 |
| EXC2-11 | J1V296 | 12/12/14 | 0.39 | U | 0.39 | 2.0 | U | 2.0 | 0.82 | U | 0.82 | 0.72 | BJ | 0.32 | 0.36 | U | 0.36 | 0.34 | UR | 0.34 |
| EXC2-12 | J1V297 | 12/12/14 | 0.41 | U | 0.41 | 2.1 | U | 2.1 | 1.0 | B | 0.86 | 1.4 | BJ | 0.33 | 0.95 | | 0.37 | 0.35 | UR | 0.35 |
| EXC1-1 | J1V269 | 12/15/14 | 0.41 | U | 0.41 | 12.8 | | 2.1 | 1.6 | B | 0.86 | 2.1 | BJ | 0.33 | 1.4 | | 0.39 | 0.98 | BJ | 0.35 |

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| Attachment | 1 | Sheet No. | 17 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (IC Anions, TPH, % Moisture and pH).**

| Sample Location | HEIS Number | Sample Date | Phosphorous in phosphate | | | Sulfate | | | TPH-Diesel Ext. | | | TPH-Diesel | | | % moisture (wet sample) | | | pH Measurement | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | % | Q | PQL | pH | Q | PQL |
| EXC1-4 | J1V272 | 12/15/14 | 2.4 | BJ | 1.3 | 13.2 | | 1.8 | 2900 | J | 1100 | 1300 | J | 730 | 8.3 | | 0.10 | 9.74 | J | 0.100 |
| Duplicate of J1V272 | J1V285 | 12/15/14 | 2.6 | BJ | 1.3 | 13.8 | | 1.8 | 3400 | J | 1000 | 1800 | J | 710 | 7.7 | | 0.10 | 9.36 | J | 0.100 |
| EXC1-1[a] | J1V543 | 3/16/15 | 1.2 | U | 1.2 | 13.4 | | 1.7 | 7400 | | 1000 | 4600 | | 700 | 4.1 | | 0.10 | 8.93 | | 0.100 |
| EXC1-2 | J1V270 | 12/15/14 | 1.3 | UJ | 1.3 | 17.2 | | 1.7 | 78000 | NJ | 990 | 33000 | N | 680 | 4.6 | | 0.10 | 9.07 | J | 0.100 |
| EXC1-3 | J1V271 | 12/15/14 | 1.2 | UJ | 1.2 | 8.2 | | 1.7 | 1200 | J | 1000 | 690 | J | 690 | 1.8 | | 0.10 | 9.16 | J | 0.100 |
| EXC1-5 | J1V273 | 12/15/14 | 1.2 | UJ | 1.2 | 7.9 | | 1.7 | 3000 | J | 1000 | 2200 | J | 680 | 3.0 | | 0.10 | 9.42 | J | 0.100 |
| EXC1-6 | J1V274 | 12/15/14 | 1.2 | UJ | 1.2 | 8.9 | | 1.7 | 2500 | J | 980 | 1500 | J | 670 | 3.0 | | 0.10 | 8.95 | J | 0.100 |
| EXC1-7 | J1V275 | 12/15/14 | 1.2 | UJ | 1.2 | 7.8 | | 1.7 | 1500 | J | 940 | 800 | J | 640 | 2.2 | | 0.10 | 9.16 | J | 0.100 |
| EXC1-8 | J1V276 | 12/15/14 | 1.3 | UJ | 1.3 | 17.9 | | 1.8 | 7300 | J | 1100 | 3400 | J | 730 | 8.8 | | 0.10 | 9.09 | J | 0.100 |
| EXC1-9 | J1V277 | 12/15/14 | 1.3 | UJ | 1.3 | 18.9 | | 1.7 | 8300 | J | 970 | 3000 | J | 660 | 3.1 | | 0.10 | 9.15 | J | 0.100 |
| EXC1-10 | J1V278 | 12/15/14 | 1.4 | UJ | 1.4 | 14.8 | | 1.9 | 6300 | J | 1100 | 2500 | J | 730 | 10 | | 0.10 | 8.87 | J | 0.100 |
| EXC1-11 | J1V279 | 12/15/14 | 1.3 | UJ | 1.3 | 10.1 | | 1.7 | 2300 | J | 1000 | 1600 | J | 680 | 2.3 | | 0.10 | 9.24 | J | 0.100 |
| EXC1-12 | J1V280 | 12/15/14 | 1.3 | UJ | 1.3 | 58.7 | | 1.7 | 7700 | J | 1000 | 4000 | J | 690 | 4.6 | | 0.10 | 9.68 | J | 0.100 |
| EXC2-7 | J1V292 | 12/12/14 | 1.3 | UR | 1.3 | 9.6 | | 1.7 | 1900 | J | 1000 | 970 | J | 700 | 3.9 | | 0.10 | 9.18 | | 0.100 |
| Duplicate of J1V292 | J1V298 | 12/12/14 | 1.9 | BJ | 1.2 | 8.6 | | 1.7 | 1300 | J | 1000 | 680 | U | 680 | 4.0 | | 0.10 | 9.16 | | 0.100 |
| EXC2-1 | J1V286 | 12/12/14 | 1.2 | UR | 1.2 | 6.9 | | 1.7 | 1000 | U | 1000 | 690 | U | 690 | 2.6 | | 0.10 | 9.09 | | 0.100 |
| EXC2-2 | J1V287 | 12/12/14 | 1.2 | UR | 1.2 | 6.3 | | 1.6 | 1000 | U | 1000 | 700 | U | 700 | 4.0 | | 0.10 | 8.42 | | 0.100 |
| EXC2-3 | J1V288 | 12/12/14 | 1.2 | UR | 1.2 | 23.9 | | 1.6 | 4600 | | 1000 | 3100 | J | 680 | 4.1 | | 0.10 | 8.90 | | 0.100 |
| EXC2-4 | J1V289 | 12/12/14 | 1.2 | UR | 1.2 | 6.6 | | 1.6 | 950 | U | 950 | 640 | U | 640 | 2.6 | | 0.10 | 9.02 | | 0.100 |
| EXC2-5 | J1V290 | 12/12/14 | 1.2 | UR | 1.2 | 7.2 | | 1.7 | 950 | U | 950 | 650 | U | 650 | 2.6 | | 0.10 | 8.63 | | 0.100 |
| EXC2-6 | J1V291 | 12/12/14 | 1.3 | UR | 1.3 | 11.3 | | 1.8 | 2500 | J | 1000 | 1900 | J | 700 | 7.4 | | 0.10 | 9.03 | | 0.100 |
| EXC2-8 | J1V293 | 12/12/14 | 1.3 | UR | 1.3 | 8.6 | | 1.7 | 990 | U | 990 | 670 | U | 670 | 3.7 | | 0.10 | 9.25 | | 0.100 |
| EXC2-9 | J1V294 | 12/12/14 | 2.1 | BJ | 1.3 | 10.2 | | 1.8 | 2900 | J | 1000 | 1900 | J | 690 | 5.1 | | 0.10 | 8.87 | | 0.100 |
| EXC2-10 | J1V295 | 12/12/14 | 1.2 | UR | 1.2 | 6.9 | | 1.7 | 930 | U | 930 | 630 | U | 630 | 2.7 | | 0.10 | 8.60 | | 0.100 |
| EXC2-11 | J1V296 | 12/12/14 | 1.2 | UR | 1.2 | 7.8 | | 1.7 | 950 | U | 950 | 640 | U | 640 | 2.5 | | 0.10 | 9.14 | | 0.100 |
| EXC2-12 | J1V297 | 12/12/14 | 2.2 | BJ | 1.3 | 9.2 | | 1.8 | 3200 | JN | 1000 | 1100 | JN | 690 | 5.1 | | 0.10 | 8.99 | | 0.100 |
| EXC1-1 | J1V269 | 12/15/14 | 2.8 | BJ | 1.3 | 12.1 | | 1.8 | 7200 | | 1100 | 4300 | | 720 | 8.2 | | 0.10 | 8.83 | | 0.100 |
| Equipment blank 1 | J1V268 | 12/10/14 | | | | | | | | | | | | | 0.1 | U | 0.10 | | | |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 18 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (IC Anions).**

| Sample Location | HEIS Number | Sample Date | Bromide | | | Chloride | | | Fluoride | | | Nitrogen in Nitrate | | | Nitrogen in Nitrite and Nitrate | | | Nitrogen in Nitrite | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| SPA-1 | J1V4L5 | 2/26/15 | 0.39 | U | 0.39 | 7.6 | C | 2.0 | 0.99 | B | 0.82 | 0.79 | BJ | 0.31 | 0.37 | U | 0.37 | 0.34 | UR | 0.34 |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 0.40 | U | 0.40 | 7.2 | C | 2.0 | 0.98 | B | 0.84 | 0.32 | UR | 0.32 | 0.36 | U | 0.36 | 0.34 | UR | 0.34 |
| SPA-2 | J1V4L6 | 2/26/15 | 0.38 | U | 0.38 | 10.0 | CM | 2.0 | 0.94 | B | 0.81 | 1.7 | BMJ | 0.31 | 0.55 | B | 0.36 | 0.33 | UR | 0.33 |
| SPA-3 | J1V4L7 | 2/26/15 | 0.38 | U | 0.38 | 7.4 | C | 2.0 | 0.96 | B | 0.80 | 0.82 | BJ | 0.31 | 0.37 | U | 0.37 | 0.33 | UR | 0.33 |
| SPA-4 | J1V4L8 | 2/26/15 | 0.39 | U | 0.39 | 7.9 | C | 2.0 | 1.1 | B | 0.82 | 1.1 | BJ | 0.31 | 0.36 | U | 0.36 | 0.34 | UR | 0.34 |
| SPA-5 | J1V4L9 | 2/26/15 | 0.38 | U | 0.38 | 6.9 | C | 1.9 | 0.79 | U | 0.79 | 0.97 | BJ | 0.30 | 0.35 | U | 0.35 | 0.32 | UR | 0.32 |
| SPA-6 | J1V4M0 | 2/26/15 | 0.39 | U | 0.39 | 7.1 | C | 2.0 | 0.93 | B | 0.82 | 0.32 | UR | 0.32 | 0.35 | U | 0.35 | 0.34 | UR | 0.34 |
| SPA-7 | J1V4M1 | 2/26/15 | 0.39 | U | 0.39 | 9.7 | C | 2.0 | 1.1 | B | 0.83 | 1.8 | BJ | 0.32 | 0.96 | | 0.37 | 0.34 | UR | 0.34 |
| SPA-8 | J1V4M2 | 2/26/15 | 0.41 | U | 0.41 | 8.5 | C | 2.1 | 1.5 | B | 0.86 | 4.7 | J | 0.33 | 4.2 | | 0.37 | 0.35 | UR | 0.35 |
| SPA-9 | J1V4M3 | 2/26/15 | 0.38 | U | 0.38 | 7.9 | C | 2.0 | 1.1 | B | 0.81 | 0.76 | BJ | 0.31 | 0.37 | U | 0.37 | 0.33 | UR | 0.33 |
| SPA-10 | J1V4M4 | 2/26/15 | 0.40 | U | 0.40 | 7.8 | C | 2.0 | 1.1 | B | 0.84 | 1.1 | BJ | 0.32 | 0.37 | U | 0.37 | 0.34 | UR | 0.34 |
| SPA-11 | J1V4M5 | 4/2/15 | 0.39 | U | 0.39 | 7.2 | C | 2.0 | 1.8 | B | 0.82 | 0.95 | BJ | 0.32 | 0.36 | UN | 0.36 | 0.34 | UR | 0.34 |
| SPA-12 | J1V4M6 | 4/2/15 | 0.40 | U | 0.40 | 11.8 | C | 2.1 | 3.0 | B | 0.84 | 7.6 | J | 0.32 | 6.8 | | 0.38 | 0.34 | UR | 0.34 |
| SPA-13 | J1V4M7 | 2/26/15 | 0.41 | U | 0.41 | 8.4 | C | 2.1 | 2.7 | B | 0.85 | 2.6 | J | 0.33 | 1.7 | | 0.38 | 0.35 | UR | 0.35 |
| SPA-14 | J1V4M8 | 2/26/15 | 0.39 | U | 0.39 | 7.0 | C | 2.0 | 1.4 | B | 0.81 | 1.0 | BJ | 0.31 | 0.36 | U | 0.36 | 0.33 | UR | 0.33 |
| SPA-15 | J1V4M9 | 4/2/15 | 0.40 | U | 0.40 | 16.7 | C | 2.0 | 3.3 | B | 0.83 | 15.2 | J | 0.32 | 2.5 | | 0.37 | 0.34 | UR | 0.34 |
| OVB-9[a] | J1V4N1 | 2/26/15 | 0.40 | U | 0.40 | 8.6 | C | 2.0 | 1.1 | B | 0.84 | 1.6 | BJ | 0.32 | 0.54 | B | 0.37 | 0.34 | UR | 0.34 |
| Duplicate of J1V4N1[a] | J1V4N3 | 2/26/15 | 0.39 | U | 0.39 | 8.6 | C | 2.0 | 1.1 | B | 0.82 | 1.5 | BJ | 0.32 | 0.50 | B | 0.37 | 0.34 | UR | 0.34 |
| OVB-1 | J1V255 | 12/10/14 | 0.41 | U | 0.41 | 8.4 | N | 2.1 | 1.0 | B | 0.86 | 0.33 | UR | 0.33 | 0.39 | U | 0.39 | 0.35 | UR | 0.35 |
| OVB-2 | J1V256 | 12/10/14 | 0.41 | U | 0.41 | 27.0 | | 2.1 | 1.1 | B | 0.86 | 0.83 | BJ | 0.33 | 0.39 | U | 0.39 | 0.35 | UR | 0.35 |
| OVB-3 | J1V257 | 12/10/14 | 0.39 | U | 0.39 | 8.9 | | 2.0 | 1.3 | B | 0.83 | 2.6 | J | 0.32 | 2.4 | | 0.38 | 0.34 | UR | 0.34 |
| OVB-4 | J1V258 | 12/10/14 | 0.41 | U | 0.41 | 7.3 | | 2.1 | 0.97 | B | 0.85 | 1.2 | BJ | 0.33 | 0.45 | B | 0.37 | 0.35 | UR | 0.35 |
| OVB-5 | J1V259 | 12/10/14 | 0.39 | U | 0.39 | 7.2 | | 2.0 | 0.88 | B | 0.83 | 0.89 | BJ | 0.32 | 0.39 | U | 0.39 | 0.34 | UR | 0.34 |
| OVB-6 | J1V260 | 12/10/14 | 0.40 | U | 0.40 | 7.2 | | 2.1 | 1.4 | B | 0.85 | 1.0 | BJ | 0.33 | 0.47 | B | 0.38 | 0.35 | UR | 0.35 |
| OVB-7 | J1V261 | 12/10/14 | 0.39 | U | 0.39 | 7.1 | | 2.0 | 1.0 | B | 0.82 | 0.96 | BJ | 0.31 | 0.38 | U | 0.38 | 0.34 | UR | 0.34 |
| OVB-8 | J1V262 | 12/10/14 | 0.39 | U | 0.39 | 10.6 | | 2.0 | 1.2 | B | 0.83 | 1.8 | BJ | 0.32 | 1.5 | | 0.38 | 0.89 | BJ | 0.34 |
| OVB-10 | J1V264 | 12/10/14 | 0.40 | U | 0.40 | 7.2 | | 2.0 | 1.2 | B | 0.83 | 1.2 | BJ | 0.32 | 0.70 | B | 0.38 | 0.34 | UR | 0.34 |
| OVB-11 | J1V265 | 12/10/14 | 0.40 | U | 0.40 | 12.1 | | 2.0 | 1.1 | B | 0.84 | 1.3 | BJ | 0.32 | 1.3 | | 0.38 | 1.5 | BJ | 0.34 |
| OVB-12[a] | J1V4N2 | 2/26/15 | 0.38 | U | 0.38 | 7.6 | C | 2.0 | 1.1 | B | 0.80 | 1.2 | BJ | 0.31 | 0.37 | U | 0.37 | 0.33 | UR | 0.33 |
| OVB-9 | J1V263 | 12/10/14 | 0.41 | U | 0.41 | 8.3 | | 2.1 | 1.5 | B | 0.87 | 0.85 | BJ | 0.33 | 0.39 | U | 0.39 | 0.35 | UR | 0.35 |
| Duplicate of J1V263 | J1V267 | 12/10/14 | 0.42 | U | 0.42 | 8.4 | N | 2.1 | 1.5 | B | 0.88 | 0.97 | BJ | 0.34 | 0.39 | U | 0.39 | 0.36 | UR | 0.36 |
| OVB-12 | J1V266 | 12/10/14 | 0.40 | U | 0.40 | 8.3 | | 2.0 | 1.2 | B | 0.83 | 0.87 | BJ | 0.32 | 0.39 | U | 0.39 | 0.34 | UR | 0.34 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 19 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (IC Anions, TPH, % Moisture and pH).**

| Sample Location | HEIS Number | Sample Date | Phosphorous in phosphate | | | Sulfate | | | TPH-Diesel Ext. | | | TPH-Diesel | | | % moisture (wet sample) | | | pH Measurement | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | % | Q | PQL | pH | Q | PQL |
| SPA-1 | J1V4L5 | 2/26/15 | 1.2 | UR | 1.2 | 6.8 | | 1.7 | 1100 | J | 1000 | 1500 | J | 700 | 3.9 | | 0.01 | 9.20 | | 0.100 |
| Duplicate of J1V4L5 | J1V4N0 | 2/26/15 | 1.3 | UR | 1.3 | 6.8 | | 1.7 | 1000 | U | 1000 | 920 | J | 690 | 3.9 | | 0.01 | 9.29 | | 0.100 |
| SPA-2 | J1V4L6 | 2/26/15 | 2.7 | BJ | 1.2 | 8.8 | | 1.7 | 6800 | | 1000 | 3100 | J | 690 | 2.6 | | 0.01 | 9.16 | | 0.100 |
| SPA-3 | J1V4L7 | 2/26/15 | 1.2 | UR | 1.2 | 7.3 | | 1.7 | 1900 | J | 960 | 1800 | J | 650 | 2.9 | | 0.01 | 9.10 | | 0.100 |
| SPA-4 | J1V4L8 | 2/26/15 | 1.9 | BJ | 1.2 | 8.6 | | 1.7 | 8100 | | 1000 | 5400 | | 690 | 2.8 | | 0.01 | 9.14 | | 0.100 |
| SPA-5 | J1V4L9 | 2/26/15 | 1.2 | UR | 1.2 | 6.3 | | 1.6 | 3500 | J | 990 | 2300 | J | 680 | 2.0 | | 0.01 | 9.19 | | 0.100 |
| SPA-6 | J1V4M0 | 2/26/15 | 1.2 | UR | 1.2 | 7.2 | | 1.7 | 1000 | U | 1000 | 680 | U | 680 | 2.4 | | 0.01 | 9.18 | | 0.100 |
| SPA-7 | J1V4M1 | 2/26/15 | 1.2 | UR | 1.2 | 20.3 | | 1.7 | 7400 | | 1000 | 4200 | | 690 | 3.0 | | 0.01 | 9.18 | | 0.100 |
| SPA-8 | J1V4M2 | 2/26/15 | 1.3 | UR | 1.3 | 12.9 | | 1.8 | 2600 | J | 1000 | 2300 | J | 680 | 6.3 | | 0.01 | 8.32 | | 0.100 |
| SPA-9 | J1V4M3 | 2/26/15 | 1.2 | UR | 1.2 | 7.9 | | 1.7 | 6000 | | 1000 | 4000 | | 680 | 3.9 | | 0.01 | 9.26 | | 0.100 |
| SPA-10 | J1V4M4 | 2/26/15 | 1.3 | UR | 1.3 | 8.7 | | 1.7 | 2700 | J | 960 | 2200 | J | 650 | 2.9 | | 0.01 | 9.17 | | 0.100 |
| SPA-11 | J1V4M5 | 4/2/15 | 1.2 | UR | 1.2 | 9.6 | | 1.7 | 1500 | J | 960 | 1800 | JB | 650 | 1.5 | | 0.01 | 8.92 | | 0.100 |
| SPA-12 | J1V4M6 | 4/2/15 | 1.4 | BJ | 1.3 | 181 | | 1.7 | 20000 | | 1100 | 8400 | B | 710 | 5.7 | | 0.01 | 8.60 | | 0.100 |
| SPA-13 | J1V4M7 | 2/26/15 | 3.1 | BJ | 1.3 | 8.1 | | 1.8 | 5300 | | 990 | 3300 | J | 670 | 7.0 | | 0.01 | 8.65 | | 0.100 |
| SPA-14 | J1V4M8 | 2/26/15 | 1.2 | UR | 1.2 | 7.2 | | 1.7 | 3500 | J | 1000 | 2500 | J | 700 | 3.2 | | 0.01 | 9.23 | | 0.100 |
| SPA-15 | J1V4M9 | 4/2/15 | 1.9 | BJ | 1.3 | 223 | | 1.7 | 38000 | | 1000 | 15000 | B | 690 | 4.0 | | 0.01 | 8.49 | | 0.100 |
| OVB-9[a] | J1V4N1 | 2/26/15 | 1.3 | UR | 1.3 | 9.8 | | 1.7 | 4000 | J | 1000 | 2400 | J | 700 | 4.4 | | 0.01 | 9.14 | | 0.100 |
| Duplicate of J1V4N1[a] | J1V4N3 | 2/26/15 | 1.2 | UR | 1.2 | 10 | | 1.7 | 4400 | | 970 | 2800 | J | 660 | 4.0 | | 0.01 | 9.14 | | 0.100 |
| OVB-1 | J1V255 | 12/10/14 | 2.2 | BJ | 1.3 | 13.5 | | 1.8 | 1500 | J | 1100 | 970 | J | 720 | 7.6 | | 0.01 | 8.90 | | 0.100 |
| OVB-2 | J1V256 | 12/10/14 | 1.3 | UR | 1.3 | 40.4 | | 1.8 | 5600 | | 1000 | 2500 | J | 700 | 8.2 | | 0.01 | 8.64 | | 0.100 |
| OVB-3 | J1V257 | 12/10/14 | 1.3 | UR | 1.3 | 25.8 | | 1.7 | 4200 | J | 1100 | 2100 | J | 720 | 7.5 | | 0.01 | 8.89 | | 0.100 |
| OVB-4 | J1V258 | 12/10/14 | 1.3 | UR | 1.3 | 9.8 | | 1.8 | 2300 | J | 990 | 970 | J | 670 | 5.6 | | 0.01 | 8.94 | | 0.100 |
| OVB-5 | J1V259 | 12/10/14 | 1.3 | UR | 1.3 | 8.1 | | 1.7 | 2800 | J | 1100 | 1600 | J | 710 | 7.3 | | 0.01 | 9.01 | | 0.100 |
| OVB-6 | J1V260 | 12/10/14 | 2.5 | BJ | 1.3 | 9.7 | | 1.8 | 2800 | J | 1000 | 1700 | J | 710 | 6.8 | | 0.01 | 9.05 | | 0.100 |
| OVB-7 | J1V261 | 12/10/14 | 2.0 | BJ | 1.2 | 8.1 | | 1.7 | 3100 | J | 1000 | 1800 | J | 700 | 5.7 | | 0.01 | 8.99 | | 0.100 |
| OVB-8 | J1V262 | 12/10/14 | 1.3 | UR | 1.3 | 15.8 | | 1.7 | 3000 | J | 1000 | 1400 | J | 690 | 5.1 | | 0.01 | 8.81 | | 0.100 |
| OVB-10 | J1V264 | 12/10/14 | 1.3 | UR | 1.3 | 8.3 | | 1.7 | 3200 | J | 1000 | 1300 | J | 680 | 6.4 | | 0.01 | 8.99 | | 0.100 |
| OVB-11 | J1V265 | 12/10/14 | 2.0 | BJ | 1.3 | 24.3 | | 1.7 | 2600 | J | 980 | 1400 | J | 670 | 5.7 | | 0.01 | 8.92 | | 0.100 |
| OVB-12[a] | J1V4N2 | 2/26/15 | 1.9 | BJ | 1.2 | 8.3 | | 1.7 | 7800 | | 1000 | 5600 | | 690 | 3.8 | | 0.01 | 9.12 | | 0.100 |
| OVB-9 | J1V263 | 12/10/14 | 1.3 | UR | 1.3 | 9.3 | | 1.8 | 3600 | J | 1000 | 1900 | J | 700 | 8.8 | | 0.01 | 8.94 | | 0.100 |
| Duplicate of J1V263 | J1V267 | 12/10/14 | 2.1 | BJ | 1.3 | 9.7 | N | 1.8 | 3200 | J | 1100 | 1700 | J | 730 | 9.7 | | 0.01 | 8.96 | | 0.100 |
| OVB-12 | J1V266 | 12/10/14 | 2.1 | BJ | 1.3 | 11.3 | | 1.7 | 39000 | N | 1000 | 33000 | N | 690 | 7.7 | | 0.01 | 8.88 | | 0.100 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 20 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

## Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (IC Anions).

| Sample Location | HEIS Number | Sample Date | Bromide | | | Chloride | | | Fluoride | | | Nitrogen in Nitrate | | | Nitrogen in Nitrite and Nitrate | | | Nitrogen in Nitrite | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL | mg/kg | Q | PQL |
| FS-1 | J1V281 | 12/15/14 | 0.42 | U | 0.42 | 2.1 | U | 2.1 | 1.9 | B | 0.88 | 1.3 | BJ | 0.34 | 0.61 | B | 0.39 | 0.36 | UJ | 0.36 |
| FS-2 | J1V282 | 12/15/14 | 0.40 | U | 0.40 | 2.0 | U | 2.0 | 0.84 | B | 0.83 | 0.32 | UJ | 0.32 | 0.36 | U | 0.36 | 0.34 | UJ | 0.34 |
| FS-3 | J1V283 | 12/15/14 | 0.43 | U | 0.43 | 2.2 | U | 2.2 | 1.2 | B | 0.90 | 3.9 | J | 0.34 | 4.6 | M | 0.40 | 0.37 | UJ | 0.37 |
| FS-4 | J1V284 | 12/15/14 | 0.40 | U | 0.40 | 2.0 | U | 2.0 | 1.0 | B | 0.83 | 1.5 | BJ | 0.32 | 1.0 | | 0.37 | 0.34 | UJ | 0.34 |
| RC-1 | J1TF83 | 2/26/14 | 0.38 | U | 0.38 | 7.0 | | 2.0 | 0.81 | U | 0.81 | 0.31 | UR | 0.31 | | | | 0.33 | UR | 0.33 |
| RC-2 | J1TF82 | 2/26/14 | 0.43 | U | 0.43 | 8.4 | | 2.2 | 1.2 | B | 0.90 | 2.7 | | 0.34 | | | | 0.37 | UR | 0.37 |
| RC-3 | J1T5W6 | 11/18/13 | 0.40 | U | 0.40 | 12.1 | | 2.0 | 0.84 | UN | 0.84 | 2.8 | | 0.32 | | | | 0.34 | U | 0.34 |

| Sample Location | HEIS Number | Sample Date | Phosphorous in phosphate | | | Sulfate | | | TPH-Diesel Ext. | | | TPH-Diesel | | | % moisture (wet sample) | | | pH Measurement | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | Q | PQL | mg/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | % | Q | PQL | pH | Q | PQL |
| FS-1 | J1V281 | 12/15/14 | 1.3 | UJ | 1.3 | 78.9 | | 1.8 | 8100 | J | 1000 | 3100 | J | 710 | 9.1 | | 0.10 | 8.72 | J | 0.100 |
| FS-2 | J1V282 | 12/15/14 | 1.3 | UJ | 1.3 | 7.4 | | 1.7 | 1800 | J | 960 | 1500 | J | 660 | 1.8 | | 0.10 | 9.09 | J | 0.100 |
| FS-3 | J1V283 | 12/15/14 | 2.3 | BJ | 1.4 | 89.6 | | 1.9 | 6300 | J | 1100 | 3100 | J | 720 | 9.6 | | 0.10 | 8.99 | J | 0.100 |
| FS-4 | J1V284 | 12/15/14 | 1.3 | UJ | 1.3 | 18.0 | | 1.7 | 3200 | J | 1000 | 1900 | J | 690 | 4.1 | | 0.10 | 9.09 | J | 0.100 |
| RC-1 | J1TF83 | 2/26/14 | 1.2 | UR | 1.2 | 11.7 | | 1.7 | 12000 | | 980 | 6300 | | 660 | 1.9 | | 0.10 | | | |
| RC-2 | J1TF82 | 2/26/14 | 1.4 | UR | 1.4 | 19.9 | | 1.9 | 18000 | | 1100 | 12000 | | 780 | 13.3 | | 0.10 | | | |
| RC-3 | J1T5W6 | 11/18/13 | 1.3 | UN | 1.3 | 13.4 | | 1.8 | 48000 | B | 1000 | 21000 | B | 680 | 4.5 | | 0.10 | | | |
| Equipment blank 2 | J1V4N4 | 2/26/15 | | | | | | | | | | | | | 0.10 | U | 0.10 | | | |
| Equipment blank 3 | J1V544 | 3/16/15 | | | | | | | | | | | | | 0.10 | U | 0.10 | | | |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 21 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Organics).**

| CONSTITUENT | CLASS | J1V272, EXC1-4 | | | J1V285, Duplicate of J1V272 | | | J1V543, EXC1-1[a] | | | J1V270, EXC1-2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/15/14 | | | 12/15/14 | | | 03/16/15 | | | 12/15/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Acenaphthene | PAH | 11 | U | 11 | 11 | U | 11 | 10 | U | 10 | 10 | U | 10 |
| Acenaphthylene | PAH | 9.5 | U | 9.5 | 9.5 | U | 9.5 | 9.3 | U | 9.3 | 9.4 | U | 9.4 |
| Anthracene | PAH | 3.2 | U | 3.2 | 3.2 | U | 3.2 | 3.1 | U | 3.1 | 3.2 | U | 3.2 |
| Benzo(a)anthracene | PAH | 3.4 | U | 3.4 | 3.4 | U | 3.4 | 3.3 | U | 3.3 | 15 | JX | 3.3 |
| Benzo(a)pyrene | PAH | 6.8 | U | 6.8 | 6.8 | U | 6.8 | 6.6 | U | 6.6 | 47 | X | 6.7 |
| Benzo(b)fluoranthene | PAH | 4.4 | U | 4.4 | 4.4 | U | 4.4 | 5.4 | J | 4.3 | 37 | X | 4.4 |
| Benzo(ghi)perylene | PAH | 7.6 | U | 7.6 | 7.6 | U | 7.6 | 7.4 | U | 7.4 | 43 | X | 7.6 |
| Benzo(k)fluoranthene | PAH | 4.2 | U | 4.2 | 4.2 | U | 4.2 | 4.1 | U | 4.1 | 11 | J | 4.1 |
| Chrysene | PAH | 5.1 | U | 5.1 | 5.1 | U | 5.1 | 7.5 | J | 5 | 29 | JX | 5.1 |
| Dibenz[a,h]anthracene | PAH | 12 | U | 12 | 12 | U | 12 | 11 | U | 11 | 12 | U | 12 |
| Fluoranthene | PAH | 14 | U | 14 | 14 | U | 14 | 13 | U | 13 | 63 | | 14 |
| Fluorene | PAH | 5.6 | U | 5.6 | 5.6 | U | 5.6 | 5.4 | U | 5.4 | 5.5 | U | 5.5 |
| Indeno(1,2,3-cd)pyrene | PAH | 13 | U | 13 | 13 | U | 13 | 12 | U | 12 | 13 | U | 13 |
| Naphthalene | PAH | 13 | U | 13 | 13 | U | 13 | 12 | U | 12 | 13 | U | 13 |
| Phenanthrene | PAH | 13 | U | 13 | 13 | U | 13 | 12 | U | 12 | 38 | J | 13 |
| Pyrene | PAH | 13 | U | 13 | 13 | U | 13 | 12 | U | 12 | 61 | | 13 |
| Aroclor-1016 | PCB | 2.8 | U | 2.8 | 2.8 | U | 2.8 | 2.8 | U | 2.8 | 2.9 | U | 2.9 |
| Aroclor-1221 | PCB | 8.0 | U | 8.0 | 8.0 | U | 8.0 | 8.0 | U | 8.0 | 8.4 | U | 8.4 |
| Aroclor-1232 | PCB | 2.0 | U | 2.0 | 2.0 | U | 2.0 | 2.0 | U | 2.0 | 2.1 | U | 2.1 |
| Aroclor-1242 | PCB | 4.7 | U | 4.7 | 4.7 | U | 4.7 | 4.6 | U | 4.6 | 4.9 | U | 4.9 |
| Aroclor-1248 | PCB | 4.7 | U | 4.7 | 4.7 | U | 4.7 | 4.6 | U | 4.6 | 4.9 | U | 4.9 |
| Aroclor-1254 | PCB | 15 | | 2.6 | 24 | | 2.6 | 2.6 | U | 2.6 | 2.7 | U | 2.7 |
| Aroclor-1260 | PCB | 2.6 | U | 2.6 | 2.6 | U | 2.6 | 2.6 | U | 2.6 | 15 | | 2.7 |
| Aldrin | PEST | 0.27 | U | 0.27 | 0.27 | U | 0.27 | 0.26 | U | 0.26 | 0.26 | U | 0.26 |
| Alpha-BHC | PEST | 0.23 | U | 0.23 | 0.23 | U | 0.23 | 0.22 | U | 0.22 | 0.22 | U | 0.22 |
| alpha-Chlordane | PEST | 0.35 | U | 0.35 | 0.35 | U | 0.35 | 0.33 | U | 0.33 | 0.34 | U | 0.34 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.71 | U | 0.71 | 0.72 | U | 0.72 | 0.68 | U | 0.68 | 0.69 | U | 0.69 |
| Delta-BHC | PEST | 0.43 | U | 0.43 | 0.43 | U | 0.43 | 0.41 | U | 0.41 | 0.42 | U | 0.42 |
| Dichlorodiphenyldichloroethane | PEST | 0.59 | U | 0.59 | 0.59 | U | 0.59 | 0.56 | U | 0.56 | 0.57 | U | 0.57 |
| Dichlorodiphenyldichloroethylene | PEST | 0.26 | U | 0.26 | 0.26 | U | 0.26 | 0.24 | U | 0.24 | 0.93 | JY | 0.25 |
| Dichlorodiphenyltrichloroethane | PEST | 0.74 | J | 0.63 | 1.1 | J | 0.64 | 0.60 | U | 0.60 | 2.9 | | 0.62 |
| Dieldrin | PEST | 0.23 | U | 0.23 | 0.23 | U | 0.23 | 0.21 | U | 0.21 | 0.22 | U | 0.22 |
| Endosulfan I | PEST | 0.19 | U | 0.19 | 0.19 | U | 0.19 | 0.18 | U | 0.18 | 0.18 | U | 0.18 |
| Endosulfan II | PEST | 0.31 | U | 0.31 | 0.31 | U | 0.31 | 0.29 | U | 0.29 | 0.30 | U | 0.30 |
| Endosulfan sulfate | PEST | 0.30 | U | 0.30 | 0.30 | U | 0.30 | 0.28 | U | 0.28 | 0.29 | U | 0.29 |
| Endrin | PEST | 0.33 | U | 0.33 | 0.33 | U | 0.33 | 0.31 | U | 0.31 | 0.32 | U | 0.32 |
| Endrin aldehyde | PEST | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.17 | U | 0.17 | 0.18 | U | 0.18 |
| Endrin ketone | PEST | 0.53 | U | 0.53 | 0.53 | U | 0.53 | 0.50 | U | 0.50 | 0.51 | U | 0.51 |
| Gamma-BHC (Lindane) | PEST | 0.50 | U | 0.50 | 0.50 | U | 0.50 | 0.47 | U | 0.47 | 0.49 | U | 0.49 |
| gamma-Chlordane | PEST | 0.29 | U | 0.29 | 0.29 | U | 0.29 | 0.27 | U | 0.27 | 0.28 | U | 0.28 |
| Heptachlor | PEST | 0.23 | U | 0.23 | 0.23 | U | 0.23 | 0.22 | U | 0.22 | 0.22 | U | 0.22 |
| Heptachlor epoxide | PEST | 0.46 | U | 0.46 | 0.46 | U | 0.46 | 0.43 | U | 0.43 | 0.45 | U | 0.45 |
| Methoxychlor | PEST | 0.48 | U | 0.48 | 0.49 | U | 0.49 | 0.46 | U | 0.46 | 0.47 | U | 0.47 |
| Toxaphene | PEST | 17 | UJ | 17 | 17 | UJ | 17 | 16 | U | 16 | 17 | UJ | 17 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 22 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Organics).**

| CONSTITUENT | CLASS | J1V271, EXC1-3 | | | J1V273, EXC1-5 | | | J1V274, EXC1-6 | | | J1V275, EXC1-7 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/15/14 | | | 12/15/14 | | | 12/15/14 | | | 12/15/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Acenaphthene | PAH | 10 | U | 10 | 9.9 | U | 9.9 | 9.5 | U | 9.5 | 16 | J | 9.9 |
| Acenaphthylene | PAH | 9.0 | U | 9.0 | 8.9 | U | 8.9 | 8.5 | U | 8.5 | 8.9 | U | 8.9 |
| Anthracene | PAH | 3.0 | U | 3.0 | 3.0 | U | 3.0 | 2.9 | U | 2.9 | 3.0 | U | 3.0 |
| Benzo(a)anthracene | PAH | 3.2 | U | 3.2 | 24 | | 3.2 | 3.0 | U | 3.0 | 32 | | 3.1 |
| Benzo(a)pyrene | PAH | 6.4 | U | 6.4 | 30 | | 6.3 | 6.1 | U | 6.1 | 28 | | 6.3 |
| Benzo(b)fluoranthene | PAH | 4.2 | U | 4.2 | 34 | X | 4.2 | 4.0 | U | 4.0 | 32 | | 4.1 |
| Benzo(ghi)perylene | PAH | 7.2 | U | 7.2 | 17 | JX | 7.1 | 6.8 | U | 6.8 | 29 | J | 7.1 |
| Benzo(k)fluoranthene | PAH | 3.9 | U | 3.9 | 13 | J | 3.9 | 3.7 | U | 3.7 | 9.6 | J | 3.9 |
| Chrysene | PAH | 4.8 | U | 4.8 | 18 | JX | 4.8 | 4.6 | U | 4.6 | 29 | JX | 4.8 |
| Dibenz[a,h]anthracene | PAH | 11 | U | 11 | 11 | U | 11 | 10 | U | 10 | 11 | U | 11 |
| Fluoranthene | PAH | 13 | U | 13 | 48 | | 13 | 12 | U | 12 | 78 | | 13 |
| Fluorene | PAH | 5.3 | U | 5.3 | 5.2 | U | 5.2 | 5.0 | U | 5.0 | 12 | J | 5.2 |
| Indeno(1,2,3-cd)pyrene | PAH | 12 | U | 12 | 25 | J | 12 | 11 | U | 11 | 21 | J | 12 |
| Naphthalene | PAH | 12 | U | 12 | 12 | U | 12 | 11 | U | 11 | 12 | U | 12 |
| Phenanthrene | PAH | 12 | U | 12 | 16 | J | 12 | 11 | U | 11 | 70 | | 12 |
| Pyrene | PAH | 12 | U | 12 | 49 | | 12 | 11 | U | 11 | 82 | | 12 |
| Aroclor-1016 | PCB | 2.8 | U | 2.8 | 2.8 | U | 2.8 | 2.8 | U | 2.8 | 2.8 | U | 2.8 |
| Aroclor-1221 | PCB | 8.1 | U | 8.1 | 8.2 | U | 8.2 | 8.2 | U | 8.2 | 8.1 | U | 8.1 |
| Aroclor-1232 | PCB | 2.0 | U | 2.0 | 2.0 | U | 2.0 | 2.0 | U | 2.0 | 2.0 | U | 2.0 |
| Aroclor-1242 | PCB | 4.7 | U | 4.7 | 4.8 | U | 4.8 | 4.7 | U | 4.7 | 4.7 | U | 4.7 |
| Aroclor-1248 | PCB | 4.7 | U | 4.7 | 4.8 | U | 4.8 | 4.7 | U | 4.7 | 4.7 | U | 4.7 |
| Aroclor-1254 | PCB | 2.6 | U | 2.6 | 2.7 | U | 2.7 | 2.6 | U | 2.6 | 2.6 | U | 2.6 |
| Aroclor-1260 | PCB | 2.6 | U | 2.6 | 2.7 | U | 2.7 | 2.6 | U | 2.6 | 2.6 | U | 2.6 |
| Aldrin | PEST | 0.25 | U | 0.25 | 0.26 | U | 0.26 | 0.25 | U | 0.25 | 0.26 | U | 0.26 |
| Alpha-BHC | PEST | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.22 | U | 0.22 |
| alpha-Chlordane | PEST | 0.32 | U | 0.32 | 0.33 | U | 0.33 | 0.33 | U | 0.33 | 0.33 | U | 0.33 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.66 | U | 0.66 | 0.68 | U | 0.68 | 0.67 | U | 0.67 | 0.67 | U | 0.67 |
| Delta-BHC | PEST | 0.40 | U | 0.40 | 0.41 | U | 0.41 | 0.40 | U | 0.40 | 0.41 | U | 0.41 |
| Dichlorodiphenyldichloroethane | PEST | 0.54 | U | 0.54 | 0.56 | U | 0.56 | 0.55 | U | 0.55 | 0.55 | U | 0.55 |
| Dichlorodiphenyldichloroethylene | PEST | 0.24 | U | 0.24 | 0.24 | U | 0.24 | 1.1 | J | 0.24 | 0.24 | U | 0.24 |
| Dichlorodiphenyltrichloroethane | PEST | 0.59 | U | 0.59 | 0.60 | U | 0.60 | 1.6 | J | 0.59 | 0.60 | U | 0.60 |
| Dieldrin | PEST | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.21 | U | 0.21 | 0.21 | U | 0.21 |
| Endosulfan I | PEST | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.18 | U | 0.18 |
| Endosulfan II | PEST | 0.29 | U | 0.29 | 0.29 | U | 0.29 | 0.29 | U | 0.29 | 0.29 | U | 0.29 |
| Endosulfan sulfate | PEST | 0.27 | U | 0.27 | 0.28 | U | 0.28 | 0.28 | U | 0.28 | 0.28 | U | 0.28 |
| Endrin | PEST | 0.30 | U | 0.30 | 0.31 | U | 0.31 | 0.31 | U | 0.31 | 0.31 | U | 0.31 |
| Endrin aldehyde | PEST | 0.17 | U | 0.17 | 0.18 | U | 0.18 | 0.17 | U | 0.17 | 0.17 | U | 0.17 |
| Endrin ketone | PEST | 0.49 | U | 0.49 | 0.50 | U | 0.50 | 0.49 | U | 0.49 | 0.50 | U | 0.50 |
| Gamma-BHC (Lindane) | PEST | 0.46 | U | 0.46 | 0.48 | U | 0.48 | 0.47 | U | 0.47 | 0.47 | U | 0.47 |
| gamma-Chlordane | PEST | 0.26 | U | 0.26 | 0.27 | U | 0.27 | 0.27 | U | 0.27 | 0.27 | U | 0.27 |
| Heptachlor | PEST | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.22 | U | 0.22 |
| Heptachlor epoxide | PEST | 0.42 | U | 0.42 | 0.44 | U | 0.44 | 0.43 | U | 0.43 | 0.43 | U | 0.43 |
| Methoxychlor | PEST | 0.45 | U | 0.45 | 0.46 | U | 0.46 | 0.45 | U | 0.45 | 0.46 | U | 0.46 |
| Toxaphene | PEST | 16 | UJ | 16 | 16 | UJ | 16 | 16 | UJ | 16 | 16 | UJ | 16 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 23 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Organics).**

| CONSTITUENT | CLASS | J1V276, EXC1-8 | | | J1V277, EXC1-9 | | | J1V278, EXC1-10 | | | J1V279, EXC1-11 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/15/14 | | | 12/15/14 | | | 12/15/14 | | | 12/15/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Acenaphthene | PAH | 11 | U | 11 | 10 | U | 10 | 11 | U | 11 | 9.8 | U | 9.8 |
| Acenaphthylene | PAH | 9.8 | U | 9.8 | 9.0 | U | 9.0 | 9.8 | U | 9.8 | 8.9 | U | 8.9 |
| Anthracene | PAH | 3.3 | U | 3.3 | 3.1 | U | 3.1 | 3.3 | U | 3.3 | 3.0 | U | 3.0 |
| Benzo(a)anthracene | PAH | 3.5 | U | 3.5 | 3.2 | U | 3.2 | 3.5 | U | 3.5 | 3.1 | U | 3.1 |
| Benzo(a)pyrene | PAH | 7.0 | U | 7.0 | 6.4 | U | 6.4 | 7.0 | U | 7.0 | 6.3 | U | 6.3 |
| Benzo(b)fluoranthene | PAH | 4.6 | U | 4.6 | 4.2 | U | 4.2 | 4.6 | U | 4.6 | 4.1 | U | 4.1 |
| Benzo(ghi)perylene | PAH | 7.8 | U | 7.8 | 7.2 | U | 7.2 | 7.9 | U | 7.9 | 7.1 | U | 7.1 |
| Benzo(k)fluoranthene | PAH | 4.3 | U | 4.3 | 3.9 | U | 3.9 | 4.3 | U | 4.3 | 3.9 | U | 3.9 |
| Chrysene | PAH | 5.3 | U | 5.3 | 4.8 | U | 4.8 | 5.3 | U | 5.3 | 4.8 | U | 4.8 |
| Dibenz[a,h]anthracene | PAH | 12 | U | 12 | 11 | U | 11 | 12 | U | 12 | 11 | U | 11 |
| Fluoranthene | PAH | 14 | U | 14 | 13 | U | 13 | 14 | U | 14 | 13 | U | 13 |
| Fluorene | PAH | 5.7 | U | 5.7 | 5.3 | U | 5.3 | 5.8 | U | 5.8 | 5.2 | U | 5.2 |
| Indeno(1,2,3-cd)pyrene | PAH | 13 | U | 13 | 12 | U | 12 | 13 | U | 13 | 12 | U | 12 |
| Naphthalene | PAH | 13 | U | 13 | 12 | U | 12 | 13 | U | 13 | 12 | U | 12 |
| Phenanthrene | PAH | 13 | U | 13 | 12 | U | 12 | 13 | U | 13 | 12 | U | 12 |
| Pyrene | PAH | 13 | U | 13 | 12 | U | 12 | 13 | U | 13 | 12 | U | 12 |
| Aroclor-1016 | PCB | 3.0 | U | 3.0 | 2.8 | U | 2.8 | 2.9 | U | 2.9 | 2.8 | U | 2.8 |
| Aroclor-1221 | PCB | 8.8 | U | 8.8 | 8.2 | U | 8.2 | 8.5 | U | 8.5 | 8.0 | U | 8.0 |
| Aroclor-1232 | PCB | 2.2 | U | 2.2 | 2.0 | U | 2.0 | 2.1 | U | 2.1 | 2.0 | U | 2.0 |
| Aroclor-1242 | PCB | 5.1 | U | 5.1 | 4.8 | U | 4.8 | 4.9 | U | 4.9 | 4.7 | U | 4.7 |
| Aroclor-1248 | PCB | 5.1 | U | 5.1 | 4.8 | U | 4.8 | 4.9 | U | 4.9 | 4.7 | U | 4.7 |
| Aroclor-1254 | PCB | 2.8 | U | 2.8 | 2.7 | U | 2.7 | 2.7 | U | 2.7 | 2.6 | U | 2.6 |
| Aroclor-1260 | PCB | 17 | | 2.8 | 2.7 | U | 2.7 | 2.7 | U | 2.7 | 14 | | 2.6 |
| Aldrin | PEST | 0.27 | U | 0.27 | 0.25 | U | 0.25 | 0.28 | U | 0.28 | 0.25 | U | 0.25 |
| Alpha-BHC | PEST | 0.23 | U | 0.23 | 0.22 | U | 0.22 | 0.23 | U | 0.23 | 0.21 | U | 0.21 |
| alpha-Chlordane | PEST | 0.35 | U | 0.35 | 0.33 | U | 0.33 | 0.35 | U | 0.35 | 0.32 | U | 0.32 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.72 | U | 0.72 | 0.67 | U | 0.67 | 0.73 | U | 0.73 | 0.66 | U | 0.66 |
| Delta-BHC | PEST | 0.44 | U | 0.44 | 0.41 | U | 0.41 | 0.44 | U | 0.44 | 0.40 | U | 0.40 |
| Dichlorodiphenyldichloroethane | PEST | 0.59 | U | 0.59 | 0.55 | U | 0.55 | 0.60 | U | 0.60 | 0.54 | U | 0.54 |
| Dichlorodiphenyldichloroethylene | PEST | 0.26 | U | 0.26 | 0.24 | U | 0.24 | 0.26 | U | 0.26 | 0.24 | U | 0.24 |
| Dichlorodiphenyltrichloroethane | PEST | 0.64 | U | 0.64 | 0.60 | U | 0.60 | 0.65 | U | 0.65 | 0.59 | U | 0.59 |
| Dieldrin | PEST | 0.23 | U | 0.23 | 0.21 | U | 0.21 | 0.23 | U | 0.23 | 0.21 | U | 0.21 |
| Endosulfan I | PEST | 0.19 | U | 0.19 | 0.18 | U | 0.18 | 0.19 | U | 0.19 | 0.17 | U | 0.17 |
| Endosulfan II | PEST | 0.31 | U | 0.31 | 0.29 | U | 0.29 | 0.31 | U | 0.31 | 0.29 | U | 0.29 |
| Endosulfan sulfate | PEST | 0.30 | U | 0.30 | 0.28 | U | 0.28 | 0.30 | U | 0.30 | 0.27 | U | 0.27 |
| Endrin | PEST | 0.33 | U | 0.33 | 0.31 | U | 0.31 | 0.34 | U | 0.34 | 0.30 | U | 0.30 |
| Endrin aldehyde | PEST | 0.19 | U | 0.19 | 0.17 | U | 0.17 | 0.19 | U | 0.19 | 0.17 | U | 0.17 |
| Endrin ketone | PEST | 0.53 | U | 0.53 | 0.5 | U | 0.5 | 0.54 | U | 0.54 | 0.49 | U | 0.49 |
| Gamma-BHC (Lindane) | PEST | 0.51 | U | 0.51 | 0.47 | U | 0.47 | 0.51 | U | 0.51 | 0.46 | U | 0.46 |
| gamma-Chlordane | PEST | 0.29 | U | 0.29 | 0.27 | U | 0.27 | 0.29 | U | 0.29 | 0.26 | U | 0.26 |
| Heptachlor | PEST | 0.23 | U | 0.23 | 0.22 | U | 0.22 | 0.23 | U | 0.23 | 0.21 | U | 0.21 |
| Heptachlor epoxide | PEST | 0.46 | U | 0.46 | 0.43 | U | 0.43 | 0.47 | U | 0.47 | 0.42 | U | 0.42 |
| Methoxychlor | PEST | 0.49 | U | 0.49 | 0.46 | U | 0.46 | 0.49 | U | 0.49 | 0.45 | U | 0.45 |
| Toxaphene | PEST | 17 | UJ | 17 | 16 | UJ | 16 | 17 | UJ | 17 | 16 | UJ | 16 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 24 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Organics).**

| CONSTITUENT | CLASS | J1V280, EXC1-12 | | | J1V292, EXC2-7 | | | J1V298, Duplicate of J1V292 | | | J1V286, EXC2-1 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/15/14 | | | 12/12/14 | | | 12/12/14 | | | 12/12/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Acenaphthene | PAH | 10 | U | 10 | 9.5 | U | 9.5 | 9.7 | U | 9.7 | 10 | U | 10 |
| Acenaphthylene | PAH | 9.3 | U | 9.3 | 8.5 | U | 8.5 | 8.8 | U | 8.8 | 9.2 | U | 9.2 |
| Anthracene | PAH | 3.2 | U | 3.2 | 2.9 | U | 2.9 | 3.0 | U | 3.0 | 3.1 | U | 3.1 |
| Benzo(a)anthracene | PAH | 3.3 | U | 3.3 | 16 | | 3.0 | 6.1 | J | 3.1 | 3.3 | U | 3.3 |
| Benzo(a)pyrene | PAH | 6.6 | U | 6.6 | 13 | J | 6.1 | 7.7 | J | 6.2 | 6.6 | U | 6.6 |
| Benzo(b)fluoranthene | PAH | 4.3 | U | 4.3 | 17 | | 4.0 | 6.2 | JX | 4.1 | 4.3 | U | 4.3 |
| Benzo(ghi)perylene | PAH | 7.4 | U | 7.4 | 6.8 | U | 6.8 | 7.0 | U | 7.0 | 7.4 | U | 7.4 |
| Benzo(k)fluoranthene | PAH | 4.1 | U | 4.1 | 5.3 | J | 3.7 | 3.8 | U | 3.8 | 4.0 | U | 4.0 |
| Chrysene | PAH | 5.0 | U | 5.0 | 12 | J | 4.6 | 4.7 | UX | 4.7 | 5.0 | U | 5.0 |
| Dibenz[a,h]anthracene | PAH | 11 | U | 11 | 10 | U | 10 | 11 | U | 11 | 11 | U | 11 |
| Fluoranthene | PAH | 13 | U | 13 | 33 | J | 12 | 13 | U | 13 | 13 | U | 13 |
| Fluorene | PAH | 5.5 | U | 5.5 | 5.0 | U | 5.0 | 5.1 | U | 5.1 | 5.4 | U | 5.4 |
| Indeno(1,2,3-cd)pyrene | PAH | 12 | U | 12 | 11 | U | 11 | 12 | U | 12 | 12 | U | 12 |
| Naphthalene | PAH | 12 | U | 12 | 11 | U | 11 | 12 | U | 12 | 12 | U | 12 |
| Phenanthrene | PAH | 12 | U | 12 | 16 | J | 11 | 12 | U | 12 | 12 | U | 12 |
| Pyrene | PAH | 12 | U | 12 | 30 | J | 11 | 12 | U | 12 | 12 | U | 12 |
| Aroclor-1016 | PCB | 2.9 | U | 2.9 | 2.9 | U | 2.9 | 2.7 | U | 2.7 | 2.8 | U | 2.8 |
| Aroclor-1221 | PCB | 8.3 | U | 8.3 | 8.3 | U | 8.3 | 7.9 | U | 7.9 | 8.0 | U | 8.0 |
| Aroclor-1232 | PCB | 2.1 | U | 2.1 | 2.1 | U | 2.1 | 2.0 | U | 2.0 | 2.0 | U | 2.0 |
| Aroclor-1242 | PCB | 4.8 | U | 4.8 | 4.8 | U | 4.8 | 4.6 | U | 4.6 | 4.6 | U | 4.6 |
| Aroclor-1248 | PCB | 4.8 | U | 4.8 | 4.8 | U | 4.8 | 4.6 | U | 4.6 | 4.6 | U | 4.6 |
| Aroclor-1254 | PCB | 2.7 | U | 2.7 | 2.7 | U | 2.7 | 2.6 | U | 2.6 | 2.6 | U | 2.6 |
| Aroclor-1260 | PCB | 2.7 | U | 2.7 | 2.7 | U | 2.7 | 2.6 | U | 2.6 | 2.6 | U | 2.6 |
| Aldrin | PEST | 0.25 | U | 0.25 | 0.26 | U | 0.26 | 0.26 | U | 0.26 | 0.25 | U | 0.25 |
| Alpha-BHC | PEST | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.21 | U | 0.21 |
| alpha-Chlordane | PEST | 0.32 | U | 0.32 | 0.33 | U | 0.33 | 0.34 | U | 0.34 | 0.32 | U | 0.32 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.67 | U | 0.67 | 0.68 | U | 0.68 | 0.69 | U | 0.69 | 0.66 | U | 0.66 |
| Delta-BHC | PEST | 0.40 | U | 0.40 | 0.41 | U | 0.41 | 0.42 | U | 0.42 | 0.40 | U | 0.40 |
| Dichlorodiphenyldichloroethane | PEST | 0.55 | U | 0.55 | 0.56 | U | 0.56 | 0.57 | U | 0.57 | 0.55 | U | 0.55 |
| Dichlorodiphenyldichloroethylene | PEST | 0.24 | U | 0.24 | 1.1 | J | 0.25 | 1.6 | J | 0.25 | 0.24 | U | 0.24 |
| Dichlorodiphenyltrichloroethane | PEST | 0.59 | U | 0.59 | 0.61 | U | 0.61 | 0.61 | U | 0.61 | 0.59 | U | 0.59 |
| Dieldrin | PEST | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.21 | U | 0.21 |
| Endosulfan I | PEST | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.18 | U | 0.18 |
| Endosulfan II | PEST | 0.29 | U | 0.29 | 0.30 | U | 0.30 | 0.30 | U | 0.30 | 0.29 | U | 0.29 |
| Endosulfan sulfate | PEST | 0.28 | U | 0.28 | 0.28 | U | 0.28 | 0.29 | U | 0.29 | 0.28 | U | 0.28 |
| Endrin | PEST | 0.31 | U | 0.31 | 0.32 | U | 0.32 | 0.32 | U | 0.32 | 0.31 | U | 0.31 |
| Endrin aldehyde | PEST | 0.17 | U | 0.17 | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.17 | U | 0.17 |
| Endrin ketone | PEST | 0.49 | U | 0.49 | 0.50 | U | 0.50 | 0.51 | U | 0.51 | 0.49 | U | 0.49 |
| Gamma-BHC (Lindane) | PEST | 0.47 | U | 0.47 | 0.48 | U | 0.48 | 0.48 | U | 0.48 | 0.46 | U | 0.46 |
| gamma-Chlordane | PEST | 0.27 | U | 0.27 | 0.27 | U | 0.27 | 0.28 | U | 0.28 | 0.27 | U | 0.27 |
| Heptachlor | PEST | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.21 | U | 0.21 |
| Heptachlor epoxide | PEST | 0.43 | U | 0.43 | 0.44 | U | 0.44 | 0.44 | U | 0.44 | 0.43 | U | 0.43 |
| Methoxychlor | PEST | 0.45 | U | 0.45 | 0.46 | U | 0.46 | 0.47 | U | 0.47 | 0.45 | U | 0.45 |
| Toxaphene | PEST | 16 | UJ | 16 | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 25 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Organics).**

| CONSTITUENT | CLASS | J1V287, EXC2-2 | | | J1V288, EXC2-3 | | | J1V289, EXC2-4 | | | J1V290, EXC2-5 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/12/14 | | | 12/12/14 | | | 12/12/14 | | | 12/12/14 | | |
| | | 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 | 9.4 | U | 9.4 |
| Acenaphthylene | PAH | 8.8 | U | 8.8 | 8.7 | U | 8.7 | 9.0 | U | 9.0 | 8.5 | U | 8.5 |
| Anthracene | PAH | 3.0 | U | 3.0 | 3.0 | U | 3.0 | 3.1 | U | 3.1 | 2.9 | U | 2.9 |
| Benzo(a)anthracene | PAH | 3.1 | U | 3.1 | 12 | JX | 3.1 | 3.2 | U | 3.2 | 3.0 | U | 3.0 |
| Benzo(a)pyrene | PAH | 6.3 | U | 6.3 | 26 | | 6.2 | 6.4 | U | 6.4 | 6.0 | U | 6.0 |
| Benzo(b)fluoranthene | PAH | 4.1 | U | 4.1 | 28 | X | 4.1 | 4.2 | U | 4.2 | 3.9 | U | 3.9 |
| Benzo(ghi)perylene | PAH | 7.1 | U | 7.1 | 25 | J | 7.0 | 7.2 | U | 7.2 | 6.8 | U | 6.8 |
| Benzo(k)fluoranthene | PAH | 3.9 | U | 3.9 | 11 | J | 3.8 | 4.0 | U | 4.0 | 3.7 | U | 3.7 |
| Chrysene | PAH | 4.8 | U | 4.8 | 23 | J | 4.7 | 4.9 | U | 4.9 | 4.5 | U | 4.5 |
| Dibenz[a,h]anthracene | PAH | 11 | U | 11 | 11 | U | 11 | 11 | U | 11 | 10 | U | 10 |
| Fluoranthene | PAH | 13 | U | 13 | 31 | J | 13 | 13 | U | 13 | 12 | U | 12 |
| Fluorene | PAH | 5.2 | U | 5.2 | 5.1 | U | 5.1 | 5.3 | U | 5.3 | 5.0 | U | 5.0 |
| Indeno(1,2,3-cd)pyrene | PAH | 12 | U | 12 | 21 | J | 12 | 12 | U | 12 | 11 | U | 11 |
| Naphthalene | PAH | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 | 11 | U | 11 |
| Phenanthrene | PAH | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 | 11 | U | 11 |
| Pyrene | PAH | 12 | U | 12 | 34 | J | 12 | 12 | U | 12 | 11 | U | 11 |
| Aroclor-1016 | PCB | 2.8 | U | 2.8 | 2.9 | U | 2.9 | 2.8 | U | 2.8 | 2.8 | U | 2.8 |
| Aroclor-1221 | PCB | 8.1 | U | 8.1 | 8.4 | U | 8.4 | 8.2 | U | 8.2 | 8.0 | U | 8.0 |
| Aroclor-1232 | PCB | 2.0 | U | 2.0 | 2.1 | U | 2.1 | 2.0 | U | 2.0 | 2.0 | U | 2.0 |
| Aroclor-1242 | PCB | 4.7 | U | 4.7 | 4.9 | U | 4.9 | 4.7 | U | 4.7 | 4.6 | U | 4.6 |
| Aroclor-1248 | PCB | 4.7 | U | 4.7 | 4.9 | U | 4.9 | 4.7 | U | 4.7 | 4.6 | U | 4.6 |
| Aroclor-1254 | PCB | 2.6 | U | 2.6 | 2.7 | U | 2.7 | 2.6 | U | 2.6 | 2.6 | U | 2.6 |
| Aroclor-1260 | PCB | 2.6 | U | 2.6 | 2.7 | U | 2.7 | 2.6 | U | 2.6 | 2.6 | U | 2.6 |
| Aldrin | PEST | 0.26 | U | 0.26 | 0.25 | U | 0.25 | 0.25 | U | 0.25 | 0.26 | U | 0.26 |
| Alpha-BHC | PEST | 0.22 | U | 0.22 | 0.21 | U | 0.21 | 0.21 | U | 0.21 | 0.22 | U | 0.22 |
| alpha-Chlordane | PEST | 0.34 | U | 0.34 | 0.32 | U | 0.32 | 0.32 | U | 0.32 | 0.33 | U | 0.33 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.69 | U | 0.69 | 0.66 | U | 0.66 | 0.66 | U | 0.66 | 0.68 | U | 0.68 |
| Delta-BHC | PEST | 0.42 | U | 0.42 | 0.40 | U | 0.40 | 0.40 | U | 0.40 | 0.41 | U | 0.41 |
| Dichlorodiphenyldichloroethane | PEST | 0.57 | U | 0.57 | 0.55 | U | 0.55 | 0.54 | U | 0.54 | 0.56 | U | 0.56 |
| Dichlorodiphenyldichloroethylene | PEST | 0.25 | U | 0.25 | 0.24 | U | 0.24 | 0.24 | U | 0.24 | 0.24 | U | 0.24 |
| Dichlorodiphenyltrichloroethane | PEST | 0.61 | U | 0.61 | 0.59 | U | 0.59 | 0.59 | U | 0.59 | 0.60 | U | 0.60 |
| Dieldrin | PEST | 0.22 | U | 0.22 | 0.21 | U | 0.21 | 0.21 | U | 0.21 | 0.21 | U | 0.21 |
| Endosulfan I | PEST | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.18 | U | 0.18 |
| Endosulfan II | PEST | 0.30 | U | 0.30 | 0.29 | U | 0.29 | 0.29 | U | 0.29 | 0.29 | U | 0.29 |
| Endosulfan sulfate | PEST | 0.29 | U | 0.29 | 0.28 | U | 0.28 | 0.28 | U | 0.28 | 0.28 | U | 0.28 |
| Endrin | PEST | 0.32 | U | 0.32 | 0.31 | U | 0.31 | 0.31 | U | 0.31 | 0.31 | U | 0.31 |
| Endrin aldehyde | PEST | 0.18 | U | 0.18 | 0.17 | U | 0.17 | 0.17 | U | 0.17 | 0.18 | U | 0.18 |
| Endrin ketone | PEST | 0.51 | U | 0.51 | 0.49 | U | 0.49 | 0.49 | U | 0.49 | 0.50 | U | 0.50 |
| Gamma-BHC (Lindane) | PEST | 0.48 | U | 0.48 | 0.46 | U | 0.46 | 0.46 | U | 0.46 | 0.48 | U | 0.48 |
| gamma-Chlordane | PEST | 0.28 | U | 0.28 | 0.27 | U | 0.27 | 0.27 | U | 0.27 | 0.27 | U | 0.27 |
| Heptachlor | PEST | 0.22 | U | 0.22 | 0.21 | U | 0.21 | 0.21 | U | 0.21 | 0.22 | U | 0.22 |
| Heptachlor epoxide | PEST | 0.44 | U | 0.44 | 0.43 | U | 0.43 | 0.42 | U | 0.42 | 0.44 | U | 0.44 |
| Methoxychlor | PEST | 0.47 | U | 0.47 | 0.45 | U | 0.45 | 0.45 | U | 0.45 | 0.46 | U | 0.46 |
| Toxaphene | PEST | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 26 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Organics).**

| CONSTITUENT | CLASS | J1V291, EXC2-6 | | | J1V293, EXC2-8 | | | J1V294, EXC2-9 | | | J1V295, EXC2-10 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/12/14 | | | 12/12/14 | | | 12/12/14 | | | 12/12/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Acenaphthene | PAH | 9.9 | U | 9.9 | 10 | U | 10 | 10 | UN | 10 | 9.5 | U | 9.5 |
| Acenaphthylene | PAH | 8.9 | U | 8.9 | 9.0 | U | 9.0 | 9.0 | U | 9.0 | 8.5 | U | 8.5 |
| Anthracene | PAH | 3.0 | U | 3.0 | 3.1 | U | 3.1 | 3.1 | U | 3.1 | 2.9 | U | 2.9 |
| Benzo(a)anthracene | PAH | 3.2 | U | 3.2 | 3.2 | U | 3.2 | 3.2 | UN | 3.2 | 3.0 | U | 3.0 |
| Benzo(a)pyrene | PAH | 6.3 | U | 6.3 | 6.4 | U | 6.4 | 6.4 | U | 6.4 | 6.1 | U | 6.1 |
| Benzo(b)fluoranthene | PAH | 4.1 | U | 4.1 | 4.2 | U | 4.2 | 4.2 | UN | 4.2 | 4.0 | U | 4.0 |
| Benzo(ghi)perylene | PAH | 7.1 | U | 7.1 | 7.2 | U | 7.2 | 7.2 | U | 7.2 | 6.8 | U | 6.8 |
| Benzo(k)fluoranthene | PAH | 3.9 | U | 3.9 | 3.9 | U | 3.9 | 4.0 | UN | 4.0 | 3.7 | U | 3.7 |
| Chrysene | PAH | 4.8 | U | 4.8 | 4.8 | U | 4.8 | 4.9 | U | 4.9 | 4.6 | U | 4.6 |
| Dibenz[a,h]anthracene | PAH | 11 | U | 11 | 11 | U | 11 | 11 | UN | 11 | 10 | U | 10 |
| Fluoranthene | PAH | 13 | U | 13 | 13 | U | 13 | 13 | UN | 13 | 12 | U | 12 |
| Fluorene | PAH | 5.2 | U | 5.2 | 5.3 | U | 5.3 | 5.3 | U | 5.3 | 5.0 | U | 5.0 |
| Indeno(1,2,3-cd)pyrene | PAH | 12 | U | 12 | 12 | U | 12 | 12 | UN | 12 | 11 | U | 11 |
| Naphthalene | PAH | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 | 11 | U | 11 |
| Phenanthrene | PAH | 12 | U | 12 | 12 | U | 12 | 12 | UN | 12 | 11 | U | 11 |
| Pyrene | PAH | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 | 11 | U | 11 |
| Aroclor-1016 | PCB | 3.0 | U | 3.0 | 2.7 | U | 2.7 | 2.9 | U | 2.9 | 2.7 | U | 2.7 |
| Aroclor-1221 | PCB | 8.5 | U | 8.5 | 7.8 | U | 7.8 | 8.3 | U | 8.3 | 7.7 | U | 7.7 |
| Aroclor-1232 | PCB | 2.1 | U | 2.1 | 1.9 | U | 1.9 | 2.1 | U | 2.1 | 1.9 | U | 1.9 |
| Aroclor-1242 | PCB | 5.0 | U | 5.0 | 4.5 | U | 4.5 | 4.8 | U | 4.8 | 4.5 | U | 4.5 |
| Aroclor-1248 | PCB | 5.0 | U | 5.0 | 4.5 | U | 4.5 | 4.8 | U | 4.8 | 4.5 | U | 4.5 |
| Aroclor-1254 | PCB | 2.8 | U | 2.8 | 2.5 | U | 2.5 | 2.7 | U | 2.7 | 2.5 | U | 2.5 |
| Aroclor-1260 | PCB | 2.8 | U | 2.8 | 2.5 | U | 2.5 | 2.7 | U | 2.7 | 2.5 | U | 2.5 |
| Aldrin | PEST | 0.26 | U | 0.26 | 0.26 | U | 0.26 | 0.26 | U | 0.26 | 0.26 | U | 0.26 |
| Alpha-BHC | PEST | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.22 | U | 0.22 |
| alpha-Chlordane | PEST | 0.34 | U | 0.34 | 0.33 | U | 0.33 | 0.33 | U | 0.33 | 0.33 | U | 0.33 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.69 | U | 0.69 | 0.68 | U | 0.68 | 0.68 | U | 0.68 | 0.68 | U | 0.68 |
| Delta-BHC | PEST | 0.42 | U | 0.42 | 0.41 | U | 0.41 | 0.41 | U | 0.41 | 0.41 | U | 0.41 |
| Dichlorodiphenyldichloroethane | PEST | 0.57 | U | 0.57 | 0.56 | U | 0.56 | 0.56 | U | 0.56 | 0.56 | U | 0.56 |
| Dichlorodiphenyldichloroethylene | PEST | 0.25 | U | 0.25 | 0.24 | U | 0.24 | 0.24 | U | 0.24 | 0.24 | U | 0.24 |
| Dichlorodiphenyltrichloroethane | PEST | 0.62 | U | 0.62 | 0.61 | U | 0.61 | 0.61 | U | 0.61 | 0.60 | U | 0.60 |
| Dieldrin | PEST | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.21 | U | 0.21 |
| Endosulfan I | PEST | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.18 | U | 0.18 |
| Endosulfan II | PEST | 0.30 | U | 0.30 | 0.29 | U | 0.29 | 0.29 | U | 0.29 | 0.29 | U | 0.29 |
| Endosulfan sulfate | PEST | 0.29 | U | 0.29 | 0.28 | U | 0.28 | 0.28 | U | 0.28 | 0.28 | U | 0.28 |
| Endrin | PEST | 0.32 | U | 0.32 | 0.31 | U | 0.31 | 0.31 | U | 0.31 | 0.31 | U | 0.31 |
| Endrin aldehyde | PEST | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.17 | U | 0.17 |
| Endrin ketone | PEST | 0.51 | U | 0.51 | 0.50 | U | 0.50 | 0.50 | U | 0.50 | 0.50 | U | 0.50 |
| Gamma-BHC (Lindane) | PEST | 0.48 | U | 0.48 | 0.48 | U | 0.48 | 0.48 | U | 0.48 | 0.47 | U | 0.47 |
| gamma-Chlordane | PEST | 0.28 | U | 0.28 | 0.27 | U | 0.27 | 0.27 | U | 0.27 | 0.27 | U | 0.27 |
| Heptachlor | PEST | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.22 | U | 0.22 |
| Heptachlor epoxide | PEST | 0.45 | U | 0.45 | 0.44 | U | 0.44 | 0.44 | U | 0.44 | 0.44 | U | 0.44 |
| Methoxychlor | PEST | 0.47 | U | 0.47 | 0.46 | U | 0.46 | 0.46 | U | 0.46 | 0.46 | U | 0.46 |
| Toxaphene | PEST | 17 | U | 17 | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 27 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Organics).**

| CONSTITUENT | CLASS | J1V296, EXC2-11 | | | J1V297, EXC2-12 | | | J1V269, EXC1-1 | | | J1V4L5, SPA-1 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/12/14 | | | 12/12/14 | | | 12/15/14 | | | 02/26/15 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Acenaphthene | PAH | 9.4 | U | 9.4 | 10 | U | 10 | 20 | J | 11 | 10 | UN | 10 |
| Acenaphthylene | PAH | 8.5 | U | 8.5 | 9.1 | U | 9.1 | 9.8 | U | 9.8 | 9.2 | U | 9.2 |
| Anthracene | PAH | 2.9 | U | 2.9 | 3.1 | U | 3.1 | 60 | X | 3.3 | 3.1 | U | 3.1 |
| Benzo(a)anthracene | PAH | 3.0 | U | 3.0 | 6.2 | JX | 3.2 | 180 | | 3.5 | 3.3 | UN | 3.3 |
| Benzo(a)pyrene | PAH | 6.0 | U | 6.0 | 14 | J | 6.5 | 200 | | 7.0 | 6.5 | U | 6.5 |
| Benzo(b)fluoranthene | PAH | 4.0 | U | 4.0 | 16 | | 4.3 | 110 | | 4.6 | 4.3 | U | 4.3 |
| Benzo(ghi)perylene | PAH | 6.8 | U | 6.8 | 7.3 | U | 7.3 | 150 | | 7.8 | 7.3 | U | 7.3 |
| Benzo(k)fluoranthene | PAH | 3.7 | U | 3.7 | 4.1 | J | 4.0 | 78 | | 4.3 | 4.0 | UN | 4.0 |
| Chrysene | PAH | 4.6 | U | 4.6 | 10 | J | 4.9 | 180 | | 5.3 | 4.9 | UN | 4.9 |
| Dibenz[a,h]anthracene | PAH | 10 | U | 10 | 11 | U | 11 | 18 | JX | 12 | 11 | UN | 11 |
| Fluoranthene | PAH | 12 | U | 12 | 24 | J | 13 | 410 | N | 14 | 13 | UN | 13 |
| Fluorene | PAH | 5.0 | U | 5.0 | 5.3 | U | 5.3 | 17 | J | 5.7 | 5.4 | UN | 5.4 |
| Indeno(1,2,3-cd)pyrene | PAH | 11 | U | 11 | 12 | U | 12 | 110 | | 13 | 12 | U | 12 |
| Naphthalene | PAH | 11 | U | 11 | 12 | U | 12 | 13 | U | 13 | 12 | UN | 12 |
| Phenanthrene | PAH | 11 | U | 11 | 12 | U | 12 | 360 | N | 13 | 12 | UN | 12 |
| Pyrene | PAH | 11 | U | 11 | 24 | J | 12 | 610 | N | 13 | 12 | U | 12 |
| Aroclor-1016 | PCB | 2.8 | U | 2.8 | 2.8 | U | 2.8 | 2.9 | U | 2.9 | 2.8 | U | 2.8 |
| Aroclor-1221 | PCB | 8.1 | U | 8.1 | 8.2 | U | 8.2 | 8.4 | U | 8.4 | 8.1 | U | 8.1 |
| Aroclor-1232 | PCB | 2.0 | U | 2.0 | 2.0 | U | 2.0 | 2.1 | U | 2.1 | 2.0 | U | 2.0 |
| Aroclor-1242 | PCB | 4.7 | U | 4.7 | 4.8 | U | 4.8 | 4.9 | U | 4.9 | 4.7 | U | 4.7 |
| Aroclor-1248 | PCB | 4.7 | U | 4.7 | 4.8 | U | 4.8 | 4.9 | U | 4.9 | 4.7 | U | 4.7 |
| Aroclor-1254 | PCB | 2.6 | U | 2.6 | 2.7 | U | 2.7 | 2.7 | U | 2.7 | 2.6 | U | 2.6 |
| Aroclor-1260 | PCB | 2.6 | U | 2.6 | 2.7 | U | 2.7 | 2.7 | U | 2.7 | 2.6 | U | 2.6 |
| Aldrin | PEST | 0.25 | U | 0.25 | 0.26 | U | 0.26 | 0.27 | U | 0.27 | 0.24 | U | 0.24 |
| Alpha-BHC | PEST | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.23 | U | 0.23 | 0.21 | U | 0.21 |
| alpha-Chlordane | PEST | 0.32 | U | 0.32 | 0.33 | U | 0.33 | 0.34 | U | 0.34 | 0.31 | U | 0.31 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.67 | U | 0.67 | 0.68 | U | 0.68 | 0.70 | U | 0.70 | 0.64 | U | 0.64 |
| Delta-BHC | PEST | 0.40 | U | 0.40 | 0.41 | U | 0.41 | 0.43 | U | 0.43 | 0.38 | U | 0.38 |
| Dichlorodiphenyldichloroethane | PEST | 0.55 | U | 0.55 | 0.56 | U | 0.56 | 0.58 | U | 0.58 | 0.52 | U | 0.52 |
| Dichlorodiphenyldichloroethylene | PEST | 0.24 | U | 0.24 | 5.0 | | 0.24 | 0.25 | U | 0.25 | 0.23 | U | 0.23 |
| Dichlorodiphenyltrichloroethane | PEST | 0.59 | U | 0.59 | 0.68 | JX | 0.60 | 0.63 | U | 0.63 | 0.57 | U | 0.57 |
| Dieldrin | PEST | 0.21 | U | 0.21 | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.20 | U | 0.20 |
| Endosulfan I | PEST | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.19 | U | 0.19 | 0.17 | U | 0.17 |
| Endosulfan II | PEST | 0.29 | U | 0.29 | 0.29 | U | 0.29 | 0.30 | U | 0.30 | 0.27 | U | 0.27 |
| Endosulfan sulfate | PEST | 0.28 | U | 0.28 | 0.28 | U | 0.28 | 0.29 | U | 0.29 | 0.26 | U | 0.26 |
| Endrin | PEST | 0.31 | U | 0.31 | 0.31 | U | 0.31 | 0.32 | U | 0.32 | 0.29 | U | 0.29 |
| Endrin aldehyde | PEST | 0.17 | U | 0.17 | 0.17 | U | 0.17 | 0.18 | U | 0.18 | 0.16 | U | 0.16 |
| Endrin ketone | PEST | 0.49 | U | 0.49 | 0.50 | U | 0.50 | 0.52 | U | 0.52 | 0.47 | U | 0.47 |
| Gamma-BHC (Lindane) | PEST | 0.47 | U | 0.47 | 0.47 | U | 0.47 | 0.49 | U | 0.49 | 0.44 | U | 0.44 |
| gamma-Chlordane | PEST | 0.27 | U | 0.27 | 0.27 | U | 0.27 | 0.28 | U | 0.28 | 0.25 | U | 0.25 |
| Heptachlor | PEST | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.23 | U | 0.23 | 0.21 | U | 0.21 |
| Heptachlor epoxide | PEST | 0.43 | U | 0.43 | 0.43 | U | 0.43 | 0.45 | U | 0.45 | 0.41 | U | 0.41 |
| Methoxychlor | PEST | 0.45 | U | 0.45 | 0.46 | U | 0.46 | 0.48 | U | 0.48 | 0.43 | U | 0.43 |
| Toxaphene | PEST | 16 | U | 16 | 16 | U | 16 | 17 | U | 17 | 15 | U | 15 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 28 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Organics).**

| CONSTITUENT | CLASS | J1V4N0, 02/26/15 | | | J1V4L6, SPA-2 02/26/15 | | | J1V4L7, SPA-3 02/26/15 | | | J1V4L8, SPA-4 02/26/15 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Acenaphthene | PAH | 9.9 | U | 9.9 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| Acenaphthylene | PAH | 9.0 | U | 9.0 | 9.1 | U | 9.1 | 9.0 | U | 9.0 | 9.1 | U | 9.1 |
| Anthracene | PAH | 3.0 | U | 3.0 | 3.1 | U | 3.1 | 3.0 | U | 3.0 | 3.1 | U | 3.1 |
| Benzo(a)anthracene | PAH | 3.2 | U | 3.2 | 3.8 | JX | 3.2 | 3.2 | U | 3.2 | 5.1 | JX | 3.2 |
| Benzo(a)pyrene | PAH | 6.4 | U | 6.4 | 6.5 | U | 6.5 | 6.4 | U | 6.4 | 16 | | 6.5 |
| Benzo(b)fluoranthene | PAH | 4.2 | U | 4.2 | 4.2 | U | 4.2 | 4.2 | U | 4.2 | 16 | | 4.2 |
| Benzo(ghi)perylene | PAH | 7.2 | U | 7.2 | 7.2 | U | 7.2 | 7.2 | U | 7.2 | 7.3 | U | 7.3 |
| Benzo(k)fluoranthene | PAH | 3.9 | U | 3.9 | 4.0 | U | 4.0 | 3.9 | U | 3.9 | 4.6 | J | 4.0 |
| Chrysene | PAH | 4.8 | U | 4.8 | 4.9 | U | 4.9 | 4.8 | U | 4.8 | 14 | J | 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 | 27 | J | 13 |
| Fluorene | PAH | 5.3 | U | 5.3 | 5.3 | U | 5.3 | 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 | 16 | J | 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 | 16 | J | 12 |
| Pyrene | PAH | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 | 33 | J | 12 |
| Aroclor-1016 | PCB | 2.8 | U | 2.8 | 2.8 | U | 2.8 | 2.7 | U | 2.7 | 2.7 | U | 2.7 |
| Aroclor-1221 | PCB | 8.1 | U | 8.1 | 8.0 | U | 8.0 | 7.7 | U | 7.7 | 7.9 | U | 7.9 |
| Aroclor-1232 | PCB | 2.0 | U | 2.0 | 2.0 | U | 2.0 | 1.9 | U | 1.9 | 2.0 | U | 2.0 |
| Aroclor-1242 | PCB | 4.7 | U | 4.7 | 4.7 | U | 4.7 | 4.5 | U | 4.5 | 4.6 | U | 4.6 |
| Aroclor-1248 | PCB | 4.7 | U | 4.7 | 4.7 | U | 4.7 | 4.5 | U | 4.5 | 4.6 | U | 4.6 |
| Aroclor-1254 | PCB | 2.6 | U | 2.6 | 2.6 | U | 2.6 | 2.5 | U | 2.5 | 2.5 | U | 2.5 |
| Aroclor-1260 | PCB | 2.6 | U | 2.6 | 2.6 | U | 2.6 | 2.5 | U | 2.5 | 2.5 | U | 2.5 |
| Aldrin | PEST | 0.25 | U | 0.25 | 0.25 | U | 0.25 | 0.24 | U | 0.24 | 0.25 | U | 0.25 |
| Alpha-BHC | PEST | 0.21 | U | 0.21 | 0.21 | U | 0.21 | 0.21 | U | 0.21 | 0.21 | U | 0.21 |
| alpha-Chlordane | PEST | 0.32 | U | 0.32 | 0.32 | U | 0.32 | 0.31 | U | 0.31 | 0.32 | U | 0.32 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.66 | U | 0.66 | 0.66 | U | 0.66 | 0.64 | U | 0.64 | 0.67 | U | 0.67 |
| Delta-BHC | PEST | 0.40 | U | 0.40 | 0.40 | U | 0.40 | 0.39 | U | 0.39 | 0.40 | U | 0.40 |
| Dichlorodiphenyldichloroethane | PEST | 0.54 | U | 0.54 | 0.54 | U | 0.54 | 0.53 | U | 0.53 | 0.55 | U | 0.55 |
| Dichlorodiphenyldichloroethylene | PEST | 0.24 | U | 0.24 | 0.24 | U | 0.24 | 0.23 | U | 0.23 | 0.24 | U | 0.24 |
| Dichlorodiphenyltrichloroethane | PEST | 0.58 | U | 0.58 | 0.59 | U | 0.59 | 0.57 | U | 0.57 | 0.59 | U | 0.59 |
| Dieldrin | PEST | 0.21 | U | 0.21 | 0.21 | U | 0.21 | 0.20 | U | 0.20 | 0.21 | U | 0.21 |
| Endosulfan I | PEST | 0.17 | U | 0.17 | 0.17 | U | 0.17 | 0.17 | U | 0.17 | 0.18 | U | 0.18 |
| Endosulfan II | PEST | 0.28 | U | 0.28 | 0.29 | U | 0.29 | 0.28 | U | 0.28 | 0.29 | U | 0.29 |
| Endosulfan sulfate | PEST | 0.27 | U | 0.27 | 0.27 | U | 0.27 | 0.27 | U | 0.27 | 0.28 | U | 0.28 |
| Endrin | PEST | 0.30 | U | 0.30 | 0.30 | U | 0.30 | 0.30 | U | 0.30 | 0.31 | U | 0.31 |
| Endrin aldehyde | PEST | 0.17 | U | 0.17 | 0.17 | U | 0.17 | 0.17 | U | 0.17 | 0.17 | U | 0.17 |
| Endrin ketone | PEST | 0.48 | U | 0.48 | 0.49 | U | 0.49 | 0.47 | U | 0.47 | 0.49 | U | 0.49 |
| Gamma-BHC (Lindane) | PEST | 0.46 | U | 0.46 | 0.46 | U | 0.46 | 0.45 | U | 0.45 | 0.47 | U | 0.47 |
| gamma-Chlordane | PEST | 0.26 | U | 0.26 | 0.26 | U | 0.26 | 0.26 | U | 0.26 | 0.27 | U | 0.27 |
| Heptachlor | PEST | 0.21 | U | 0.21 | 0.21 | U | 0.21 | 0.21 | U | 0.21 | 0.21 | U | 0.21 |
| Heptachlor epoxide | PEST | 0.42 | U | 0.42 | 0.42 | U | 0.42 | 0.41 | U | 0.41 | 0.43 | U | 0.43 |
| Methoxychlor | PEST | 0.45 | U | 0.45 | 0.45 | U | 0.45 | 0.44 | U | 0.44 | 0.45 | U | 0.45 |
| Toxaphene | PEST | 16 | U | 16 | 16 | U | 16 | 15 | U | 15 | 16 | U | 16 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 29 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Organics).**

| CONSTITUENT | CLASS | J1V4L9, SPA-5 | | | J1V4M0, SPA-6 | | | J1V4M1, SPA-7 | | | J1V4M2, SPA-8 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 02/26/15 | | | 02/26/15 | | | 02/26/15 | | | 02/26/15 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Acenaphthene | PAH | 9.8 | U | 9.8 | 9.5 | U | 9.5 | 15 | JX | 10 | 10 | U | 10 |
| Acenaphthylene | PAH | 8.8 | U | 8.8 | 8.6 | U | 8.6 | 9.3 | U | 9.3 | 9.2 | U | 9.2 |
| Anthracene | PAH | 3.0 | U | 3.0 | 2.9 | U | 2.9 | 3.1 | U | 3.1 | 3.1 | U | 3.1 |
| Benzo(a)anthracene | PAH | 3.1 | U | 3.1 | 3.0 | U | 3.0 | 29 | X | 3.3 | 3.3 | U | 3.3 |
| Benzo(a)pyrene | PAH | 6.3 | U | 6.3 | 6.1 | U | 6.1 | 42 | | 6.6 | 6.5 | U | 6.5 |
| Benzo(b)fluoranthene | PAH | 4.1 | U | 4.1 | 4.0 | U | 4.0 | 44 | | 4.3 | 4.3 | U | 4.3 |
| Benzo(ghi)perylene | PAH | 7.0 | U | 7.0 | 6.9 | U | 6.9 | 24 | J | 7.4 | 7.3 | U | 7.3 |
| Benzo(k)fluoranthene | PAH | 3.9 | U | 3.9 | 3.8 | U | 3.8 | 14 | J | 4.1 | 4.0 | U | 4.0 |
| Chrysene | PAH | 4.7 | U | 4.7 | 4.6 | U | 4.6 | 43 | | 5.0 | 4.9 | U | 4.9 |
| Dibenz[a,h]anthracene | PAH | 11 | U | 11 | 10 | U | 10 | 11 | U | 11 | 11 | U | 11 |
| Fluoranthene | PAH | 13 | U | 13 | 12 | U | 12 | 75 | | 13 | 13 | U | 13 |
| Fluorene | PAH | 5.2 | U | 5.2 | 5.0 | U | 5.0 | 11 | J | 5.4 | 5.4 | U | 5.4 |
| Indeno(1,2,3-cd)pyrene | PAH | 12 | U | 12 | 11 | U | 11 | 16 | JX | 12 | 12 | U | 12 |
| Naphthalene | PAH | 12 | U | 12 | 11 | U | 11 | 12 | U | 12 | 12 | U | 12 |
| Phenanthrene | PAH | 12 | U | 12 | 11 | U | 11 | 53 | | 12 | 12 | U | 12 |
| Pyrene | PAH | 12 | U | 12 | 11 | U | 11 | 79 | | 12 | 12 | U | 12 |
| Aroclor-1016 | PCB | 2.8 | U | 2.8 | 2.8 | U | 2.8 | 2.8 | U | 2.8 | 2.9 | U | 2.9 |
| Aroclor-1221 | PCB | 8.1 | U | 8.1 | 8.0 | U | 8.0 | 8.1 | U | 8.1 | 8.5 | U | 8.5 |
| Aroclor-1232 | PCB | 2.0 | U | 2.0 | 2.0 | U | 2.0 | 2.0 | U | 2.0 | 2.1 | U | 2.1 |
| Aroclor-1242 | PCB | 4.7 | U | 4.7 | 4.6 | U | 4.6 | 4.7 | U | 4.7 | 5.0 | U | 5.0 |
| Aroclor-1248 | PCB | 4.7 | U | 4.7 | 4.6 | U | 4.6 | 4.7 | U | 4.7 | 5.0 | U | 5.0 |
| Aroclor-1254 | PCB | 2.6 | U | 2.6 | 2.6 | U | 2.6 | 2.6 | U | 2.6 | 2.8 | U | 2.8 |
| Aroclor-1260 | PCB | 2.6 | U | 2.6 | 2.6 | U | 2.6 | 12 | | 2.6 | 2.8 | U | 2.8 |
| Aldrin | PEST | 0.25 | U | 0.25 | 0.25 | U | 0.25 | 0.26 | U | 0.26 | 0.24 | U | 0.24 |
| Alpha-BHC | PEST | 0.22 | U | 0.22 | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.21 | U | 0.21 |
| alpha-Chlordane | PEST | 0.33 | U | 0.33 | 0.32 | U | 0.32 | 0.33 | U | 0.33 | 0.31 | U | 0.31 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.67 | U | 0.67 | 0.66 | U | 0.66 | 0.68 | U | 0.68 | 0.65 | U | 0.65 |
| Delta-BHC | PEST | 0.40 | U | 0.40 | 0.40 | U | 0.40 | 0.41 | U | 0.41 | 0.39 | U | 0.39 |
| Dichlorodiphenyldichloroethane | PEST | 0.55 | U | 0.55 | 0.54 | U | 0.54 | 0.56 | U | 0.56 | 0.53 | U | 0.53 |
| Dichlorodiphenyldichloroethylene | PEST | 0.24 | U | 0.24 | 0.24 | U | 0.24 | 0.24 | U | 0.24 | 0.23 | U | 0.23 |
| Dichlorodiphenyltrichloroethane | PEST | 0.59 | U | 0.59 | 0.59 | U | 0.59 | 0.60 | U | 0.60 | 0.57 | U | 0.57 |
| Dieldrin | PEST | 0.21 | U | 0.21 | 0.21 | U | 0.21 | 0.21 | U | 0.21 | 0.20 | U | 0.20 |
| Endosulfan I | PEST | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.17 | U | 0.17 |
| Endosulfan II | PEST | 0.29 | U | 0.29 | 0.29 | U | 0.29 | 0.29 | U | 0.29 | 0.28 | U | 0.28 |
| Endosulfan sulfate | PEST | 0.28 | U | 0.28 | 0.28 | U | 0.28 | 0.28 | U | 0.28 | 0.27 | U | 0.27 |
| Endrin | PEST | 0.31 | U | 0.31 | 0.31 | U | 0.31 | 0.31 | U | 0.31 | 0.30 | U | 0.30 |
| Endrin aldehyde | PEST | 0.17 | U | 0.17 | 0.17 | U | 0.17 | 0.17 | U | 0.17 | 0.17 | U | 0.17 |
| Endrin ketone | PEST | 0.49 | U | 0.49 | 0.49 | U | 0.49 | 0.50 | U | 0.50 | 0.48 | U | 0.48 |
| Gamma-BHC (Lindane) | PEST | 0.47 | U | 0.47 | 0.46 | U | 0.46 | 0.47 | U | 0.47 | 0.45 | U | 0.45 |
| gamma-Chlordane | PEST | 0.27 | U | 0.27 | 0.27 | U | 0.27 | 0.27 | U | 0.27 | 0.26 | U | 0.26 |
| Heptachlor | PEST | 0.22 | U | 0.22 | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.21 | U | 0.21 |
| Heptachlor epoxide | PEST | 0.43 | U | 0.43 | 0.43 | U | 0.43 | 0.43 | U | 0.43 | 0.41 | U | 0.41 |
| Methoxychlor | PEST | 0.45 | U | 0.45 | 0.45 | U | 0.45 | 0.46 | U | 0.46 | 0.44 | U | 0.44 |
| Toxaphene | PEST | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 | 15 | U | 15 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 30 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Organics).**

| CONSTITUENT | CLASS | J1V4M3, SPA-9 | | | J1V4M4, SPA-10 | | | J1V4M5, SPA-11 | | | J1V4M6, SPA-12 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 02/26/15 | | | 02/26/15 | | | 04/02/15 | | | 04/02/15 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Acenaphthene | PAH | 27 | J | 10 | 11 | JX | 10 | 10 | U | 10 | 11 | U | 11 |
| Acenaphthylene | PAH | 9.0 | U | 9.0 | 9.2 | U | 9.2 | 9.0 | U | 9.0 | 9.5 | U | 9.5 |
| Anthracene | PAH | 3.1 | U | 3.1 | 3.1 | U | 3.1 | 3.0 | U | 3.0 | 3.2 | U | 3.2 |
| Benzo(a)anthracene | PAH | 51 | | 3.2 | 23 | | 3.2 | 3.2 | U | 3.2 | 6.2 | JX | 3.4 |
| Benzo(a)pyrene | PAH | 38 | | 6.4 | 26 | | 6.5 | 6.4 | U | 6.4 | 19 | | 6.8 |
| Benzo(b)fluoranthene | PAH | 31 | X | 4.2 | 28 | X | 4.3 | 4.2 | U | 4.2 | 22 | X | 4.5 |
| Benzo(ghi)perylene | PAH | 23 | J | 7.2 | 17 | J | 7.3 | 7.2 | U | 7.2 | 24 | J | 7.6 |
| Benzo(k)fluoranthene | PAH | 19 | | 4.0 | 9.5 | JX | 4 | 3.9 | U | 3.9 | 7.7 | J | 4.2 |
| Chrysene | PAH | 56 | | 4.9 | 26 | J | 4.9 | 4.8 | U | 4.8 | 22 | J | 5.1 |
| Dibenz[a,h]anthracene | PAH | 11 | U | 11 | 15 | J | 11 | 11 | U | 11 | 12 | U | 12 |
| Fluoranthene | PAH | 110 | X | 13 | 52 | | 13 | 13 | U | 13 | 52 | | 14 |
| Fluorene | PAH | 19 | J | 5.3 | 5.4 | U | 5.4 | 5.3 | U | 5.3 | 5.6 | U | 5.6 |
| Indeno(1,2,3-cd)pyrene | PAH | 12 | U | 12 | 22 | J | 12 | 12 | U | 12 | 18 | JX | 13 |
| Naphthalene | PAH | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 | 13 | U | 13 |
| Phenanthrene | PAH | 130 | | 12 | 37 | J | 12 | 12 | U | 12 | 34 | J | 13 |
| Pyrene | PAH | 120 | | 12 | 59 | | 12 | 12 | U | 12 | 46 | | 13 |
| Aroclor-1016 | PCB | 2.8 | U | 2.8 | 2.7 | U | 2.7 | 2.8 | U | 2.8 | 2.9 | U | 2.9 |
| Aroclor-1221 | PCB | 8.0 | U | 8.0 | 7.8 | U | 7.8 | 8.1 | U | 8.1 | 8.5 | U | 8.5 |
| Aroclor-1232 | PCB | 2.0 | U | 2.0 | 2.0 | U | 2.0 | 2.0 | U | 2.0 | 2.1 | U | 2.1 |
| Aroclor-1242 | PCB | 4.6 | U | 4.6 | 4.5 | U | 4.5 | 4.7 | U | 4.7 | 4.9 | U | 4.9 |
| Aroclor-1248 | PCB | 4.6 | U | 4.6 | 4.5 | U | 4.5 | 4.7 | U | 4.7 | 4.9 | U | 4.9 |
| Aroclor-1254 | PCB | 2.6 | U | 2.6 | 46 | | 2.5 | 2.6 | U | 2.6 | 2.7 | U | 2.7 |
| Aroclor-1260 | PCB | 2.6 | U | 2.6 | 2.5 | U | 2.5 | 2.6 | U | 2.6 | 2.7 | U | 2.7 |
| Aldrin | PEST | 0.25 | U | 0.25 | 0.25 | U | 0.25 | 0.25 | U | 0.25 | 0.26 | U | 0.26 |
| Alpha-BHC | PEST | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.22 | U | 0.22 |
| alpha-Chlordane | PEST | 0.32 | U | 0.32 | 0.33 | U | 0.33 | 0.33 | U | 0.33 | 0.34 | U | 0.34 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.65 | U | 0.65 | 0.67 | U | 0.67 | 0.67 | U | 0.67 | 0.70 | U | 0.70 |
| Delta-BHC | PEST | 0.39 | U | 0.39 | 0.40 | U | 0.40 | 0.40 | U | 0.40 | 0.42 | U | 0.42 |
| Dichlorodiphenyldichloroethane | PEST | 0.54 | U | 0.54 | 0.55 | U | 0.55 | 0.55 | U | 0.55 | 0.57 | U | 0.57 |
| Dichlorodiphenyldichloroethylene | PEST | 0.23 | U | 0.23 | 0.24 | U | 0.24 | 0.24 | U | 0.24 | 0.25 | U | 0.25 |
| Dichlorodiphenyltrichloroethane | PEST | 0.58 | U | 0.58 | 0.59 | U | 0.59 | 0.60 | U | 0.60 | 0.62 | U | 0.62 |
| Dieldrin | PEST | 0.21 | U | 0.21 | 0.21 | U | 0.21 | 0.21 | U | 0.21 | 0.22 | U | 0.22 |
| Endosulfan I | PEST | 0.17 | U | 0.17 | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.18 | U | 0.18 |
| Endosulfan II | PEST | 0.28 | U | 0.28 | 0.29 | U | 0.29 | 0.29 | U | 0.29 | 0.30 | U | 0.30 |
| Endosulfan sulfate | PEST | 0.27 | U | 0.27 | 0.28 | U | 0.28 | 0.28 | U | 0.28 | 0.29 | U | 0.29 |
| Endrin | PEST | 0.30 | U | 0.30 | 0.31 | U | 0.31 | 0.31 | U | 0.31 | 0.32 | U | 0.32 |
| Endrin aldehyde | PEST | 0.17 | U | 0.17 | 0.17 | U | 0.17 | 0.17 | U | 0.17 | 0.18 | U | 0.18 |
| Endrin ketone | PEST | 0.48 | U | 0.48 | 0.49 | U | 0.49 | 0.49 | U | 0.49 | 0.51 | U | 0.51 |
| Gamma-BHC (Lindane) | PEST | 0.46 | U | 0.46 | 0.47 | U | 0.47 | 0.47 | U | 0.47 | 0.49 | U | 0.49 |
| gamma-Chlordane | PEST | 0.26 | U | 0.26 | 0.27 | U | 0.27 | 0.27 | U | 0.27 | 0.28 | U | 0.28 |
| Heptachlor | PEST | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.22 | U | 0.22 |
| Heptachlor epoxide | PEST | 0.42 | U | 0.42 | 0.43 | U | 0.43 | 0.43 | U | 0.43 | 0.45 | U | 0.45 |
| Methoxychlor | PEST | 0.44 | U | 0.44 | 0.45 | U | 0.45 | 0.45 | U | 0.45 | 0.47 | U | 0.47 |
| Toxaphene | PEST | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 | 17 | U | 17 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 31 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Organics).**

| CONSTITUENT | CLASS | J1V4M7, SPA-13 | | | J1V4M8, SPA-14 | | | J1V4M9, SPA-15 | | | J1V4N1, OVB-9[a] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 02/26/15 | | | 02/26/15 | | | 04/02/15 | | | 02/26/15 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Acenaphthene | PAH | 10 | U | 10 | 9.8 | U | 9.8 | 10 | U | 10 | 10 | U | 10 |
| Acenaphthylene | PAH | 9.3 | U | 9.3 | 8.8 | U | 8.8 | 9.3 | U | 9.3 | 9.3 | U | 9.3 |
| Anthracene | PAH | 3.1 | U | 3.1 | 3.0 | U | 3.0 | 3.2 | U | 3.2 | 3.2 | U | 3.2 |
| Benzo(a)anthracene | PAH | 16 | | 3.3 | 8.9 | JX | 3.1 | 29 | | 3.3 | 9.4 | JX | 3.3 |
| Benzo(a)pyrene | PAH | 22 | | 6.6 | 9.3 | J | 6.3 | 30 | | 6.6 | 8.6 | J | 6.6 |
| Benzo(b)fluoranthene | PAH | 19 | | 4.3 | 7.7 | J | 4.1 | 35 | | 4.3 | 8.0 | J | 4.3 |
| Benzo(ghi)perylene | PAH | 14 | J | 7.4 | 7.1 | U | 7.1 | 41 | | 7.5 | 7.5 | U | 7.5 |
| Benzo(k)fluoranthene | PAH | 9.7 | J | 4.1 | 3.9 | U | 3.9 | 13 | J | 4.1 | 4.1 | U | 4.1 |
| Chrysene | PAH | 18 | J | 5.0 | 4.7 | U | 4.7 | 48 | | 5.0 | 8.7 | J | 5.0 |
| Dibenz[a,h]anthracene | PAH | 11 | U | 11 | 11 | U | 11 | 11 | U | 11 | 11 | U | 11 |
| Fluoranthene | PAH | 32 | J | 13 | 16 | J | 13 | 74 | | 13 | 17 | J | 13 |
| Fluorene | PAH | 5.4 | U | 5.4 | 5.2 | U | 5.2 | 5.5 | U | 5.5 | 5.5 | U | 5.5 |
| Indeno(1,2,3-cd)pyrene | PAH | 13 | JX | 12 | 12 | U | 12 | 30 | J | 12 | 12 | U | 12 |
| Naphthalene | PAH | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 |
| Phenanthrene | PAH | 17 | J | 12 | 12 | U | 12 | 41 | | 12 | 13 | J | 12 |
| Pyrene | PAH | 46 | | 12 | 22 | J | 12 | 71 | | 12 | 12 | U | 12 |
| Aroclor-1016 | PCB | 3.0 | U | 3.0 | 2.6 | U | 2.6 | 2.7 | U | 2.7 | 2.7 | U | 2.7 |
| Aroclor-1221 | PCB | 8.6 | U | 8.6 | 7.6 | U | 7.6 | 7.8 | U | 7.8 | 7.9 | U | 7.9 |
| Aroclor-1232 | PCB | 2.1 | U | 2.1 | 1.9 | U | 1.9 | 2.0 | U | 2.0 | 2.0 | U | 2.0 |
| Aroclor-1242 | PCB | 5.0 | U | 5.0 | 4.4 | U | 4.4 | 4.6 | U | 4.6 | 4.6 | U | 4.6 |
| Aroclor-1248 | PCB | 5.0 | U | 5.0 | 4.4 | U | 4.4 | 4.6 | U | 4.6 | 4.6 | U | 4.6 |
| Aroclor-1254 | PCB | 2.8 | U | 2.8 | 2.5 | U | 2.5 | 2.5 | U | 2.5 | 2.6 | U | 2.6 |
| Aroclor-1260 | PCB | 5.8 | J | 2.8 | 2.5 | U | 2.5 | 48 | | 2.5 | 2.6 | U | 2.6 |
| Aldrin | PEST | 0.26 | U | 0.26 | 0.25 | U | 0.25 | 0.26 | U | 0.26 | 0.25 | U | 0.25 |
| Alpha-BHC | PEST | 0.22 | U | 0.22 | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.21 | U | 0.21 |
| alpha-Chlordane | PEST | 0.34 | U | 0.34 | 0.32 | U | 0.32 | 0.33 | UN | 0.33 | 0.32 | U | 0.32 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.69 | U | 0.69 | 0.67 | U | 0.67 | 0.68 | U | 0.68 | 0.66 | U | 0.66 |
| Delta-BHC | PEST | 0.42 | U | 0.42 | 0.40 | U | 0.40 | 0.41 | U | 0.41 | 0.40 | U | 0.40 |
| Dichlorodiphenyldichloroethane | PEST | 0.57 | U | 0.57 | 0.55 | U | 0.55 | 0.56 | U | 0.56 | 0.54 | U | 0.54 |
| Dichlorodiphenyldichloroethylene | PEST | 0.25 | U | 0.25 | 0.24 | U | 0.24 | 1.7 | N | 0.24 | 1.0 | J | 0.24 |
| Dichlorodiphenyltrichloroethane | PEST | 0.61 | U | 0.61 | 0.59 | U | 0.59 | 2.7 | NX | 0.61 | 0.59 | U | 0.59 |
| Dieldrin | PEST | 0.22 | U | 0.22 | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.21 | U | 0.21 |
| Endosulfan I | PEST | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.18 | UN | 0.18 | 0.18 | U | 0.18 |
| Endosulfan II | PEST | 0.30 | U | 0.30 | 0.29 | U | 0.29 | 0.30 | UN | 0.30 | 0.29 | U | 0.29 |
| Endosulfan sulfate | PEST | 0.29 | U | 0.29 | 0.28 | U | 0.28 | 0.28 | UN | 0.28 | 0.27 | U | 0.27 |
| Endrin | PEST | 0.32 | U | 0.32 | 0.31 | U | 0.31 | 0.31 | U | 0.31 | 0.30 | U | 0.30 |
| Endrin aldehyde | PEST | 0.18 | U | 0.18 | 0.17 | U | 0.17 | 0.18 | U | 0.18 | 0.17 | U | 0.17 |
| Endrin ketone | PEST | 0.51 | U | 0.51 | 0.49 | U | 0.49 | 0.50 | UN | 0.50 | 0.49 | U | 0.49 |
| Gamma-BHC (Lindane) | PEST | 0.48 | U | 0.48 | 0.47 | U | 0.47 | 0.48 | U | 0.48 | 0.46 | U | 0.46 |
| gamma-Chlordane | PEST | 0.28 | U | 0.28 | 0.27 | U | 0.27 | 0.27 | U | 0.27 | 0.26 | U | 0.26 |
| Heptachlor | PEST | 0.22 | U | 0.22 | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.21 | U | 0.21 |
| Heptachlor epoxide | PEST | 0.44 | U | 0.44 | 0.43 | U | 0.43 | 0.44 | U | 0.44 | 0.42 | U | 0.42 |
| Methoxychlor | PEST | 0.47 | U | 0.47 | 0.45 | U | 0.45 | 0.46 | U | 0.46 | 0.45 | U | 0.45 |
| Toxaphene | PEST | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 32 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Organics).**

| CONSTITUENT | CLASS | J1V4N3, Duplicate of J1V4N1[a] | | | J1V255, OVB-1 | | | J1V256, OVB-2 | | | J1V257, OVB-3 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 02/26/15 | | | 12/10/14 | | | 12/10/14 | | | 12/10/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Acenaphthene | PAH | 10 | U | 10 | 11 | U | 11 | 10 | U | 10 | 10 | U | 10 |
| Acenaphthylene | PAH | 9.1 | U | 9.1 | 9.6 | U | 9.6 | 9.4 | U | 9.4 | 9.4 | U | 9.4 |
| Anthracene | PAH | 3.1 | U | 3.1 | 3.2 | U | 3.2 | 3.2 | U | 3.2 | 3.2 | U | 3.2 |
| Benzo(a)anthracene | PAH | 10 | J | 3.2 | 3.4 | U | 3.4 | 3.3 | U | 3.3 | 3.3 | U | 3.3 |
| Benzo(a)pyrene | PAH | 8.1 | J | 6.5 | 6.8 | U | 6.8 | 6.7 | U | 6.7 | 6.8 | J | 6.7 |
| Benzo(b)fluoranthene | PAH | 8.8 | J | 4.3 | 4.5 | U | 4.5 | 4.4 | U | 4.4 | 4.4 | U | 4.4 |
| Benzo(ghi)perylene | PAH | 7.3 | U | 7.3 | 7.6 | U | 7.6 | 7.5 | U | 7.5 | 7.5 | U | 7.5 |
| Benzo(k)fluoranthene | PAH | 4.0 | U | 4.0 | 4.2 | U | 4.2 | 4.1 | U | 4.1 | 4.1 | U | 4.1 |
| Chrysene | PAH | 8.9 | J | 4.9 | 5.1 | U | 5.1 | 5.1 | U | 5.1 | 6.8 | J | 5.1 |
| Dibenz[a,h]anthracene | PAH | 11 | U | 11 | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 |
| Fluoranthene | PAH | 20 | J | 13 | 14 | U | 14 | 14 | U | 14 | 14 | U | 14 |
| Fluorene | PAH | 5.4 | U | 5.4 | 5.6 | U | 5.6 | 5.5 | U | 5.5 | 5.5 | U | 5.5 |
| Indeno(1,2,3-cd)pyrene | PAH | 12 | U | 12 | 13 | U | 13 | 13 | U | 13 | 13 | U | 13 |
| Naphthalene | PAH | 12 | U | 12 | 13 | U | 13 | 13 | U | 13 | 13 | U | 13 |
| Phenanthrene | PAH | 12 | U | 12 | 13 | U | 13 | 13 | U | 13 | 13 | U | 13 |
| Pyrene | PAH | 19 | J | 12 | 13 | U | 13 | 13 | U | 13 | 18 | J | 13 |
| Aroclor-1016 | PCB | 2.7 | U | 2.7 | 3.0 | U | 3.0 | 2.9 | U | 2.9 | 3.0 | U | 3.0 |
| Aroclor-1221 | PCB | 7.9 | U | 7.9 | 8.7 | U | 8.7 | 8.4 | U | 8.4 | 8.6 | U | 8.6 |
| Aroclor-1232 | PCB | 2.0 | U | 2.0 | 2.2 | U | 2.2 | 2.1 | U | 2.1 | 2.2 | U | 2.2 |
| Aroclor-1242 | PCB | 4.6 | U | 4.6 | 5.0 | U | 5.0 | 4.9 | U | 4.9 | 5.0 | U | 5.0 |
| Aroclor-1248 | PCB | 4.6 | U | 4.6 | 5.0 | U | 5.0 | 4.9 | U | 4.9 | 5.0 | U | 5.0 |
| Aroclor-1254 | PCB | 2.6 | U | 2.6 | 2.8 | U | 2.8 | 2.7 | U | 2.7 | 2.8 | U | 2.8 |
| Aroclor-1260 | PCB | 2.6 | U | 2.6 | 2.8 | U | 2.8 | 2.7 | U | 2.7 | 2.8 | U | 2.8 |
| Aldrin | PEST | 0.25 | U | 0.25 | 0.27 | U | 0.27 | 0.26 | U | 0.26 | 0.27 | U | 0.27 |
| Alpha-BHC | PEST | 0.22 | U | 0.22 | 0.23 | U | 0.23 | 0.23 | U | 0.23 | 0.23 | U | 0.23 |
| alpha-Chlordane | PEST | 0.33 | U | 0.33 | 0.35 | U | 0.35 | 0.34 | U | 0.34 | 0.34 | U | 0.34 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.67 | U | 0.67 | 0.72 | U | 0.72 | 0.70 | U | 0.70 | 0.71 | U | 0.71 |
| Delta-BHC | PEST | 0.40 | U | 0.40 | 0.43 | U | 0.43 | 0.42 | U | 0.42 | 0.43 | U | 0.43 |
| Dichlorodiphenyldichloroethane | PEST | 0.55 | U | 0.55 | 0.59 | U | 0.59 | 0.58 | U | 0.58 | 0.58 | U | 0.58 |
| Dichlorodiphenyldichloroethylene | PEST | 0.81 | J | 0.24 | 0.26 | U | 0.26 | 0.25 | U | 0.25 | 0.25 | U | 0.25 |
| Dichlorodiphenyltrichloroethane | PEST | 0.59 | U | 0.59 | 0.64 | U | 0.64 | 0.62 | U | 0.62 | 0.63 | U | 0.63 |
| Dieldrin | PEST | 0.21 | U | 0.21 | 0.23 | U | 0.23 | 0.22 | U | 0.22 | 0.22 | U | 0.22 |
| Endosulfan I | PEST | 0.18 | U | 0.18 | 0.19 | U | 0.19 | 0.19 | U | 0.19 | 0.19 | U | 0.19 |
| Endosulfan II | PEST | 0.29 | U | 0.29 | 0.31 | U | 0.31 | 0.30 | U | 0.30 | 0.31 | U | 0.31 |
| Endosulfan sulfate | PEST | 0.28 | U | 0.28 | 0.30 | U | 0.30 | 0.29 | U | 0.29 | 0.29 | U | 0.29 |
| Endrin | PEST | 0.31 | U | 0.31 | 0.33 | U | 0.33 | 0.32 | U | 0.32 | 0.33 | U | 0.33 |
| Endrin aldehyde | PEST | 0.17 | U | 0.17 | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.18 | U | 0.18 |
| Endrin ketone | PEST | 0.49 | U | 0.49 | 0.53 | U | 0.53 | 0.52 | U | 0.52 | 0.52 | U | 0.52 |
| Gamma-BHC (Lindane) | PEST | 0.47 | U | 0.47 | 0.50 | U | 0.50 | 0.49 | U | 0.49 | 0.50 | U | 0.50 |
| gamma-Chlordane | PEST | 0.27 | U | 0.27 | 0.29 | U | 0.29 | 0.28 | U | 0.28 | 0.28 | U | 0.28 |
| Heptachlor | PEST | 0.22 | U | 0.22 | 0.23 | U | 0.23 | 0.23 | U | 0.23 | 0.23 | U | 0.23 |
| Heptachlor epoxide | PEST | 0.43 | U | 0.43 | 0.46 | U | 0.46 | 0.45 | U | 0.45 | 0.45 | U | 0.45 |
| Methoxychlor | PEST | 0.45 | U | 0.45 | 0.49 | U | 0.49 | 0.47 | U | 0.47 | 0.48 | U | 0.48 |
| Toxaphene | PEST | 16 | U | 16 | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 33 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Organics).**

| CONSTITUENT | CLASS | J1V258, OVB-4 | | | J1V259, OVB-5 | | | J1V260, OVB-6 | | | J1V261, OVB-7 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/10/14 | | | 12/10/14 | | | 12/10/14 | | | 12/10/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Acenaphthene | PAH | 11 | U | 11 | 11 | U | 11 | 10 | U | 10 | 10 | U | 10 |
| Acenaphthylene | PAH | 9.5 | U | 9.5 | 9.7 | U | 9.7 | 9.4 | U | 9.4 | 9.1 | U | 9.1 |
| Anthracene | PAH | 3.2 | U | 3.2 | 3.3 | U | 3.3 | 3.2 | U | 3.2 | 3.1 | U | 3.1 |
| Benzo(a)anthracene | PAH | 3.4 | U | 3.4 | 3.4 | U | 3.4 | 3.3 | U | 3.3 | 3.2 | U | 3.2 |
| Benzo(a)pyrene | PAH | 6.8 | U | 6.8 | 6.9 | U | 6.9 | 6.7 | U | 6.7 | 6.5 | U | 6.5 |
| Benzo(b)fluoranthene | PAH | 4.4 | U | 4.4 | 4.5 | U | 4.5 | 4.4 | U | 4.4 | 4.2 | U | 4.2 |
| Benzo(ghi)perylene | PAH | 7.6 | U | 7.6 | 7.7 | U | 7.7 | 7.5 | U | 7.5 | 7.3 | U | 7.3 |
| Benzo(k)fluoranthene | PAH | 4.2 | U | 4.2 | 4.2 | U | 4.2 | 4.1 | U | 4.1 | 4.0 | U | 4.0 |
| Chrysene | PAH | 5.1 | U | 5.1 | 5.2 | U | 5.2 | 5.0 | U | 5.0 | 4.9 | U | 4.9 |
| Dibenz[a,h]anthracene | PAH | 12 | U | 12 | 12 | U | 12 | 11 | U | 11 | 11 | U | 11 |
| Fluoranthene | PAH | 14 | U | 14 | 14 | U | 14 | 14 | U | 14 | 13 | U | 13 |
| Fluorene | PAH | 5.6 | U | 5.6 | 5.7 | U | 5.7 | 5.5 | U | 5.5 | 5.3 | U | 5.3 |
| Indeno(1,2,3-cd)pyrene | PAH | 13 | U | 13 | 13 | U | 13 | 12 | U | 12 | 12 | U | 12 |
| Naphthalene | PAH | 13 | U | 13 | 13 | U | 13 | 12 | U | 12 | 12 | U | 12 |
| Phenanthrene | PAH | 13 | U | 13 | 13 | U | 13 | 12 | U | 12 | 12 | U | 12 |
| Pyrene | PAH | 13 | U | 13 | 13 | U | 13 | 12 | U | 12 | 12 | U | 12 |
| Aroclor-1016 | PCB | 2.9 | U | 2.9 | 3.0 | U | 3.0 | 2.8 | U | 2.8 | 2.9 | U | 2.9 |
| Aroclor-1221 | PCB | 8.5 | U | 8.5 | 8.6 | U | 8.6 | 8.0 | U | 8.0 | 8.4 | U | 8.4 |
| Aroclor-1232 | PCB | 2.1 | U | 2.1 | 2.1 | U | 2.1 | 2.0 | U | 2.0 | 2.1 | U | 2.1 |
| Aroclor-1242 | PCB | 4.9 | U | 4.9 | 5.0 | U | 5.0 | 4.6 | U | 4.6 | 4.9 | U | 4.9 |
| Aroclor-1248 | PCB | 4.9 | U | 4.9 | 5.0 | U | 5.0 | 4.6 | U | 4.6 | 4.9 | U | 4.9 |
| Aroclor-1254 | PCB | 2.7 | U | 2.7 | 2.8 | U | 2.8 | 2.6 | U | 2.6 | 2.7 | U | 2.7 |
| Aroclor-1260 | PCB | 2.7 | U | 2.7 | 2.8 | U | 2.8 | 2.6 | U | 2.6 | 2.7 | U | 2.7 |
| Aldrin | PEST | 0.25 | U | 0.25 | 0.26 | U | 0.26 | 0.26 | U | 0.26 | 0.26 | U | 0.26 |
| Alpha-BHC | PEST | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.22 | U | 0.22 |
| alpha-Chlordane | PEST | 0.32 | U | 0.32 | 0.33 | U | 0.33 | 0.33 | U | 0.33 | 0.34 | U | 0.34 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.67 | U | 0.67 | 0.68 | U | 0.68 | 0.68 | U | 0.68 | 0.69 | U | 0.69 |
| Delta-BHC | PEST | 0.40 | U | 0.40 | 0.41 | U | 0.41 | 0.41 | U | 0.41 | 0.42 | U | 0.42 |
| Dichlorodiphenyldichloroethane | PEST | 0.55 | U | 0.55 | 0.56 | U | 0.56 | 0.56 | U | 0.56 | 0.57 | U | 0.57 |
| Dichlorodiphenyldichloroethylene | PEST | 0.24 | U | 0.24 | 0.24 | U | 0.24 | 0.24 | U | 0.24 | 0.25 | U | 0.25 |
| Dichlorodiphenyltrichloroethane | PEST | 0.59 | U | 0.59 | 0.61 | U | 0.61 | 0.60 | U | 0.60 | 0.61 | U | 0.61 |
| Dieldrin | PEST | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.21 | U | 0.21 | 0.22 | U | 0.22 |
| Endosulfan I | PEST | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.18 | U | 0.18 |
| Endosulfan II | PEST | 0.29 | U | 0.29 | 0.29 | U | 0.29 | 0.29 | U | 0.29 | 0.30 | U | 0.30 |
| Endosulfan sulfate | PEST | 0.28 | U | 0.28 | 0.28 | U | 0.28 | 0.28 | U | 0.28 | 0.29 | U | 0.29 |
| Endrin | PEST | 0.31 | U | 0.31 | 0.31 | U | 0.31 | 0.31 | U | 0.31 | 0.32 | U | 0.32 |
| Endrin aldehyde | PEST | 0.17 | U | 0.17 | 0.18 | U | 0.18 | 0.17 | U | 0.17 | 0.18 | U | 0.18 |
| Endrin ketone | PEST | 0.49 | U | 0.49 | 0.50 | U | 0.50 | 0.50 | U | 0.50 | 0.51 | U | 0.51 |
| Gamma-BHC (Lindane) | PEST | 0.47 | U | 0.47 | 0.48 | U | 0.48 | 0.47 | U | 0.47 | 0.48 | U | 0.48 |
| gamma-Chlordane | PEST | 0.27 | U | 0.27 | 0.27 | U | 0.27 | 0.27 | U | 0.27 | 0.28 | U | 0.28 |
| Heptachlor | PEST | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.22 | U | 0.22 |
| Heptachlor epoxide | PEST | 0.43 | U | 0.43 | 0.44 | U | 0.44 | 0.43 | U | 0.43 | 0.44 | U | 0.44 |
| Methoxychlor | PEST | 0.45 | U | 0.45 | 0.46 | U | 0.46 | 0.46 | U | 0.46 | 0.47 | U | 0.47 |
| Toxaphene | PEST | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 34 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Organics).**

| CONSTITUENT | CLASS | J1V262, OVB-8 | | | J1V264, OVB-10 | | | J1V265, OVB-11 | | | J1V4N2, OVB-12[a] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/10/14 | | | 12/10/14 | | | 12/10/14 | | | 02/26/15 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Acenaphthene | PAH | 10 | U | 10 | 10 | U | 10 | 11 | U | 11 | 13 | JX | 10 |
| Acenaphthylene | PAH | 9.2 | U | 9.2 | 9.1 | U | 9.1 | 9.5 | U | 9.5 | 9.2 | U | 9.2 |
| Anthracene | PAH | 3.1 | U | 3.1 | 3.1 | U | 3.1 | 3.2 | U | 3.2 | 3.1 | U | 3.1 |
| Benzo(a)anthracene | PAH | 3.3 | U | 3.3 | 3.2 | UN | 3.2 | 3.4 | U | 3.4 | 37 | | 3.3 |
| Benzo(a)pyrene | PAH | 6.6 | U | 6.6 | 6.5 | U | 6.5 | 6.8 | U | 6.8 | 33 | | 6.5 |
| Benzo(b)fluoranthene | PAH | 4.3 | U | 4.3 | 4.2 | UN | 4.2 | 4.4 | U | 4.4 | 32 | X | 4.3 |
| Benzo(ghi)perylene | PAH | 7.4 | U | 7.4 | 7.3 | U | 7.3 | 7.6 | U | 7.6 | 7.3 | U | 7.3 |
| Benzo(k)fluoranthene | PAH | 4.0 | U | 4.0 | 4.0 | UN | 4.0 | 4.2 | U | 4.2 | 13 | J | 4.0 |
| Chrysene | PAH | 5.0 | U | 5.0 | 4.9 | U | 4.9 | 5.1 | U | 5.1 | 37 | J | 4.9 |
| Dibenz[a,h]anthracene | PAH | 11.0 | U | 11 | 11 | UN | 11 | 12 | U | 12 | 11 | U | 11 |
| Fluoranthene | PAH | 13 | U | 13 | 13 | UN | 13 | 14 | U | 14 | 58 | | 13 |
| Fluorene | PAH | 5.4 | U | 5.4 | 5.3 | U | 5.3 | 5.6 | U | 5.6 | 5.4 | U | 5.4 |
| Indeno(1,2,3-cd)pyrene | PAH | 12 | U | 12 | 12 | U | 12 | 13 | U | 13 | 28 | J | 12 |
| Naphthalene | PAH | 12 | U | 12 | 12 | U | 12 | 13 | U | 13 | 12 | U | 12 |
| Phenanthrene | PAH | 12 | U | 12 | 12 | U | 12 | 13 | U | 13 | 43 | | 12 |
| Pyrene | PAH | 12 | U | 12 | 12 | U | 12 | 13 | U | 13 | 68 | | 12 |
| Aroclor-1016 | PCB | 2.8 | U | 2.8 | 2.7 | U | 2.7 | 2.8 | U | 2.8 | 2.7 | U | 2.7 |
| Aroclor-1221 | PCB | 8.2 | U | 8.2 | 8.0 | U | 8.0 | 8.0 | U | 8.0 | 7.8 | U | 7.8 |
| Aroclor-1232 | PCB | 2.0 | U | 2.0 | 2.0 | U | 2.0 | 2.0 | U | 2.0 | 1.9 | U | 1.9 |
| Aroclor-1242 | PCB | 4.8 | U | 4.8 | 4.6 | U | 4.6 | 4.6 | U | 4.6 | 4.5 | U | 4.5 |
| Aroclor-1248 | PCB | 4.8 | U | 4.8 | 4.6 | U | 4.6 | 4.6 | U | 4.6 | 4.5 | U | 4.5 |
| Aroclor-1254 | PCB | 2.7 | U | 2.7 | 2.6 | U | 2.6 | 2.6 | U | 2.6 | 2.5 | U | 2.5 |
| Aroclor-1260 | PCB | 2.7 | U | 2.7 | 2.6 | U | 2.6 | 2.6 | U | 2.6 | 2.5 | U | 2.5 |
| Aldrin | PEST | 0.25 | U | 0.25 | 0.25 | U | 0.25 | 0.26 | U | 0.26 | 0.25 | U | 0.25 |
| Alpha-BHC | PEST | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.21 | U | 0.21 |
| alpha-Chlordane | PEST | 0.32 | U | 0.32 | 0.33 | U | 0.33 | 0.34 | U | 0.34 | 0.32 | U | 0.32 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.66 | U | 0.66 | 0.67 | U | 0.67 | 0.69 | U | 0.69 | 0.65 | U | 0.65 |
| Delta-BHC | PEST | 0.40 | U | 0.40 | 0.40 | U | 0.40 | 0.42 | U | 0.42 | 0.39 | U | 0.39 |
| Dichlorodiphenyldichloroethane | PEST | 0.54 | U | 0.54 | 0.55 | U | 0.55 | 0.57 | U | 0.57 | 0.53 | U | 0.53 |
| Dichlorodiphenyldichloroethylene | PEST | 0.24 | U | 0.24 | 0.24 | U | 0.24 | 0.25 | U | 0.25 | 0.23 | U | 0.23 |
| Dichlorodiphenyltrichloroethane | PEST | 0.59 | U | 0.59 | 0.59 | U | 0.59 | 0.61 | U | 0.61 | 0.58 | U | 0.58 |
| Dieldrin | PEST | 0.21 | U | 0.21 | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.21 | U | 0.21 |
| Endosulfan I | PEST | 0.17 | U | 0.17 | 0.18 | U | 0.18 | 0.18 | U | 0.18 | 0.17 | U | 0.17 |
| Endosulfan II | PEST | 0.29 | U | 0.29 | 0.29 | U | 0.29 | 0.30 | U | 0.30 | 0.28 | U | 0.28 |
| Endosulfan sulfate | PEST | 0.27 | U | 0.27 | 0.28 | U | 0.28 | 0.29 | U | 0.29 | 0.27 | U | 0.27 |
| Endrin | PEST | 0.30 | U | 0.30 | 0.31 | U | 0.31 | 0.32 | U | 0.32 | 0.30 | U | 0.30 |
| Endrin aldehyde | PEST | 0.17 | U | 0.17 | 0.17 | U | 0.17 | 0.18 | U | 0.18 | 0.17 | U | 0.17 |
| Endrin ketone | PEST | 0.49 | U | 0.49 | 0.49 | U | 0.49 | 0.51 | U | 0.51 | 0.48 | U | 0.48 |
| Gamma-BHC (Lindane) | PEST | 0.46 | U | 0.46 | 0.47 | U | 0.47 | 0.48 | U | 0.48 | 0.45 | U | 0.45 |
| gamma-Chlordane | PEST | 0.26 | U | 0.26 | 0.27 | U | 0.27 | 0.28 | U | 0.28 | 0.26 | U | 0.26 |
| Heptachlor | PEST | 0.21 | U | 0.21 | 0.22 | U | 0.22 | 0.22 | U | 0.22 | 0.21 | U | 0.21 |
| Heptachlor epoxide | PEST | 0.42 | U | 0.42 | 0.43 | U | 0.43 | 0.44 | U | 0.44 | 0.42 | U | 0.42 |
| Methoxychlor | PEST | 0.45 | U | 0.45 | 0.45 | U | 0.45 | 0.47 | U | 0.47 | 0.44 | U | 0.44 |
| Toxaphene | PEST | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 | 15 | U | 15 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 35 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Organics).**

| CONSTITUENT | CLASS | J1V263, OVB-9 | | | J1V267, Duplicate of J1V263 | | | J1V266, OVB-12 | | | J1V281, FS-1 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/10/14 | | | 12/10/14 | | | 12/10/14 | | | 12/15/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Acenaphthene | PAH | 10 | U | 10 | 11 | U | 11 | 190 | JXD | 54 | 11 | U | 11 |
| Acenaphthylene | PAH | 9.4 | U | 9.4 | 9.6 | U | 9.6 | 49 | UD | 49 | 9.8 | U | 9.8 |
| Anthracene | PAH | 3.2 | U | 3.2 | 3.2 | U | 3.2 | 17 | UD | 17 | 3.3 | U | 3.3 |
| Benzo(a)anthracene | PAH | 3.3 | U | 3.3 | 3.4 | U | 3.4 | 780 | D | 17 | 3.5 | U | 3.5 |
| Benzo(a)pyrene | PAH | 24 | | 6.7 | 6.8 | U | 6.8 | 640 | D | 35 | 7.0 | U | 7.0 |
| Benzo(b)fluoranthene | PAH | 22 | X | 4.4 | 4.5 | U | 4.5 | 590 | D | 23 | 4.6 | U | 4.6 |
| Benzo(ghi)perylene | PAH | 17 | J | 7.5 | 7.7 | U | 7.7 | 450 | D | 39 | 7.9 | U | 7.9 |
| Benzo(k)fluoranthene | PAH | 8.9 | J | 4.1 | 4.2 | U | 4.2 | 230 | D | 21 | 4.3 | U | 4.3 |
| Chrysene | PAH | 18 | J | 5.1 | 5.2 | U | 5.2 | 650 | D | 26 | 5.3 | U | 5.3 |
| Dibenz[a,h]anthracene | PAH | 11 | U | 11 | 12 | U | 12 | 200 | D | 60 | 12 | U | 12 |
| Fluoranthene | PAH | 41 | J | 14 | 14 | U | 14 | 1400 | D | 70 | 14 | U | 14 |
| Fluorene | PAH | 5.5 | U | 5.5 | 5.6 | U | 5.6 | 170 | D | 29 | 5.8 | U | 5.8 |
| Indeno(1,2,3-cd)pyrene | PAH | 18 | J | 13 | 13 | U | 13 | 410 | D | 65 | 13 | U | 13 |
| Naphthalene | PAH | 13 | U | 13 | 13 | U | 13 | 65 | UD | 65 | 13 | U | 13 |
| Phenanthrene | PAH | 26 | J | 13 | 13 | U | 13 | 1100 | D | 65 | 13 | U | 13 |
| Pyrene | PAH | 39 | J | 13 | 13 | U | 13 | 1300 | D | 65 | 13 | U | 13 |
| Aroclor-1016 | PCB | 3.0 | U | 3.0 | 2.8 | U | 2.8 | 2.8 | U | 2.8 | 3.0 | U | 3.0 |
| Aroclor-1221 | PCB | 8.8 | U | 8.8 | 8.1 | U | 8.1 | 8.2 | U | 8.2 | 8.7 | U | 8.7 |
| Aroclor-1232 | PCB | 2.2 | U | 2.2 | 2.0 | U | 2.0 | 2.1 | U | 2.1 | 2.2 | U | 2.2 |
| Aroclor-1242 | PCB | 5.1 | U | 5.1 | 4.7 | U | 4.7 | 4.8 | U | 4.8 | 5.1 | U | 5.1 |
| Aroclor-1248 | PCB | 5.1 | U | 5.1 | 4.7 | U | 4.7 | 4.8 | U | 4.8 | 5.1 | U | 5.1 |
| Aroclor-1254 | PCB | 2.8 | U | 2.8 | 2.6 | U | 2.6 | 2.7 | U | 2.7 | 2.8 | U | 2.8 |
| Aroclor-1260 | PCB | 2.8 | U | 2.8 | 2.6 | U | 2.6 | 2.7 | U | 2.7 | 34 | | 2.8 |
| Aldrin | PEST | 0.27 | U | 0.27 | 0.27 | U | 0.27 | 0.26 | U | 0.26 | 0.27 | U | 0.27 |
| Alpha-BHC | PEST | 0.23 | U | 0.23 | 0.23 | U | 0.23 | 0.22 | U | 0.22 | 0.23 | U | 0.23 |
| alpha-Chlordane | PEST | 0.35 | U | 0.35 | 0.34 | U | 0.34 | 0.33 | U | 0.33 | 0.35 | U | 0.35 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.73 | U | 0.73 | 0.70 | U | 0.70 | 0.67 | U | 0.67 | 0.72 | U | 0.72 |
| Delta-BHC | PEST | 0.44 | U | 0.44 | 0.42 | U | 0.42 | 0.41 | U | 0.41 | 0.44 | U | 0.44 |
| Dichlorodiphenyldichloroethane | PEST | 0.60 | U | 0.60 | 0.58 | U | 0.58 | 0.55 | U | 0.55 | 0.59 | U | 0.59 |
| Dichlorodiphenyldichloroethylene | PEST | 0.26 | U | 0.26 | 0.25 | U | 0.25 | 0.60 | J | 0.24 | 0.26 | U | 0.26 |
| Dichlorodiphenyltrichloroethane | PEST | 0.64 | U | 0.64 | 0.62 | U | 0.62 | 0.91 | JX | 0.60 | 0.64 | U | 0.64 |
| Dieldrin | PEST | 0.23 | U | 0.23 | 0.22 | U | 0.22 | 0.21 | U | 0.21 | 0.23 | U | 0.23 |
| Endosulfan I | PEST | 0.19 | U | 0.19 | 0.19 | U | 0.19 | 0.18 | U | 0.18 | 0.19 | U | 0.19 |
| Endosulfan II | PEST | 0.31 | U | 0.31 | 0.30 | U | 0.30 | 0.29 | U | 0.29 | 0.31 | U | 0.31 |
| Endosulfan sulfate | PEST | 0.30 | U | 0.30 | 0.29 | U | 0.29 | 0.28 | U | 0.28 | 0.30 | U | 0.30 |
| Endrin | PEST | 0.33 | U | 0.33 | 0.32 | U | 0.32 | 0.31 | U | 0.31 | 0.33 | U | 0.33 |
| Endrin aldehyde | PEST | 0.19 | U | 0.19 | 0.18 | U | 0.18 | 0.17 | U | 0.17 | 0.19 | U | 0.19 |
| Endrin ketone | PEST | 0.53 | U | 0.53 | 0.52 | U | 0.52 | 0.50 | U | 0.50 | 0.53 | U | 0.53 |
| Gamma-BHC (Lindane) | PEST | 0.51 | U | 0.51 | 0.49 | U | 0.49 | 0.47 | U | 0.47 | 0.51 | U | 0.51 |
| gamma-Chlordane | PEST | 0.29 | U | 0.29 | 0.28 | U | 0.28 | 0.27 | U | 0.27 | 0.29 | U | 0.29 |
| Heptachlor | PEST | 0.23 | U | 0.23 | 0.23 | U | 0.23 | 0.22 | U | 0.22 | 0.23 | U | 0.23 |
| Heptachlor epoxide | PEST | 0.47 | U | 0.47 | 0.45 | U | 0.45 | 0.43 | U | 0.43 | 0.46 | U | 0.46 |
| Methoxychlor | PEST | 0.49 | U | 0.49 | 0.48 | U | 0.48 | 0.46 | U | 0.46 | 0.49 | U | 0.49 |
| Toxaphene | PEST | 17 | U | 17 | 17 | U | 17 | 16 | U | 16 | 17 | U | 17 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 36 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Organics).**

| CONSTITUENT | CLASS | J1V282, FS-2 | | | J1V283, FS-3 | | | J1V284, FS-4 | | | J1TF83, RC-1 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/15/14 | | | 12/15/14 | | | 12/15/14 | | | 02/26/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Acenaphthene | PAH | 10 | U | 10 | 13 | J | 11 | 10 | U | 10 | | | |
| Acenaphthylene | PAH | 9.0 | U | 9.0 | 9.5 | U | 9.5 | 9.0 | U | 9.0 | | | |
| Anthracene | PAH | 3.1 | U | 3.1 | 3.2 | U | 3.2 | 3.1 | U | 3.1 | | | |
| Benzo(a)anthracene | PAH | 3.2 | U | 3.2 | 24 | | 3.3 | 3.2 | U | 3.2 | | | |
| Benzo(a)pyrene | PAH | 6.4 | U | 6.4 | 27 | | 6.7 | 6.4 | U | 6.4 | | | |
| Benzo(b)fluoranthene | PAH | 4.2 | U | 4.2 | 26 | | 4.4 | 4.2 | U | 4.2 | | | |
| Benzo(ghi)perylene | PAH | 7.2 | U | 7.2 | 8.0 | J | 7.6 | 7.2 | U | 7.2 | | | |
| Benzo(k)fluoranthene | PAH | 3.9 | U | 3.9 | 10 | J | 4.1 | 3.9 | U | 3.9 | | | |
| Chrysene | PAH | 4.8 | U | 4.8 | 21 | J | 5.1 | 4.9 | U | 4.9 | | | |
| Dibenz[a,h]anthracene | PAH | 11 | U | 11 | 12 | U | 12 | 11 | U | 11 | | | |
| Fluoranthene | PAH | 13 | U | 13 | 59 | | 14 | 13 | U | 13 | | | |
| Fluorene | PAH | 5.3 | U | 5.3 | 12 | J | 5.5 | 5.3 | U | 5.3 | | | |
| Indeno(1,2,3-cd)pyrene | PAH | 12 | U | 12 | 23 | J | 13 | 12 | U | 12 | | | |
| Naphthalene | PAH | 12 | U | 12 | 13 | U | 13 | 12 | U | 12 | | | |
| Phenanthrene | PAH | 12 | U | 12 | 48 | | 13 | 12 | U | 12 | | | |
| Pyrene | PAH | 12 | U | 12 | 59 | | 13 | 12 | U | 12 | | | |
| Aroclor-1016 | PCB | 2.7 | U | 2.7 | 3.0 | U | 3.0 | 2.8 | U | 2.8 | 2.8 | U | 2.8 |
| Aroclor-1221 | PCB | 7.9 | U | 7.9 | 8.6 | U | 8.6 | 8.0 | U | 8.0 | 8.1 | U | 8.1 |
| Aroclor-1232 | PCB | 2.0 | U | 2.0 | 2.1 | U | 2.1 | 2.0 | U | 2.0 | 2.0 | U | 2.0 |
| Aroclor-1242 | PCB | 4.6 | U | 4.6 | 5.0 | U | 5.0 | 4.7 | U | 4.7 | 4.7 | U | 4.7 |
| Aroclor-1248 | PCB | 4.6 | U | 4.6 | 5.0 | U | 5.0 | 4.7 | U | 4.7 | 4.7 | U | 4.7 |
| Aroclor-1254 | PCB | 2.6 | U | 2.6 | 2.8 | U | 2.8 | 10 | | 2.6 | 2.6 | U | 2.6 |
| Aroclor-1260 | PCB | 2.6 | U | 2.6 | 20 | | 2.8 | 2.6 | U | 2.6 | 2.6 | U | 2.6 |
| Aldrin | PEST | 0.24 | U | 0.24 | 0.28 | U | 0.28 | 0.26 | U | 0.26 | 0.25 | U | 0.25 |
| Alpha-BHC | PEST | 0.20 | U | 0.20 | 0.24 | U | 0.24 | 0.22 | U | 0.22 | 0.21 | U | 0.21 |
| alpha-Chlordane | PEST | 0.31 | U | 0.31 | 0.36 | U | 0.36 | 0.33 | U | 0.33 | 0.32 | U | 0.32 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.64 | U | 0.64 | 0.73 | U | 0.73 | 0.69 | U | 0.69 | 0.66 | U | 0.66 |
| Delta-BHC | PEST | 0.38 | U | 0.38 | 0.44 | U | 0.44 | 0.41 | U | 0.41 | 0.40 | U | 0.40 |
| Dichlorodiphenyldichloroethane | PEST | 0.52 | U | 0.52 | 0.60 | U | 0.60 | 0.56 | U | 0.56 | 0.54 | U | 0.54 |
| Dichlorodiphenyldichloroethylene | PEST | 0.23 | U | 0.23 | 0.26 | U | 0.26 | 0.25 | U | 0.25 | 0.24 | U | 0.24 |
| Dichlorodiphenyltrichloroethane | PEST | 0.57 | U | 0.57 | 0.65 | U | 0.65 | 0.61 | U | 0.61 | 0.59 | U | 0.59 |
| Dieldrin | PEST | 0.20 | U | 0.20 | 0.23 | U | 0.23 | 0.22 | U | 0.22 | 0.21 | U | 0.21 |
| Endosulfan I | PEST | 0.17 | U | 0.17 | 0.19 | U | 0.19 | 0.18 | U | 0.18 | 0.17 | U | 0.17 |
| Endosulfan II | PEST | 0.27 | U | 0.27 | 0.32 | U | 0.32 | 0.30 | U | 0.30 | 0.28 | U | 0.28 |
| Endosulfan sulfate | PEST | 0.26 | U | 0.26 | 0.30 | U | 0.30 | 0.28 | U | 0.28 | 0.27 | U | 0.27 |
| Endrin | PEST | 0.29 | U | 0.29 | 0.34 | U | 0.34 | 0.32 | U | 0.32 | 0.30 | U | 0.30 |
| Endrin aldehyde | PEST | 0.16 | U | 0.16 | 0.19 | U | 0.19 | 0.18 | U | 0.18 | 0.17 | U | 0.17 |
| Endrin ketone | PEST | 0.47 | U | 0.47 | 0.54 | U | 0.54 | 0.50 | U | 0.50 | 0.49 | U | 0.49 |
| Gamma-BHC (Lindane) | PEST | 0.44 | U | 0.44 | 0.51 | U | 0.51 | 0.48 | U | 0.48 | 0.46 | U | 0.46 |
| gamma-Chlordane | PEST | 0.25 | U | 0.25 | 0.29 | U | 0.29 | 0.27 | U | 0.27 | 0.26 | U | 0.26 |
| Heptachlor | PEST | 0.20 | U | 0.20 | 0.24 | U | 0.24 | 0.22 | U | 0.22 | 0.21 | U | 0.21 |
| Heptachlor epoxide | PEST | 0.41 | U | 0.41 | 0.47 | U | 0.47 | 0.44 | U | 0.44 | 0.42 | U | 0.42 |
| Methoxychlor | PEST | 0.43 | U | 0.43 | 0.50 | U | 0.50 | 0.46 | U | 0.46 | 0.45 | U | 0.45 |
| Toxaphene | PEST | 15 | UJ | 15 | 17 | UJ | 17 | 16 | UJ | 16 | 16 | UJ | 16 |

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| Attachment | 1 | Sheet No. | 37 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (Organics).**

| CONSTITUENT | CLASS | J1TF82, RC-2 | | | J1T5W6, RC-3 | | |
|---|---|---|---|---|---|---|---|
| | | 02/26/14 | | | 11/18/13 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL |
| Aroclor-1016 | PCB | 3.2 | U | 3.2 | 2.9 | U | 2.9 |
| Aroclor-1221 | PCB | 9.2 | U | 9.2 | 8.3 | U | 8.3 |
| Aroclor-1232 | PCB | 2.3 | U | 2.3 | 2.1 | U | 2.1 |
| Aroclor-1242 | PCB | 5.3 | U | 5.3 | 4.8 | U | 4.8 |
| Aroclor-1248 | PCB | 5.3 | U | 5.3 | 4.8 | U | 4.8 |
| Aroclor-1254 | PCB | 3.0 | U | 3.0 | 2.7 | U | 2.7 |
| Aroclor-1260 | PCB | 10 | J | 3.0 | 2.7 | U | 2.7 |
| Aldrin | PEST | 0.27 | U | 0.27 | 0.25 | U | 0.25 |
| Alpha-BHC | PEST | 0.23 | U | 0.23 | 0.21 | U | 0.21 |
| alpha-Chlordane | PEST | 0.35 | U | 0.35 | 0.32 | UN | 0.32 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | PEST | 0.73 | U | 0.73 | 0.67 | UN | 0.67 |
| Delta-BHC | PEST | 0.44 | U | 0.44 | 0.40 | UN | 0.40 |
| Dichlorodiphenyldichloroethane | PEST | 0.60 | U | 0.60 | 0.55 | U | 0.55 |
| Dichlorodiphenyldichloroethylene | PEST | 0.26 | U | 0.26 | 0.24 | UN | 0.24 |
| Dichlorodiphenyltrichloroethane | PEST | 0.65 | U | 0.65 | 0.59 | U | 0.59 |
| Dieldrin | PEST | 0.23 | U | 0.23 | 0.21 | UN | 0.21 |
| Endosulfan I | PEST | 0.19 | U | 0.19 | 0.18 | UN | 0.18 |
| Endosulfan II | PEST | 0.31 | U | 0.31 | 0.29 | UN | 0.29 |
| Endosulfan sulfate | PEST | 0.30 | U | 0.30 | 0.28 | UN | 0.28 |
| Endrin | PEST | 0.34 | U | 0.34 | 0.31 | UN | 0.31 |
| Endrin aldehyde | PEST | 0.19 | U | 0.19 | 0.17 | UN | 0.17 |
| Endrin ketone | PEST | 0.54 | U | 0.54 | 0.49 | UN | 0.49 |
| Gamma-BHC (Lindane) | PEST | 0.51 | U | 0.51 | 0.47 | U | 0.47 |
| gamma-Chlordane | PEST | 0.29 | U | 0.29 | 0.27 | UN | 0.27 |
| Heptachlor | PEST | 0.23 | U | 0.23 | 0.21 | U | 0.21 |
| Heptachlor epoxide | PEST | 0.47 | U | 0.47 | 0.43 | UN | 0.43 |
| Methoxychlor | PEST | 0.49 | U | 0.49 | 0.45 | UN | 0.45 |
| Toxaphene | PEST | 17 | U | 17 | 16 | U | 16 |

| | | | |
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| Attachment | 1 | Sheet No. | 38 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1V272, EXC1-4 | | | J1V285, Duplicate of J1V272 | | | J1V543, EXC1-1[a] | | | J1V270, EXC1-2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/15/14 | | | 12/15/14 | | | 03/16/15 | | | 12/15/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 30 | U | 30 | 30 | U | 30 | 29 | U | 29 | 29 | U | 29 |
| 1,2-Dichlorobenzene | SVOA | 24 | U | 24 | 23 | U | 23 | 23 | U | 23 | 23 | U | 23 |
| 1,3-Dichlorobenzene | SVOA | 13 | U | 13 | 13 | U | 13 | 12 | U | 12 | 12 | U | 12 |
| 1,4-Dichlorobenzene | SVOA | 15 | U | 15 | 14 | U | 14 | 14 | U | 14 | 14 | U | 14 |
| 2,4,5-Trichlorophenol | SVOA | 11 | U | 11 | 11 | U | 11 | 10 | U | 10 | 10 | U | 10 |
| 2,4,6-Trichlorophenol | SVOA | 11 | U | 11 | 11 | U | 11 | 10 | U | 10 | 10 | U | 10 |
| 2,4-Dichlorophenol | SVOA | 11 | U | 11 | 11 | U | 11 | 10 | U | 10 | 10 | U | 10 |
| 2,4-Dimethylphenol | SVOA | 71 | U | 71 | 70 | U | 70 | 68 | U | 68 | 68 | U | 68 |
| 2,4-Dinitrophenol | SVOA | 360 | U | 360 | 350 | U | 350 | 340 | U | 340 | 340 | U | 340 |
| 2,4-Dinitrotoluene | SVOA | 71 | U | 71 | 70 | U | 70 | 68 | U | 68 | 68 | U | 68 |
| 2,6-Dinitrotoluene | SVOA | 30 | U | 30 | 30 | U | 30 | 29 | U | 29 | 29 | U | 29 |
| 2-Chloronaphthalene | SVOA | 11 | U | 11 | 11 | U | 11 | 10 | U | 10 | 10 | U | 10 |
| 2-Chlorophenol | SVOA | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 |
| 2-Methylnaphthalene | SVOA | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 |
| 2-Methylphenol (cresol, o-) | SVOA | 14 | U | 14 | 14 | U | 14 | 13 | U | 13 | 13 | U | 13 |
| 2-Nitroaniline | SVOA | 53 | U | 53 | 53 | U | 53 | 51 | U | 51 | 52 | U | 52 |
| 2-Nitrophenol | SVOA | 11 | U | 11 | 11 | U | 11 | 10 | U | 10 | 10 | U | 10 |
| 3,3'-Dichlorobenzidine | SVOA | 96 | U | 96 | 96 | U | 96 | 93 | U | 93 | 93 | U | 93 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 35 | U | 35 | 35 | U | 35 | 34 | U | 34 | 34 | U | 34 |
| 3-Nitroaniline | SVOA | 78 | U | 78 | 78 | U | 78 | 75 | U | 75 | 76 | U | 76 |
| 4,6-Dinitro-2-methylphenol | SVOA | 350 | U | 350 | 350 | U | 350 | 340 | U | 340 | 340 | U | 340 |
| 4-Bromophenylphenyl ether | SVOA | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 |
| 4-Chloro-3-methylphenol | SVOA | 71 | U | 71 | 70 | U | 70 | 68 | U | 68 | 68 | U | 68 |
| 4-Chloroaniline | SVOA | 88 | UJ | 88 | 87 | UJ | 87 | 84 | U | 84 | 85 | UJ | 85 |
| 4-Chlorophenylphenyl ether | SVOA | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 |
| 4-Nitroaniline | SVOA | 77 | U | 77 | 77 | U | 77 | 75 | U | 75 | 75 | U | 75 |
| 4-Nitrophenol | SVOA | 100 | U | 100 | 100 | U | 100 | 100 | U | 100 | 100 | U | 100 |
| Acenaphthene | SVOA | 11 | U | 11 | 11 | U | 11 | 11 | U | 11 | 11 | U | 11 |
| Acenaphthylene | SVOA | 18 | U | 18 | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 |
| Anthracene | SVOA | 18 | U | 18 | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 |
| Benzo(a)anthracene | SVOA | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 | 41 | J | 21 |
| Benzo(a)pyrene | SVOA | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 | 38 | J | 21 |
| Benzo(b)fluoranthene | SVOA | 28 | U | 28 | 28 | U | 28 | 27 | U | 27 | 53 | J | 27 |
| Benzo(ghi)perylene | SVOA | 17 | U | 17 | 17 | U | 17 | 16 | U | 16 | 31 | J | 17 |
| Benzo(k)fluoranthene | SVOA | 43 | U | 43 | 43 | U | 43 | 41 | U | 41 | 41 | U | 41 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 25 | U | 25 | 25 | U | 25 | 24 | U | 24 | 24 | U | 24 |
| Bis(2-Chloroethoxy)methane | SVOA | 25 | U | 25 | 25 | U | 25 | 24 | U | 24 | 24 | U | 24 |
| Bis(2-chloroethyl) ether | SVOA | 18 | U | 18 | 18 | U | 18 | 17 | U | 17 | 17 | U | 17 |
| Bis(2-ethylhexyl) phthalate | SVOA | 49 | U | 49 | 49 | U | 49 | 47 | U | 47 | 48 | U | 48 |
| Butylbenzylphthalate | SVOA | 46 | U | 46 | 46 | U | 46 | 44 | U | 44 | 45 | U | 45 |
| Carbazole | SVOA | 38 | U | 38 | 38 | U | 38 | 37 | U | 37 | 37 | U | 37 |
| Chrysene | SVOA | 29 | U | 29 | 29 | U | 29 | 28 | U | 28 | 41 | J | 28 |
| Dibenz[a,h]anthracene | SVOA | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 |
| Dibenzofuran | SVOA | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 |
| Diethyl phthalate | SVOA | 28 | U | 28 | 28 | U | 28 | 27 | U | 27 | 27 | U | 27 |
| Dimethyl phthalate | SVOA | 25 | U | 25 | 25 | U | 25 | 24 | U | 24 | 24 | U | 24 |
| Di-n-butylphthalate | SVOA | 31 | U | 31 | 31 | U | 31 | 30 | U | 30 | 30 | U | 30 |
| Di-n-octylphthalate | SVOA | 15 | U | 15 | 15 | U | 15 | 15 | U | 15 | 15 | U | 15 |
| Fluoranthene | SVOA | 38 | U | 38 | 38 | U | 38 | 37 | U | 37 | 72 | J | 37 |
| Fluorene | SVOA | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 |
| Hexachlorobenzene | SVOA | 31 | U | 31 | 31 | U | 31 | 30 | U | 30 | 30 | U | 30 |
| Hexachlorobutadiene | SVOA | 11 | U | 11 | 11 | U | 11 | 10 | U | 10 | 10 | U | 10 |
| Hexachlorocyclopentadiene | SVOA | 53 | U | 53 | 53 | U | 53 | 51 | U | 51 | 52 | U | 52 |
| Hexachloroethane | SVOA | 23 | U | 23 | 23 | U | 23 | 22 | U | 22 | 22 | U | 22 |
| Indeno(1,2,3-cd)pyrene | SVOA | 24 | U | 24 | 23 | U | 23 | 23 | U | 23 | 23 | U | 23 |
| Isophorone | SVOA | 18 | U | 18 | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 |
| Naphthalene | SVOA | 33 | U | 33 | 33 | U | 33 | 32 | U | 32 | 32 | U | 32 |
| Nitrobenzene | SVOA | 24 | U | 24 | 23 | U | 23 | 23 | U | 23 | 23 | U | 23 |
| N-Nitroso-di-n-dipropylamine | SVOA | 33 | U | 33 | 33 | U | 33 | 32 | U | 32 | 32 | U | 32 |
| N-Nitrosodiphenylamine | SVOA | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 |
| Pentachlorophenol | SVOA | 350 | U | 350 | 350 | U | 350 | 340 | UX | 340 | 340 | U | 340 |
| Phenanthrene | SVOA | 18 | U | 18 | 18 | U | 18 | 17 | U | 17 | 41 | J | 18 |
| Phenol | SVOA | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 |
| Pyrene | SVOA | 13 | U | 13 | 13 | U | 13 | 12 | U | 12 | 74 | J | 13 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 39 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1V271, EXC1-3 | | | J1V273, EXC1-5 | | | J1V274, EXC1-6 | | | J1V275, EXC1-7 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/15/14 | | | 12/15/14 | | | 12/15/14 | | | 12/15/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 28 | U | 28 | 28 | U | 28 | 27 | U | 27 | 27 | U | 27 |
| 1,2-Dichlorobenzene | SVOA | 22 | U | 22 | 22 | U | 22 | 21 | U | 21 | 21 | U | 21 |
| 1,3-Dichlorobenzene | SVOA | 12 | U | 12 | 12 | U | 12 | 11 | U | 11 | 12 | U | 12 |
| 1,4-Dichlorobenzene | SVOA | 13 | U | 13 | 14 | U | 14 | 13 | U | 13 | 13 | U | 13 |
| 2,4,5-Trichlorophenol | SVOA | 9.9 | U | 9.9 | 10 | U | 10 | 9.6 | U | 9.6 | 9.8 | U | 9.8 |
| 2,4,6-Trichlorophenol | SVOA | 9.9 | U | 9.9 | 10 | U | 10 | 9.6 | U | 9.6 | 9.8 | U | 9.8 |
| 2,4-Dichlorophenol | SVOA | 9.9 | U | 9.9 | 10 | U | 10 | 9.6 | U | 9.6 | 9.8 | U | 9.8 |
| 2,4-Dimethylphenol | SVOA | 65 | U | 65 | 66 | U | 66 | 63 | U | 63 | 64 | U | 64 |
| 2,4-Dinitrophenol | SVOA | 330 | U | 330 | 330 | U | 330 | 320 | U | 320 | 330 | U | 330 |
| 2,4-Dinitrotoluene | SVOA | 65 | U | 65 | 66 | U | 66 | 63 | U | 63 | 64 | U | 64 |
| 2,6-Dinitrotoluene | SVOA | 28 | U | 28 | 28 | U | 28 | 27 | U | 27 | 27 | U | 27 |
| 2-Chloronaphthalene | SVOA | 9.9 | U | 9.9 | 10 | U | 10 | 9.6 | U | 9.6 | 9.8 | U | 9.8 |
| 2-Chlorophenol | SVOA | 21 | U | 21 | 21 | U | 21 | 20 | U | 20 | 21 | U | 21 |
| 2-Methylnaphthalene | SVOA | 19 | U | 19 | 19 | U | 19 | 18 | U | 18 | 19 | U | 19 |
| 2-Methylphenol (cresol, o-) | SVOA | 13 | U | 13 | 13 | U | 13 | 12 | U | 12 | 13 | U | 13 |
| 2-Nitroaniline | SVOA | 50 | U | 50 | 50 | U | 50 | 48 | U | 48 | 49 | U | 49 |
| 2-Nitrophenol | SVOA | 9.9 | U | 9.9 | 10 | U | 10 | 9.6 | U | 9.6 | 9.8 | U | 9.8 |
| 3,3'-Dichlorobenzidine | SVOA | 89 | U | 89 | 90 | U | 90 | 86 | U | 86 | 88 | U | 88 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 33 | U | 33 | 33 | U | 33 | 32 | U | 32 | 32 | U | 32 |
| 3-Nitroaniline | SVOA | 72 | U | 72 | 73 | U | 73 | 70 | U | 70 | 71 | U | 71 |
| 4,6-Dinitro-2-methylphenol | SVOA | 330 | U | 330 | 330 | U | 330 | 320 | U | 320 | 320 | U | 320 |
| 4-Bromophenylphenyl ether | SVOA | 19 | U | 19 | 19 | U | 19 | 18 | U | 18 | 19 | U | 19 |
| 4-Chloro-3-methylphenol | SVOA | 65 | U | 65 | 66 | U | 66 | 63 | U | 63 | 64 | U | 64 |
| 4-Chloroaniline | SVOA | 81 | UJ | 81 | 82 | UJ | 82 | 78 | UJ | 78 | 80 | UJ | 80 |
| 4-Chlorophenylphenyl ether | SVOA | 21 | U | 21 | 21 | U | 21 | 20 | U | 20 | 21 | U | 21 |
| 4-Nitroaniline | SVOA | 72 | U | 72 | 73 | U | 73 | 69 | U | 69 | 71 | U | 71 |
| 4-Nitrophenol | SVOA | 96 | U | 96 | 97 | U | 97 | 93 | U | 93 | 95 | U | 95 |
| Acenaphthene | SVOA | 10 | U | 10 | 10 | U | 10 | 9.9 | U | 9.9 | 10 | U | 10 |
| Acenaphthylene | SVOA | 17 | U | 17 | 17 | U | 17 | 16 | U | 16 | 17 | U | 17 |
| Anthracene | SVOA | 17 | U | 17 | 17 | U | 17 | 16 | U | 16 | 17 | U | 17 |
| Benzo(a)anthracene | SVOA | 20 | U | 20 | 20 | U | 20 | 19 | U | 19 | 20 | U | 20 |
| Benzo(a)pyrene | SVOA | 20 | U | 20 | 20 | U | 20 | 19 | U | 19 | 20 | U | 20 |
| Benzo(b)fluoranthene | SVOA | 26 | U | 26 | 28 | J | 26 | 25 | U | 25 | 26 | U | 26 |
| Benzo(ghi)perylene | SVOA | 16 | U | 16 | 16 | J | 16 | 15 | U | 15 | 16 | U | 16 |
| Benzo(k)fluoranthene | SVOA | 40 | U | 40 | 40 | U | 40 | 38 | U | 38 | 39 | U | 39 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 23 | U | 23 | 23 | U | 23 | 22 | U | 22 | 22 | U | 22 |
| Bis(2-Chloroethoxy)methane | SVOA | 23 | U | 23 | 23 | U | 23 | 22 | U | 22 | 22 | U | 22 |
| Bis(2-chloroethyl) ether | SVOA | 16 | U | 16 | 17 | U | 17 | 16 | U | 16 | 16 | U | 16 |
| Bis(2-ethylhexyl) phthalate | SVOA | 46 | U | 46 | 46 | U | 46 | 44 | U | 44 | 45 | U | 45 |
| Butylbenzylphthalate | SVOA | 43 | U | 43 | 43 | U | 43 | 41 | U | 41 | 42 | U | 42 |
| Carbazole | SVOA | 36 | U | 36 | 36 | U | 36 | 34 | U | 34 | 35 | U | 35 |
| Chrysene | SVOA | 27 | U | 27 | 27 | U | 27 | 26 | U | 26 | 26 | U | 26 |
| Dibenz[a,h]anthracene | SVOA | 19 | U | 19 | 19 | U | 19 | 18 | U | 18 | 19 | U | 19 |
| Dibenzofuran | SVOA | 20 | U | 20 | 20 | U | 20 | 19 | U | 19 | 20 | U | 20 |
| Diethyl phthalate | SVOA | 26 | U | 26 | 26 | U | 26 | 25 | U | 25 | 25 | U | 25 |
| Dimethyl phthalate | SVOA | 23 | U | 23 | 23 | U | 23 | 22 | U | 22 | 22 | U | 22 |
| Di-n-butylphthalate | SVOA | 29 | U | 29 | 29 | U | 29 | 28 | U | 28 | 28 | U | 28 |
| Di-n-octylphthalate | SVOA | 14 | U | 14 | 14 | U | 14 | 14 | U | 14 | 14 | U | 14 |
| Fluoranthene | SVOA | 36 | U | 36 | 36 | J | 36 | 34 | U | 34 | 35 | U | 35 |
| Fluorene | SVOA | 18 | U | 18 | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 |
| Hexachlorobenzene | SVOA | 29 | U | 29 | 29 | U | 29 | 28 | U | 28 | 28 | U | 28 |
| Hexachlorobutadiene | SVOA | 9.9 | U | 9.9 | 10 | U | 10 | 9.6 | U | 9.6 | 9.8 | U | 9.8 |
| Hexachlorocyclopentadiene | SVOA | 50 | U | 50 | 50 | U | 50 | 48 | U | 48 | 49 | U | 49 |
| Hexachloroethane | SVOA | 21 | U | 21 | 21 | U | 21 | 20 | U | 20 | 21 | U | 21 |
| Indeno(1,2,3-cd)pyrene | SVOA | 22 | U | 22 | 22 | U | 22 | 21 | U | 21 | 21 | U | 21 |
| Isophorone | SVOA | 17 | U | 17 | 17 | U | 17 | 16 | U | 16 | 17 | U | 17 |
| Naphthalene | SVOA | 31 | U | 31 | 31 | U | 31 | 30 | U | 30 | 30 | U | 30 |
| Nitrobenzene | SVOA | 22 | U | 22 | 22 | U | 22 | 21 | U | 21 | 21 | U | 21 |
| N-Nitroso-di-n-dipropylamine | SVOA | 31 | U | 31 | 31 | U | 31 | 30 | U | 30 | 30 | U | 30 |
| N-Nitrosodiphenylamine | SVOA | 21 | U | 21 | 21 | U | 21 | 20 | U | 20 | 21 | U | 21 |
| Pentachlorophenol | SVOA | 330 | U | 330 | 330 | U | 330 | 320 | U | 320 | 320 | U | 320 |
| Phenanthrene | SVOA | 17 | U | 17 | 17 | U | 17 | 16 | U | 16 | 17 | U | 17 |
| Phenol | SVOA | 18 | U | 18 | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 |
| Pyrene | SVOA | 12 | U | 12 | 35 | J | 12 | 12 | U | 12 | 12 | U | 12 |

| | | | |
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| Attachment | 1 | Sheet No. | 40 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1V276, EXC1-8 | | | J1V277, EXC1-9 | | | J1V278, EXC1-10 | | | J1V279, EXC1-11 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/15/14 | | | 12/15/14 | | | 12/15/14 | | | 12/15/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 31 | U | 31 | 28 | U | 28 | 30 | U | 30 | 28 | U | 28 |
| 1,2-Dichlorobenzene | SVOA | 24 | U | 24 | 22 | U | 22 | 24 | U | 24 | 22 | U | 22 |
| 1,3-Dichlorobenzene | SVOA | 13 | U | 13 | 14 | J | 12 | 13 | U | 13 | 12 | U | 12 |
| 1,4-Dichlorobenzene | SVOA | 15 | U | 15 | 14 | J | 14 | 15 | U | 15 | 14 | U | 14 |
| 2,4,5-Trichlorophenol | SVOA | 11 | U | 11 | 16 | J | 10 | 11 | U | 11 | 10 | U | 10 |
| 2,4,6-Trichlorophenol | SVOA | 11 | U | 11 | 13 | J | 10 | 11 | U | 11 | 10 | U | 10 |
| 2,4-Dichlorophenol | SVOA | 11 | U | 11 | 10 | U | 10 | 11 | U | 11 | 10 | U | 10 |
| 2,4-Dimethylphenol | SVOA | 72 | U | 72 | 67 | U | 67 | 71 | U | 71 | 66 | U | 66 |
| 2,4-Dinitrophenol | SVOA | 370 | U | 370 | 340 | U | 340 | 360 | U | 360 | 340 | U | 340 |
| 2,4-Dinitrotoluene | SVOA | 72 | U | 72 | 67 | U | 67 | 71 | U | 71 | 66 | U | 66 |
| 2,6-Dinitrotoluene | SVOA | 31 | U | 31 | 28 | U | 28 | 30 | U | 30 | 28 | U | 28 |
| 2-Chloronaphthalene | SVOA | 11 | U | 11 | 18 | J | 10 | 11 | U | 11 | 10 | U | 10 |
| 2-Chlorophenol | SVOA | 23 | U | 23 | 21 | U | 21 | 23 | U | 23 | 21 | U | 21 |
| 2-Methylnaphthalene | SVOA | 21 | U | 21 | 19 | U | 19 | 20 | U | 20 | 19 | U | 19 |
| 2-Methylphenol (cresol, o-) | SVOA | 14 | U | 14 | 13 | U | 13 | 14 | U | 14 | 13 | U | 13 |
| 2-Nitroaniline | SVOA | 55 | U | 55 | 50 | U | 50 | 54 | U | 54 | 50 | U | 50 |
| 2-Nitrophenol | SVOA | 11 | U | 11 | 14 | J | 10 | 11 | U | 11 | 10 | U | 10 |
| 3,3'-Dichlorobenzidine | SVOA | 99 | U | 99 | 91 | U | 91 | 97 | U | 97 | 91 | U | 91 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 36 | U | 36 | 33 | U | 33 | 36 | U | 36 | 33 | U | 33 |
| 3-Nitroaniline | SVOA | 80 | U | 80 | 74 | U | 74 | 79 | U | 79 | 73 | U | 73 |
| 4,6-Dinitro-2-methylphenol | SVOA | 360 | U | 360 | 330 | U | 330 | 360 | U | 360 | 330 | U | 330 |
| 4-Bromophenylphenyl ether | SVOA | 21 | U | 21 | 19 | U | 19 | 20 | U | 20 | 19 | U | 19 |
| 4-Chloro-3-methylphenol | SVOA | 72 | U | 72 | 67 | U | 67 | 71 | U | 71 | 66 | U | 66 |
| 4-Chloroaniline | SVOA | 90 | UJ | 90 | 83 | UJ | 83 | 88 | UJ | 88 | 82 | UJ | 82 |
| 4-Chlorophenylphenyl ether | SVOA | 23 | U | 23 | 21 | U | 21 | 23 | U | 23 | 21 | U | 21 |
| 4-Nitroaniline | SVOA | 80 | U | 80 | 73 | U | 73 | 78 | U | 78 | 73 | U | 73 |
| 4-Nitrophenol | SVOA | 110 | U | 110 | 98 | U | 98 | 100 | U | 100 | 98 | U | 98 |
| Acenaphthene | SVOA | 11 | U | 11 | 18 | J | 10 | 11 | U | 11 | 10 | U | 10 |
| Acenaphthylene | SVOA | 19 | U | 19 | 17 | U | 17 | 18 | U | 18 | 17 | U | 17 |
| Anthracene | SVOA | 19 | U | 19 | 17 | U | 17 | 18 | U | 18 | 17 | U | 17 |
| Benzo(a)anthracene | SVOA | 22 | U | 22 | 20 | J | 20 | 22 | U | 22 | 20 | U | 20 |
| Benzo(a)pyrene | SVOA | 22 | U | 22 | 20 | U | 20 | 22 | U | 22 | 20 | U | 20 |
| Benzo(b)fluoranthene | SVOA | 29 | U | 29 | 26 | U | 26 | 28 | U | 28 | 26 | U | 26 |
| Benzo(ghi)perylene | SVOA | 18 | U | 18 | 16 | U | 16 | 17 | U | 17 | 16 | U | 16 |
| Benzo(k)fluoranthene | SVOA | 44 | U | 44 | 40 | U | 40 | 43 | U | 43 | 40 | U | 40 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 25 | U | 25 | 23 | U | 23 | 25 | U | 25 | 23 | U | 23 |
| Bis(2-Chloroethoxy)methane | SVOA | 25 | U | 25 | 23 | U | 23 | 25 | U | 25 | 23 | U | 23 |
| Bis(2-chloroethyl) ether | SVOA | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 | 17 | U | 17 |
| Bis(2-ethylhexyl) phthalate | SVOA | 50 | U | 50 | 46 | U | 46 | 50 | U | 50 | 46 | U | 46 |
| Butylbenzylphthalate | SVOA | 47 | U | 47 | 43 | U | 43 | 46 | U | 46 | 43 | U | 43 |
| Carbazole | SVOA | 39 | U | 39 | 36 | U | 36 | 39 | U | 39 | 36 | U | 36 |
| Chrysene | SVOA | 30 | U | 30 | 27 | U | 27 | 29 | U | 29 | 27 | U | 27 |
| Dibenz[a,h]anthracene | SVOA | 21 | U | 21 | 19 | U | 19 | 20 | U | 20 | 19 | U | 19 |
| Dibenzofuran | SVOA | 22 | U | 22 | 20 | U | 20 | 22 | U | 22 | 20 | U | 20 |
| Diethyl phthalate | SVOA | 29 | U | 29 | 26 | U | 26 | 28 | U | 28 | 26 | U | 26 |
| Dimethyl phthalate | SVOA | 25 | U | 25 | 23 | U | 23 | 25 | U | 25 | 23 | U | 23 |
| Di-n-butylphthalate | SVOA | 32 | U | 32 | 29 | U | 29 | 31 | U | 31 | 29 | U | 29 |
| Di-n-octylphthalate | SVOA | 16 | U | 16 | 15 | U | 15 | 16 | U | 16 | 14 | U | 14 |
| Fluoranthene | SVOA | 39 | U | 39 | 36 | U | 36 | 39 | U | 39 | 36 | U | 36 |
| Fluorene | SVOA | 20 | U | 20 | 19 | J | 18 | 19 | U | 19 | 18 | U | 18 |
| Hexachlorobenzene | SVOA | 32 | U | 32 | 29 | U | 29 | 31 | U | 31 | 29 | U | 29 |
| Hexachlorobutadiene | SVOA | 11 | U | 11 | 10 | U | 10 | 11 | U | 11 | 10 | U | 10 |
| Hexachlorocyclopentadiene | SVOA | 55 | U | 55 | 50 | U | 50 | 54 | U | 54 | 50 | U | 50 |
| Hexachloroethane | SVOA | 23 | U | 23 | 21 | U | 21 | 23 | U | 23 | 21 | U | 21 |
| Indeno(1,2,3-cd)pyrene | SVOA | 24 | U | 24 | 22 | U | 22 | 24 | U | 24 | 22 | U | 22 |
| Isophorone | SVOA | 19 | U | 19 | 17 | U | 17 | 18 | U | 18 | 17 | U | 17 |
| Naphthalene | SVOA | 34 | U | 34 | 31 | U | 31 | 33 | U | 33 | 31 | U | 31 |
| Nitrobenzene | SVOA | 24 | U | 24 | 22 | U | 22 | 24 | U | 24 | 22 | U | 22 |
| N-Nitroso-di-n-dipropylamine | SVOA | 34 | U | 34 | 31 | U | 31 | 33 | U | 33 | 31 | U | 31 |
| N-Nitrosodiphenylamine | SVOA | 23 | U | 23 | 21 | U | 21 | 23 | U | 23 | 21 | U | 21 |
| Pentachlorophenol | SVOA | 360 | U | 360 | 330 | U | 330 | 360 | U | 360 | 330 | U | 330 |
| Phenanthrene | SVOA | 29 | J | 19 | 20 | J | 17 | 18 | U | 18 | 17 | U | 17 |
| Phenol | SVOA | 20 | U | 20 | 18 | U | 18 | 19 | U | 19 | 18 | U | 18 |
| Pyrene | SVOA | 25 | J | 13 | 17 | J | 12 | 13 | J | 13 | 12 | U | 12 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 41 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1V280, EXC1-12 | | | J1V292, EXC2-7 | | | J1V298, Duplicate of J1V292 | | | J1V286, EXC2-1 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/15/14 | | | 12/12/14 | | | 12/12/14 | | | 12/12/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 29 | U | 29 | 27 | U | 27 | 29 | U | 29 | 28 | U | 28 |
| 1,2-Dichlorobenzene | SVOA | 23 | U | 23 | 22 | U | 22 | 23 | U | 23 | 22 | U | 22 |
| 1,3-Dichlorobenzene | SVOA | 12 | U | 12 | 12 | U | 12 | 13 | U | 13 | 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 | 9.8 | U | 9.8 | 10 | U | 10 | 10 | U | 10 |
| 2,4,6-Trichlorophenol | SVOA | 10 | U | 10 | 9.8 | U | 9.8 | 10 | U | 10 | 10 | U | 10 |
| 2,4-Dichlorophenol | SVOA | 10 | U | 10 | 9.8 | U | 9.8 | 10 | U | 10 | 10 | U | 10 |
| 2,4-Dimethylphenol | SVOA | 68 | U | 68 | 65 | U | 65 | 69 | U | 69 | 67 | U | 67 |
| 2,4-Dinitrophenol | SVOA | 340 | U | 340 | 330 | U | 330 | 350 | U | 350 | 340 | U | 340 |
| 2,4-Dinitrotoluene | SVOA | 68 | U | 68 | 65 | U | 65 | 69 | U | 69 | 67 | U | 67 |
| 2,6-Dinitrotoluene | SVOA | 29 | U | 29 | 27 | U | 27 | 29 | U | 29 | 28 | U | 28 |
| 2-Chloronaphthalene | SVOA | 10 | U | 10 | 9.8 | U | 9.8 | 10 | U | 10 | 10 | U | 10 |
| 2-Chlorophenol | SVOA | 22 | U | 22 | 21 | U | 21 | 22 | U | 22 | 21 | U | 21 |
| 2-Methylnaphthalene | SVOA | 20 | U | 20 | 19 | U | 19 | 20 | U | 20 | 19 | U | 19 |
| 2-Methylphenol (cresol, o-) | SVOA | 13 | U | 13 | 13 | U | 13 | 14 | U | 14 | 13 | U | 13 |
| 2-Nitroaniline | SVOA | 52 | U | 52 | 49 | U | 49 | 52 | U | 52 | 50 | U | 50 |
| 2-Nitrophenol | SVOA | 10 | U | 10 | 9.8 | U | 9.8 | 10 | U | 10 | 10 | U | 10 |
| 3,3'-Dichlorobenzidine | SVOA | 93 | U | 93 | 88 | U | 88 | 94 | U | 94 | 91 | U | 91 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 34 | U | 34 | 32 | U | 32 | 34 | U | 34 | 33 | U | 33 |
| 3-Nitroaniline | SVOA | 76 | U | 76 | 71 | U | 71 | 76 | U | 76 | 74 | U | 74 |
| 4,6-Dinitro-2-methylphenol | SVOA | 340 | U | 340 | 320 | U | 320 | 340 | U | 340 | 330 | U | 330 |
| 4-Bromophenylphenyl ether | SVOA | 20 | U | 20 | 19 | U | 19 | 20 | U | 20 | 19 | U | 19 |
| 4-Chloro-3-methylphenol | SVOA | 68 | U | 68 | 65 | U | 65 | 69 | U | 69 | 67 | U | 67 |
| 4-Chloroaniline | SVOA | 85 | UJ | 85 | 80 | U | 80 | 85 | U | 85 | 83 | U | 83 |
| 4-Chlorophenylphenyl ether | SVOA | 22 | U | 22 | 21 | U | 21 | 22 | U | 22 | 21 | U | 21 |
| 4-Nitroaniline | SVOA | 75 | U | 75 | 71 | U | 71 | 76 | U | 76 | 73 | U | 73 |
| 4-Nitrophenol | SVOA | 100 | U | 100 | 95 | U | 95 | 100 | U | 100 | 98 | U | 98 |
| Acenaphthene | SVOA | 11 | U | 11 | 10 | U | 10 | 11 | U | 11 | 10 | U | 10 |
| Acenaphthylene | SVOA | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 | 17 | U | 17 |
| Anthracene | SVOA | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 | 17 | U | 17 |
| Benzo(a)anthracene | SVOA | 21 | U | 21 | 20 | U | 20 | 21 | U | 21 | 20 | U | 20 |
| Benzo(a)pyrene | SVOA | 21 | U | 21 | 20 | U | 20 | 21 | U | 21 | 20 | U | 20 |
| Benzo(b)fluoranthene | SVOA | 27 | U | 27 | 26 | U | 26 | 27 | U | 27 | 26 | U | 26 |
| Benzo(ghi)perylene | SVOA | 17 | U | 17 | 16 | U | 16 | 17 | U | 17 | 16 | U | 16 |
| Benzo(k)fluoranthene | SVOA | 41 | U | 41 | 39 | U | 39 | 42 | U | 42 | 40 | U | 40 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 24 | U | 24 | 22 | U | 22 | 24 | U | 24 | 23 | U | 23 |
| Bis(2-Chloroethoxy)methane | SVOA | 24 | U | 24 | 22 | U | 22 | 24 | U | 24 | 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 | 48 | U | 48 | 45 | U | 45 | 48 | U | 48 | 46 | U | 46 |
| Butylbenzylphthalate | SVOA | 44 | U | 44 | 42 | U | 42 | 45 | U | 45 | 43 | U | 43 |
| Carbazole | SVOA | 37 | U | 37 | 35 | U | 35 | 38 | U | 38 | 36 | U | 36 |
| Chrysene | SVOA | 28 | U | 28 | 26 | U | 26 | 28 | U | 28 | 27 | U | 27 |
| Dibenz[a,h]anthracene | SVOA | 20 | U | 20 | 19 | U | 19 | 20 | U | 20 | 19 | U | 19 |
| Dibenzofuran | SVOA | 21 | U | 21 | 20 | U | 20 | 21 | U | 21 | 20 | U | 20 |
| Diethyl phthalate | SVOA | 27 | U | 27 | 25 | U | 25 | 27 | U | 27 | 26 | U | 26 |
| Dimethyl phthalate | SVOA | 24 | U | 24 | 22 | U | 22 | 24 | U | 24 | 23 | U | 23 |
| Di-n-butylphthalate | SVOA | 30 | U | 30 | 28 | U | 28 | 30 | U | 30 | 29 | U | 29 |
| Di-n-octylphthalate | SVOA | 15 | U | 15 | 14 | U | 14 | 15 | U | 15 | 15 | U | 15 |
| Fluoranthene | SVOA | 37 | U | 37 | 35 | U | 35 | 38 | U | 38 | 36 | U | 36 |
| Fluorene | SVOA | 19 | U | 19 | 18 | U | 18 | 19 | U | 19 | 18 | U | 18 |
| Hexachlorobenzene | SVOA | 30 | U | 30 | 28 | U | 28 | 30 | U | 30 | 29 | U | 29 |
| Hexachlorobutadiene | SVOA | 10 | U | 10 | 9.8 | U | 9.8 | 10 | U | 10 | 10 | U | 10 |
| Hexachlorocyclopentadiene | SVOA | 52 | U | 52 | 49 | U | 49 | 52 | U | 52 | 50 | U | 50 |
| Hexachloroethane | SVOA | 22 | U | 22 | 21 | U | 21 | 22 | U | 22 | 22 | U | 22 |
| Indeno(1,2,3-cd)pyrene | SVOA | 23 | U | 23 | 22 | U | 22 | 23 | U | 23 | 22 | U | 22 |
| Isophorone | SVOA | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 | 17 | U | 17 |
| Naphthalene | SVOA | 32 | U | 32 | 30 | U | 30 | 32 | U | 32 | 31 | U | 31 |
| Nitrobenzene | SVOA | 23 | U | 23 | 22 | U | 22 | 23 | U | 23 | 22 | U | 22 |
| N-Nitroso-di-n-dipropylamine | SVOA | 32 | U | 32 | 30 | U | 30 | 32 | U | 32 | 31 | U | 31 |
| N-Nitrosodiphenylamine | SVOA | 22 | U | 22 | 21 | U | 21 | 22 | U | 22 | 21 | U | 21 |
| Pentachlorophenol | SVOA | 340 | U | 340 | 320 | U | 320 | 340 | U | 340 | 330 | U | 330 |
| Phenanthrene | SVOA | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 | 17 | U | 17 |
| Phenol | SVOA | 19 | U | 19 | 18 | U | 18 | 19 | U | 19 | 18 | U | 18 |
| Pyrene | SVOA | 13 | U | 13 | 18 | J | 12 | 13 | U | 13 | 12 | U | 12 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 42 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1V287, EXC2-2 | | | J1V288, EXC2-3 | | | J1V289, EXC2-4 | | | J1V290, EXC2-5 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/12/14 | | | 12/12/14 | | | 12/12/14 | | | 12/12/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 28 | U | 28 | 29 | U | 29 | 27 | U | 27 | 28 | U | 28 |
| 1,2-Dichlorobenzene | SVOA | 22 | U | 22 | 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 |
| 1,4-Dichlorobenzene | SVOA | 14 | U | 14 | 14 | U | 14 | 13 | U | 13 | 13 | U | 13 |
| 2,4,5-Trichlorophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 9.8 | U | 9.8 | 9.9 | U | 9.9 |
| 2,4,6-Trichlorophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 9.8 | U | 9.8 | 9.9 | U | 9.9 |
| 2,4-Dichlorophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 9.8 | U | 9.8 | 9.9 | U | 9.9 |
| 2,4-Dimethylphenol | SVOA | 67 | U | 67 | 67 | U | 67 | 65 | U | 65 | 65 | U | 65 |
| 2,4-Dinitrophenol | SVOA | 340 | U | 340 | 340 | U | 340 | 330 | U | 330 | 330 | U | 330 |
| 2,4-Dinitrotoluene | SVOA | 67 | U | 67 | 67 | U | 67 | 65 | U | 65 | 65 | U | 65 |
| 2,6-Dinitrotoluene | SVOA | 28 | U | 28 | 29 | U | 29 | 27 | U | 27 | 28 | U | 28 |
| 2-Chloronaphthalene | SVOA | 10 | U | 10 | 10 | U | 10 | 9.8 | U | 9.8 | 9.9 | U | 9.9 |
| 2-Chlorophenol | SVOA | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 |
| 2-Methylnaphthalene | SVOA | 19 | U | 19 | 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 |
| 2-Nitroaniline | SVOA | 51 | U | 51 | 51 | U | 51 | 49 | U | 49 | 50 | U | 50 |
| 2-Nitrophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 9.8 | U | 9.8 | 9.9 | U | 9.9 |
| 3,3'-Dichlorobenzidine | SVOA | 91 | U | 91 | 92 | U | 92 | 88 | U | 88 | 89 | U | 89 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 33 | U | 33 | 34 | U | 34 | 32 | U | 32 | 33 | U | 33 |
| 3-Nitroaniline | SVOA | 74 | U | 74 | 75 | U | 75 | 72 | U | 72 | 72 | U | 72 |
| 4,6-Dinitro-2-methylphenol | SVOA | 330 | U | 330 | 340 | U | 340 | 320 | U | 320 | 330 | U | 330 |
| 4-Bromophenylphenyl ether | SVOA | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 |
| 4-Chloro-3-methylphenol | SVOA | 67 | U | 67 | 67 | U | 67 | 65 | U | 65 | 65 | U | 65 |
| 4-Chloroaniline | SVOA | 83 | U | 83 | 84 | U | 84 | 80 | U | 80 | 81 | U | 81 |
| 4-Chlorophenylphenyl ether | SVOA | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 |
| 4-Nitroaniline | SVOA | 73 | U | 73 | 74 | U | 74 | 71 | U | 71 | 72 | U | 72 |
| 4-Nitrophenol | SVOA | 98 | U | 98 | 99 | U | 99 | 95 | U | 95 | 96 | U | 96 |
| Acenaphthene | SVOA | 10 | U | 10 | 11 | U | 11 | 10 | U | 10 | 10 | U | 10 |
| Acenaphthylene | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 |
| Anthracene | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 |
| Benzo(a)anthracene | SVOA | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 |
| Benzo(a)pyrene | SVOA | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 |
| Benzo(b)fluoranthene | SVOA | 27 | U | 27 | 38 | J | 27 | 26 | U | 26 | 26 | U | 26 |
| Benzo(ghi)perylene | SVOA | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 |
| Benzo(k)fluoranthene | SVOA | 40 | U | 40 | 41 | U | 41 | 39 | U | 39 | 40 | U | 40 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 23 | U | 23 | 24 | U | 24 | 23 | U | 23 | 23 | U | 23 |
| Bis(2-Chloroethoxy)methane | SVOA | 23 | U | 23 | 24 | U | 24 | 23 | U | 23 | 23 | U | 23 |
| Bis(2-chloroethyl) ether | SVOA | 17 | U | 17 | 17 | U | 17 | 16 | U | 16 | 16 | U | 16 |
| Bis(2-ethylhexyl) phthalate | SVOA | 47 | U | 47 | 47 | U | 47 | 45 | U | 45 | 46 | U | 46 |
| Butylbenzylphthalate | SVOA | 43 | U | 43 | 44 | U | 44 | 42 | U | 42 | 43 | U | 43 |
| Carbazole | SVOA | 36 | U | 36 | 37 | U | 37 | 35 | U | 35 | 36 | U | 36 |
| Chrysene | SVOA | 27 | U | 27 | 28 | U | 28 | 26 | U | 26 | 27 | U | 27 |
| Dibenz[a,h]anthracene | SVOA | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 |
| Dibenzofuran | SVOA | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 |
| Diethyl phthalate | SVOA | 26 | U | 26 | 27 | U | 27 | 26 | U | 26 | 26 | U | 26 |
| Dimethyl phthalate | SVOA | 23 | U | 23 | 24 | U | 24 | 23 | U | 23 | 23 | U | 23 |
| Di-n-butylphthalate | SVOA | 29 | U | 29 | 30 | U | 30 | 28 | U | 28 | 29 | U | 29 |
| Di-n-octylphthalate | SVOA | 15 | U | 15 | 15 | U | 15 | 14 | U | 14 | 14 | U | 14 |
| Fluoranthene | SVOA | 36 | U | 36 | 37 | U | 37 | 35 | U | 35 | 36 | U | 36 |
| Fluorene | SVOA | 18 | U | 18 | 18 | U | 18 | 18 | U | 18 | 18 | U | 18 |
| Hexachlorobenzene | SVOA | 29 | U | 29 | 30 | U | 30 | 28 | U | 28 | 29 | U | 29 |
| Hexachlorobutadiene | SVOA | 10 | U | 10 | 10 | U | 10 | 9.8 | U | 9.8 | 9.9 | U | 9.9 |
| Hexachlorocyclopentadiene | SVOA | 51 | U | 51 | 51 | U | 51 | 49 | U | 49 | 50 | U | 50 |
| Hexachloroethane | SVOA | 22 | U | 22 | 22 | U | 22 | 21 | U | 21 | 21 | U | 21 |
| Indeno(1,2,3-cd)pyrene | SVOA | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 |
| Isophorone | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 |
| Naphthalene | SVOA | 31 | U | 31 | 32 | U | 32 | 30 | U | 30 | 31 | U | 31 |
| Nitrobenzene | SVOA | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 |
| N-Nitroso-di-n-dipropylamine | SVOA | 31 | U | 31 | 32 | U | 32 | 30 | U | 30 | 31 | U | 31 |
| N-Nitrosodiphenylamine | SVOA | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 |
| Pentachlorophenol | SVOA | 330 | U | 330 | 340 | U | 340 | 320 | U | 320 | 330 | U | 330 |
| Phenanthrene | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 |
| Phenol | SVOA | 18 | U | 18 | 18 | U | 18 | 18 | U | 18 | 18 | U | 18 |
| Pyrene | SVOA | 12 | U | 12 | 33 | J | 12 | 12 | U | 12 | 12 | U | 12 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 43 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1V291, EXC2-6 | | | J1V293, EXC2-8 | | | J1V294, EXC2-9 | | | J1V295, EXC2-10 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/12/14 | | | 12/12/14 | | | 12/12/14 | | | 12/12/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 29 | U | 29 | 28 | U | 28 | 29 | U | 29 | 28 | U | 28 |
| 1,2-Dichlorobenzene | SVOA | 23 | U | 23 | 22 | U | 22 | 23 | U | 23 | 22 | U | 22 |
| 1,3-Dichlorobenzene | SVOA | 13 | U | 13 | 12 | U | 12 | 13 | U | 13 | 12 | U | 12 |
| 1,4-Dichlorobenzene | SVOA | 14 | U | 14 | 14 | U | 14 | 14 | U | 14 | 14 | U | 14 |
| 2,4,5-Trichlorophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| 2,4,6-Trichlorophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| 2,4-Dichlorophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| 2,4-Dimethylphenol | SVOA | 69 | U | 69 | 67 | U | 67 | 69 | U | 69 | 67 | U | 67 |
| 2,4-Dinitrophenol | SVOA | 350 | U | 350 | 340 | U | 340 | 350 | U | 350 | 340 | U | 340 |
| 2,4-Dinitrotoluene | SVOA | 69 | U | 69 | 67 | U | 67 | 69 | U | 69 | 67 | U | 67 |
| 2,6-Dinitrotoluene | SVOA | 29 | U | 29 | 28 | U | 28 | 29 | U | 29 | 28 | U | 28 |
| 2-Chloronaphthalene | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| 2-Chlorophenol | SVOA | 22 | U | 22 | 21 | U | 21 | 22 | U | 22 | 21 | U | 21 |
| 2-Methylnaphthalene | SVOA | 20 | U | 20 | 19 | U | 19 | 20 | U | 20 | 19 | U | 19 |
| 2-Methylphenol (cresol, o-) | SVOA | 14 | U | 14 | 13 | U | 13 | 14 | U | 14 | 13 | U | 13 |
| 2-Nitroaniline | SVOA | 52 | U | 52 | 51 | U | 51 | 52 | U | 52 | 50 | U | 50 |
| 2-Nitrophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| 3,3'-Dichlorobenzidine | SVOA | 94 | U | 94 | 91 | U | 91 | 94 | U | 94 | 91 | U | 91 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 34 | U | 34 | 33 | U | 33 | 35 | U | 35 | 33 | U | 33 |
| 3-Nitroaniline | SVOA | 76 | U | 76 | 74 | U | 74 | 76 | U | 76 | 74 | U | 74 |
| 4,6-Dinitro-2-methylphenol | SVOA | 340 | U | 340 | 330 | U | 330 | 350 | U | 350 | 330 | U | 330 |
| 4-Bromophenylphenyl ether | SVOA | 20 | U | 20 | 19 | U | 19 | 20 | U | 20 | 19 | U | 19 |
| 4-Chloro-3-methylphenol | SVOA | 69 | U | 69 | 67 | U | 67 | 69 | U | 69 | 67 | U | 67 |
| 4-Chloroaniline | SVOA | 86 | U | 86 | 83 | U | 83 | 86 | U | 86 | 83 | U | 83 |
| 4-Chlorophenylphenyl ether | SVOA | 22 | U | 22 | 21 | U | 21 | 22 | U | 22 | 21 | U | 21 |
| 4-Nitroaniline | SVOA | 76 | U | 76 | 73 | U | 73 | 76 | U | 76 | 73 | U | 73 |
| 4-Nitrophenol | SVOA | 100 | U | 100 | 98 | U | 98 | 100 | U | 100 | 98 | U | 98 |
| Acenaphthene | SVOA | 11 | U | 11 | 10 | U | 10 | 11 | U | 11 | 10 | U | 10 |
| Acenaphthylene | SVOA | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 | 17 | U | 17 |
| Anthracene | SVOA | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 | 17 | U | 17 |
| Benzo(a)anthracene | SVOA | 21 | U | 21 | 20 | U | 20 | 21 | U | 21 | 20 | U | 20 |
| Benzo(a)pyrene | SVOA | 21 | U | 21 | 20 | U | 20 | 21 | U | 21 | 20 | U | 20 |
| Benzo(b)fluoranthene | SVOA | 27 | U | 27 | 26 | U | 26 | 27 | U | 27 | 26 | U | 26 |
| Benzo(ghi)perylene | SVOA | 17 | U | 17 | 16 | U | 16 | 17 | U | 17 | 16 | U | 16 |
| Benzo(k)fluoranthene | SVOA | 42 | U | 42 | 40 | U | 40 | 42 | U | 42 | 40 | U | 40 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 24 | U | 24 | 23 | U | 23 | 24 | U | 24 | 23 | U | 23 |
| Bis(2-Chloroethoxy)methane | SVOA | 24 | U | 24 | 23 | U | 23 | 24 | U | 24 | 23 | U | 23 |
| Bis(2-chloroethyl) ether | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 |
| Bis(2-ethylhexyl) phthalate | SVOA | 48 | U | 48 | 47 | U | 47 | 48 | U | 48 | 46 | U | 46 |
| Butylbenzylphthalate | SVOA | 45 | U | 45 | 43 | U | 43 | 45 | U | 45 | 43 | U | 43 |
| Carbazole | SVOA | 38 | U | 38 | 36 | U | 36 | 38 | U | 38 | 36 | U | 36 |
| Chrysene | SVOA | 28 | U | 28 | 27 | U | 27 | 28 | U | 28 | 27 | U | 27 |
| Dibenz[a,h]anthracene | SVOA | 20 | U | 20 | 19 | U | 19 | 20 | U | 20 | 19 | U | 19 |
| Dibenzofuran | SVOA | 21 | U | 21 | 20 | U | 20 | 21 | U | 21 | 20 | U | 20 |
| Diethyl phthalate | SVOA | 27 | U | 27 | 26 | U | 26 | 27 | U | 27 | 26 | U | 26 |
| Dimethyl phthalate | SVOA | 24 | U | 24 | 23 | U | 23 | 24 | U | 24 | 23 | U | 23 |
| Di-n-butylphthalate | SVOA | 30 | U | 30 | 29 | U | 29 | 30 | U | 30 | 29 | U | 29 |
| Di-n-octylphthalate | SVOA | 15 | U | 15 | 15 | U | 15 | 15 | U | 15 | 15 | U | 15 |
| Fluoranthene | SVOA | 38 | U | 38 | 36 | U | 36 | 38 | U | 38 | 36 | U | 36 |
| Fluorene | SVOA | 19 | U | 19 | 18 | U | 18 | 19 | U | 19 | 18 | U | 18 |
| Hexachlorobenzene | SVOA | 30 | U | 30 | 29 | U | 29 | 30 | U | 30 | 29 | U | 29 |
| Hexachlorobutadiene | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| Hexachlorocyclopentadiene | SVOA | 52 | U | 52 | 51 | U | 51 | 52 | U | 52 | 50 | U | 50 |
| Hexachloroethane | SVOA | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 | 21 | U | 21 |
| Indeno(1,2,3-cd)pyrene | SVOA | 23 | U | 23 | 22 | U | 22 | 23 | U | 23 | 22 | U | 22 |
| Isophorone | SVOA | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 | 17 | U | 17 |
| Naphthalene | SVOA | 32 | U | 32 | 31 | U | 31 | 32 | U | 32 | 31 | U | 31 |
| Nitrobenzene | SVOA | 23 | U | 23 | 22 | U | 22 | 23 | U | 23 | 22 | U | 22 |
| N-Nitroso-di-n-dipropylamine | SVOA | 32 | U | 32 | 31 | U | 31 | 32 | U | 32 | 31 | U | 31 |
| N-Nitrosodiphenylamine | SVOA | 22 | U | 22 | 21 | U | 21 | 22 | U | 22 | 21 | U | 21 |
| Pentachlorophenol | SVOA | 340 | U | 340 | 330 | U | 330 | 350 | U | 350 | 330 | U | 330 |
| Phenanthrene | SVOA | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 | 17 | U | 17 |
| Phenol | SVOA | 19 | U | 19 | 18 | U | 18 | 19 | U | 19 | 18 | U | 18 |
| Pyrene | SVOA | 13 | U | 13 | 12 | U | 12 | 13 | U | 13 | 12 | U | 12 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 44 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1V296, EXC2-11 | | | J1V297, EXC2-12 | | | J1V269, EXC1-1 | | | J1V268, Equipment blank 1 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/12/14 | | | 12/12/14 | | | 12/15/14 | | | 12/10/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 28 | U | 28 | 29 | U | 29 | 30 | U | 30 | 27 | U | 27 |
| 1,2-Dichlorobenzene | SVOA | 22 | U | 22 | 23 | U | 23 | 23 | U | 23 | 21 | U | 21 |
| 1,3-Dichlorobenzene | SVOA | 12 | U | 12 | 12 | U | 12 | 14 | J | 13 | 12 | U | 12 |
| 1,4-Dichlorobenzene | SVOA | 13 | U | 13 | 14 | U | 14 | 14 | U | 14 | 13 | U | 13 |
| 2,4,5-Trichlorophenol | SVOA | 9.9 | U | 9.9 | 10 | U | 10 | 11 | U | 11 | 9.6 | U | 9.6 |
| 2,4,6-Trichlorophenol | SVOA | 9.9 | U | 9.9 | 10 | U | 10 | 11 | U | 11 | 9.6 | U | 9.6 |
| 2,4-Dichlorophenol | SVOA | 9.9 | U | 9.9 | 10 | U | 10 | 11 | U | 11 | 9.6 | U | 9.6 |
| 2,4-Dimethylphenol | SVOA | 65 | U | 65 | 68 | U | 68 | 70 | U | 70 | 63 | U | 63 |
| 2,4-Dinitrophenol | SVOA | 330 | U | 330 | 340 | U | 340 | 350 | U | 350 | 320 | U | 320 |
| 2,4-Dinitrotoluene | SVOA | 65 | U | 65 | 68 | U | 68 | 70 | U | 70 | 63 | U | 63 |
| 2,6-Dinitrotoluene | SVOA | 28 | U | 28 | 29 | U | 29 | 30 | U | 30 | 27 | U | 27 |
| 2-Chloronaphthalene | SVOA | 9.9 | U | 9.9 | 10 | U | 10 | 14 | J | 11 | 9.6 | U | 9.6 |
| 2-Chlorophenol | SVOA | 21 | U | 21 | 22 | U | 22 | 22 | U | 22 | 20 | U | 20 |
| 2-Methylnaphthalene | SVOA | 19 | U | 19 | 20 | U | 20 | 20 | U | 20 | 18 | U | 18 |
| 2-Methylphenol (cresol, o-) | SVOA | 13 | U | 13 | 13 | U | 13 | 14 | U | 14 | 12 | U | 12 |
| 2-Nitroaniline | SVOA | 49 | U | 49 | 52 | U | 52 | 53 | U | 53 | 48 | U | 48 |
| 2-Nitrophenol | SVOA | 9.9 | U | 9.9 | 10 | U | 10 | 11 | U | 11 | 9.6 | U | 9.6 |
| 3,3'-Dichlorobenzidine | SVOA | 89 | U | 89 | 93 | U | 93 | 95 | U | 95 | 86 | U | 86 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 33 | U | 33 | 34 | U | 34 | 35 | U | 35 | 32 | U | 32 |
| 3-Nitroaniline | SVOA | 72 | U | 72 | 75 | U | 75 | 77 | U | 77 | 70 | U | 70 |
| 4,6-Dinitro-2-methylphenol | SVOA | 330 | U | 330 | 340 | U | 340 | 350 | U | 350 | 320 | U | 320 |
| 4-Bromophenylphenyl ether | SVOA | 19 | U | 19 | 20 | U | 20 | 20 | U | 20 | 18 | U | 18 |
| 4-Chloro-3-methylphenol | SVOA | 65 | U | 65 | 68 | U | 68 | 70 | U | 70 | 63 | U | 63 |
| 4-Chloroaniline | SVOA | 81 | U | 81 | 85 | U | 85 | 87 | U | 87 | 78 | U | 78 |
| 4-Chlorophenylphenyl ether | SVOA | 21 | U | 21 | 22 | U | 22 | 22 | U | 22 | 20 | U | 20 |
| 4-Nitroaniline | SVOA | 72 | U | 72 | 75 | U | 75 | 77 | U | 77 | 69 | U | 69 |
| 4-Nitrophenol | SVOA | 96 | U | 96 | 100 | U | 100 | 100 | U | 100 | 93 | U | 93 |
| Acenaphthene | SVOA | 10 | U | 10 | 11 | U | 11 | 19 | J | 11 | 9.9 | U | 9.9 |
| Acenaphthylene | SVOA | 17 | U | 17 | 18 | U | 18 | 18 | U | 18 | 16 | U | 16 |
| Anthracene | SVOA | 17 | U | 17 | 18 | U | 18 | 31 | J | 18 | 16 | U | 16 |
| Benzo(a)anthracene | SVOA | 20 | U | 20 | 42 | J | 21 | 110 | J | 21 | 23 | J | 19 |
| Benzo(a)pyrene | SVOA | 20 | U | 20 | 41 | J | 21 | 100 | J | 21 | 19 | U | 19 |
| Benzo(b)fluoranthene | SVOA | 26 | U | 26 | 53 | J | 27 | 170 | JX | 28 | 25 | U | 25 |
| Benzo(ghi)perylene | SVOA | 16 | U | 16 | 29 | J | 17 | 71 | J | 17 | 15 | U | 15 |
| Benzo(k)fluoranthene | SVOA | 40 | U | 40 | 41 | U | 41 | 42 | UX | 42 | 38 | U | 38 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 23 | U | 23 | 24 | U | 24 | 24 | U | 24 | 22 | U | 22 |
| Bis(2-Chloroethoxy)methane | SVOA | 23 | U | 23 | 24 | U | 24 | 24 | U | 24 | 22 | U | 22 |
| Bis(2-chloroethyl) ether | SVOA | 16 | U | 16 | 17 | U | 17 | 18 | U | 18 | 16 | U | 16 |
| Bis(2-ethylhexyl) phthalate | SVOA | 46 | U | 46 | 48 | U | 48 | 49 | U | 49 | 44 | U | 44 |
| Butylbenzylphthalate | SVOA | 43 | U | 43 | 44 | U | 44 | 45 | U | 45 | 41 | U | 41 |
| Carbazole | SVOA | 36 | U | 36 | 37 | U | 37 | 38 | U | 38 | 35 | U | 35 |
| Chrysene | SVOA | 27 | U | 27 | 45 | J | 28 | 130 | J | 29 | 26 | U | 26 |
| Dibenz[a,h]anthracene | SVOA | 19 | U | 19 | 20 | U | 20 | 20 | U | 20 | 18 | U | 18 |
| Dibenzofuran | SVOA | 20 | U | 20 | 21 | U | 21 | 21 | U | 21 | 19 | U | 19 |
| Diethyl phthalate | SVOA | 26 | U | 26 | 27 | U | 27 | 27 | U | 27 | 25 | U | 25 |
| Dimethyl phthalate | SVOA | 23 | U | 23 | 24 | U | 24 | 24 | U | 24 | 22 | U | 22 |
| Di-n-butylphthalate | SVOA | 29 | U | 29 | 30 | U | 30 | 31 | U | 31 | 28 | U | 28 |
| Di-n-octylphthalate | SVOA | 14 | U | 14 | 15 | U | 15 | 15 | U | 15 | 14 | U | 14 |
| Fluoranthene | SVOA | 36 | U | 36 | 78 | J | 37 | 230 | J | 38 | 44 | J | 35 |
| Fluorene | SVOA | 18 | U | 18 | 19 | U | 19 | 20 | J | 19 | 17 | U | 17 |
| Hexachlorobenzene | SVOA | 29 | U | 29 | 30 | U | 30 | 31 | U | 31 | 28 | U | 28 |
| Hexachlorobutadiene | SVOA | 9.9 | U | 9.9 | 10 | U | 10 | 11 | U | 11 | 9.6 | U | 9.6 |
| Hexachlorocyclopentadiene | SVOA | 49 | U | 49 | 52 | U | 52 | 53 | U | 53 | 48 | U | 48 |
| Hexachloroethane | SVOA | 21 | U | 21 | 22 | U | 22 | 23 | U | 23 | 20 | U | 20 |
| Indeno(1,2,3-cd)pyrene | SVOA | 22 | U | 22 | 23 | U | 23 | 59 | J | 23 | 21 | U | 21 |
| Isophorone | SVOA | 17 | U | 17 | 18 | U | 18 | 18 | U | 18 | 16 | U | 16 |
| Naphthalene | SVOA | 31 | U | 31 | 32 | U | 32 | 33 | U | 33 | 30 | U | 30 |
| Nitrobenzene | SVOA | 22 | U | 22 | 23 | U | 23 | 23 | U | 23 | 21 | U | 21 |
| N-Nitroso-di-n-dipropylamine | SVOA | 31 | U | 31 | 32 | U | 32 | 33 | U | 33 | 30 | U | 30 |
| N-Nitrosodiphenylamine | SVOA | 21 | U | 21 | 22 | U | 22 | 22 | U | 22 | 20 | U | 20 |
| Pentachlorophenol | SVOA | 330 | U | 330 | 340 | U | 340 | 350 | U | 350 | 320 | U | 320 |
| Phenanthrene | SVOA | 17 | U | 17 | 44 | J | 18 | 190 | J | 18 | 40 | J | 16 |
| Phenol | SVOA | 18 | U | 18 | 19 | U | 19 | 19 | U | 19 | 17 | U | 17 |
| Pyrene | SVOA | 12 | U | 12 | 71 | J | 13 | 310 | J | 13 | 36 | J | 12 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 45 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1V4L5, SPA-1 | | | J1V4N0, Duplicate of J1V4L5 | | | J1V4L6, SPA-2 | | | J1V4L7, SPA-3 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 02/26/15 | | | 02/26/15 | | | 02/26/15 | | | 02/26/15 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 29 | U | 29 | 28 | U | 28 | 27 | U | 27 | 29 | U | 29 |
| 1,2-Dichlorobenzene | SVOA | 23 | U | 23 | 22 | U | 22 | 21 | U | 21 | 23 | U | 23 |
| 1,3-Dichlorobenzene | SVOA | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 | 12 | U | 12 |
| 1,4-Dichlorobenzene | SVOA | 14 | U | 14 | 14 | U | 14 | 13 | U | 13 | 14 | U | 14 |
| 2,4,5-Trichlorophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 9.7 | U | 9.7 | 10 | U | 10 |
| 2,4,6-Trichlorophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 9.7 | U | 9.7 | 10 | U | 10 |
| 2,4-Dichlorophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 9.7 | U | 9.7 | 10 | U | 10 |
| 2,4-Dimethylphenol | SVOA | 68 | U | 68 | 66 | U | 66 | 64 | U | 64 | 68 | U | 68 |
| 2,4-Dinitrophenol | SVOA | 340 | U | 340 | 330 | U | 330 | 320 | U | 320 | 340 | U | 340 |
| 2,4-Dinitrotoluene | SVOA | 68 | U | 68 | 66 | U | 66 | 64 | U | 64 | 68 | U | 68 |
| 2,6-Dinitrotoluene | SVOA | 29 | U | 29 | 28 | U | 28 | 27 | U | 27 | 29 | U | 29 |
| 2-Chloronaphthalene | SVOA | 10 | U | 10 | 10 | U | 10 | 9.7 | U | 9.7 | 10 | U | 10 |
| 2-Chlorophenol | SVOA | 22 | U | 22 | 21 | U | 21 | 20 | U | 20 | 22 | U | 22 |
| 2-Methylnaphthalene | SVOA | 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 | 13 | U | 13 |
| 2-Nitroaniline | SVOA | 51 | U | 51 | 50 | U | 50 | 49 | U | 49 | 51 | U | 51 |
| 2-Nitrophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 9.7 | U | 9.7 | 10 | U | 10 |
| 3,3'-Dichlorobenzidine | SVOA | 92 | U | 92 | 90 | U | 90 | 87 | U | 87 | 92 | U | 92 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 34 | U | 34 | 33 | U | 33 | 32 | U | 32 | 34 | U | 34 |
| 3-Nitroaniline | SVOA | 75 | U | 75 | 73 | U | 73 | 71 | U | 71 | 75 | U | 75 |
| 4,6-Dinitro-2-methylphenol | SVOA | 340 | U | 340 | 330 | U | 330 | 320 | U | 320 | 340 | U | 340 |
| 4-Bromophenylphenyl ether | SVOA | 19 | U | 19 | 19 | U | 19 | 18 | U | 18 | 19 | U | 19 |
| 4-Chloro-3-methylphenol | SVOA | 68 | U | 68 | 66 | U | 66 | 64 | U | 64 | 68 | U | 68 |
| 4-Chloroaniline | SVOA | 84 | U | 84 | 82 | U | 82 | 80 | U | 80 | 84 | U | 84 |
| 4-Chlorophenylphenyl ether | SVOA | 22 | U | 22 | 21 | U | 21 | 20 | U | 20 | 22 | U | 22 |
| 4-Nitroaniline | SVOA | 74 | U | 74 | 72 | U | 72 | 70 | U | 70 | 74 | U | 74 |
| 4-Nitrophenol | SVOA | 99 | U | 99 | 97 | U | 97 | 94 | U | 94 | 100 | U | 100 |
| Acenaphthene | SVOA | 11 | U | 11 | 10 | U | 10 | 10 | U | 10 | 11 | U | 11 |
| Acenaphthylene | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 |
| Anthracene | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 |
| Benzo(a)anthracene | SVOA | 20 | U | 20 | 20 | U | 20 | 19 | U | 19 | 21 | U | 21 |
| Benzo(a)pyrene | SVOA | 20 | U | 20 | 20 | U | 20 | 19 | U | 19 | 21 | U | 21 |
| Benzo(b)fluoranthene | SVOA | 27 | U | 27 | 26 | U | 26 | 25 | U | 25 | 27 | U | 27 |
| Benzo(ghi)perylene | SVOA | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 |
| Benzo(k)fluoranthene | SVOA | 41 | U | 41 | 40 | U | 40 | 39 | U | 39 | 41 | U | 41 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 24 | U | 24 | 23 | U | 23 | 22 | U | 22 | 24 | U | 24 |
| Bis(2-Chloroethoxy)methane | SVOA | 24 | U | 24 | 23 | U | 23 | 22 | U | 22 | 24 | U | 24 |
| Bis(2-chloroethyl) ether | SVOA | 17 | U | 17 | 17 | U | 17 | 16 | U | 16 | 17 | U | 17 |
| Bis(2-ethylhexyl) phthalate | SVOA | 47 | U | 47 | 46 | U | 46 | 45 | U | 45 | 47 | U | 47 |
| Butylbenzylphthalate | SVOA | 44 | U | 44 | 43 | U | 43 | 42 | U | 42 | 44 | U | 44 |
| Carbazole | SVOA | 37 | U | 37 | 36 | U | 36 | 35 | U | 35 | 37 | U | 37 |
| Chrysene | SVOA | 28 | U | 28 | 27 | U | 27 | 26 | U | 26 | 28 | U | 28 |
| Dibenz[a,h]anthracene | SVOA | 19 | U | 19 | 19 | U | 19 | 18 | U | 18 | 19 | U | 19 |
| Dibenzofuran | SVOA | 20 | U | 20 | 20 | U | 20 | 19 | U | 19 | 21 | U | 21 |
| Diethyl phthalate | SVOA | 27 | U | 27 | 26 | U | 26 | 25 | U | 25 | 27 | U | 27 |
| Dimethyl phthalate | SVOA | 24 | U | 24 | 23 | U | 23 | 22 | U | 22 | 24 | U | 24 |
| Di-n-butylphthalate | SVOA | 30 | U | 30 | 29 | U | 29 | 28 | U | 28 | 30 | U | 30 |
| Di-n-octylphthalate | SVOA | 15 | U | 15 | 14 | U | 14 | 14 | U | 14 | 15 | U | 15 |
| Fluoranthene | SVOA | 37 | U | 37 | 36 | U | 36 | 35 | U | 35 | 37 | U | 37 |
| Fluorene | SVOA | 18 | U | 18 | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 |
| Hexachlorobenzene | SVOA | 30 | U | 30 | 29 | U | 29 | 28 | U | 28 | 30 | U | 30 |
| Hexachlorobutadiene | SVOA | 10 | U | 10 | 10 | U | 10 | 9.7 | U | 9.7 | 10 | U | 10 |
| Hexachlorocyclopentadiene | SVOA | 51 | U | 51 | 50 | U | 50 | 49 | U | 49 | 51 | U | 51 |
| Hexachloroethane | SVOA | 22 | U | 22 | 21 | U | 21 | 21 | U | 21 | 22 | U | 22 |
| Indeno(1,2,3-cd)pyrene | SVOA | 23 | U | 23 | 22 | U | 22 | 21 | U | 21 | 23 | U | 23 |
| Isophorone | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 |
| Naphthalene | SVOA | 32 | U | 32 | 31 | U | 31 | 30 | U | 30 | 32 | U | 32 |
| Nitrobenzene | SVOA | 23 | U | 23 | 22 | U | 22 | 21 | U | 21 | 23 | U | 23 |
| N-Nitroso-di-n-dipropylamine | SVOA | 32 | U | 32 | 31 | U | 31 | 30 | U | 30 | 32 | U | 32 |
| N-Nitrosodiphenylamine | SVOA | 22 | U | 22 | 21 | U | 21 | 20 | U | 20 | 22 | U | 22 |
| Pentachlorophenol | SVOA | 340 | U | 340 | 330 | U | 330 | 320 | U | 320 | 340 | U | 340 |
| Phenanthrene | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 |
| Phenol | SVOA | 18 | U | 18 | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 |
| Pyrene | SVOA | 12 | U | 12 | 12 | U | 12 | 13 | J | 12 | 12 | U | 12 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 46 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1V4L8, SPA-4 | | | J1V4L9, SPA-5 | | | J1V4M0, SPA-6 | | | J1V4M1, SPA-7 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 02/26/15 | | | 02/26/15 | | | 02/26/15 | | | 02/26/15 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 29 | U | 29 | 28 | U | 28 | 28 | U | 28 | 28 | U | 28 |
| 1,2-Dichlorobenzene | SVOA | 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 |
| 1,4-Dichlorobenzene | SVOA | 14 | U | 14 | 14 | U | 14 | 14 | U | 14 | 14 | U | 14 |
| 2,4,5-Trichlorophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| 2,4,6-Trichlorophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| 2,4-Dichlorophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| 2,4-Dimethylphenol | SVOA | 68 | U | 68 | 66 | U | 66 | 67 | U | 67 | 67 | U | 67 |
| 2,4-Dinitrophenol | SVOA | 340 | U | 340 | 330 | U | 330 | 340 | U | 340 | 340 | U | 340 |
| 2,4-Dinitrotoluene | SVOA | 68 | U | 68 | 66 | U | 66 | 67 | U | 67 | 67 | U | 67 |
| 2,6-Dinitrotoluene | SVOA | 29 | U | 29 | 28 | U | 28 | 28 | U | 28 | 28 | U | 28 |
| 2-Chloronaphthalene | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| 2-Chlorophenol | SVOA | 22 | U | 22 | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 |
| 2-Methylnaphthalene | SVOA | 19 | U | 19 | 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 |
| 2-Nitroaniline | SVOA | 51 | U | 51 | 50 | U | 50 | 51 | U | 51 | 51 | U | 51 |
| 2-Nitrophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| 3,3'-Dichlorobenzidine | SVOA | 92 | U | 92 | 90 | U | 90 | 91 | U | 91 | 92 | U | 92 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 34 | U | 34 | 33 | U | 33 | 33 | U | 33 | 34 | U | 34 |
| 3-Nitroaniline | SVOA | 75 | U | 75 | 73 | U | 73 | 74 | U | 74 | 74 | U | 74 |
| 4,6-Dinitro-2-methylphenol | SVOA | 340 | U | 340 | 330 | U | 330 | 330 | U | 330 | 340 | U | 340 |
| 4-Bromophenylphenyl ether | SVOA | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 |
| 4-Chloro-3-methylphenol | SVOA | 68 | U | 68 | 66 | U | 66 | 67 | U | 67 | 67 | U | 67 |
| 4-Chloroaniline | SVOA | 84 | U | 84 | 82 | U | 82 | 83 | U | 83 | 83 | U | 83 |
| 4-Chlorophenylphenyl ether | SVOA | 22 | U | 22 | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 |
| 4-Nitroaniline | SVOA | 74 | U | 74 | 72 | U | 72 | 74 | U | 74 | 74 | U | 74 |
| 4-Nitrophenol | SVOA | 100 | U | 100 | 97 | U | 97 | 98 | U | 98 | 99 | U | 99 |
| Acenaphthene | SVOA | 11 | J | 11 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| Acenaphthylene | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 |
| Anthracene | SVOA | 26 | J | 17 | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 |
| Benzo(a)anthracene | SVOA | 88 | J | 21 | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 |
| Benzo(a)pyrene | SVOA | 83 | J | 21 | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 |
| Benzo(b)fluoranthene | SVOA | 140 | JX | 27 | 26 | U | 26 | 27 | U | 27 | 27 | U | 27 |
| Benzo(ghi)perylene | SVOA | 53 | J | 16 | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 |
| Benzo(k)fluoranthene | SVOA | 41 | UX | 41 | 40 | U | 40 | 41 | U | 41 | 41 | U | 41 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 24 | U | 24 | 23 | U | 23 | 23 | U | 23 | 23 | U | 23 |
| Bis(2-Chloroethoxy)methane | SVOA | 24 | U | 24 | 23 | U | 23 | 23 | U | 23 | 23 | U | 23 |
| Bis(2-chloroethyl) ether | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 |
| Bis(2-ethylhexyl) phthalate | SVOA | 47 | U | 47 | 46 | U | 46 | 47 | U | 47 | 47 | U | 47 |
| Butylbenzylphthalate | SVOA | 44 | U | 44 | 43 | U | 43 | 44 | U | 44 | 44 | U | 44 |
| Carbazole | SVOA | 37 | U | 37 | 36 | U | 36 | 37 | U | 37 | 37 | U | 37 |
| Chrysene | SVOA | 100 | J | 28 | 27 | U | 27 | 27 | U | 27 | 27 | U | 27 |
| Dibenz[a,h]anthracene | SVOA | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 |
| Dibenzofuran | SVOA | 21 | U | 21 | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 |
| Diethyl phthalate | SVOA | 27 | U | 27 | 26 | U | 26 | 26 | U | 26 | 26 | U | 26 |
| Dimethyl phthalate | SVOA | 24 | U | 24 | 23 | U | 23 | 23 | U | 23 | 23 | U | 23 |
| Di-n-butylphthalate | SVOA | 30 | U | 30 | 29 | U | 29 | 29 | U | 29 | 30 | U | 30 |
| Di-n-octylphthalate | SVOA | 15 | U | 15 | 14 | U | 14 | 15 | U | 15 | 15 | U | 15 |
| Fluoranthene | SVOA | 190 | J | 37 | 36 | U | 36 | 37 | U | 37 | 37 | J | 37 |
| Fluorene | SVOA | 18 | U | 18 | 18 | U | 18 | 18 | U | 18 | 18 | U | 18 |
| Hexachlorobenzene | SVOA | 30 | U | 30 | 29 | U | 29 | 29 | U | 29 | 30 | U | 30 |
| Hexachlorobutadiene | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| Hexachlorocyclopentadiene | SVOA | 51 | U | 51 | 50 | U | 50 | 51 | U | 51 | 51 | U | 51 |
| Hexachloroethane | SVOA | 22 | U | 22 | 21 | U | 21 | 22 | U | 22 | 22 | U | 22 |
| Indeno(1,2,3-cd)pyrene | SVOA | 51 | J | 23 | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 |
| Isophorone | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 |
| Naphthalene | SVOA | 32 | U | 32 | 31 | U | 31 | 31 | U | 31 | 32 | U | 32 |
| Nitrobenzene | SVOA | 23 | U | 23 | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 |
| N-Nitroso-di-n-dipropylamine | SVOA | 32 | U | 32 | 31 | U | 31 | 31 | U | 31 | 32 | U | 32 |
| N-Nitrosodiphenylamine | SVOA | 22 | U | 22 | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 |
| Pentachlorophenol | SVOA | 340 | U | 340 | 330 | U | 330 | 330 | U | 330 | 340 | U | 340 |
| Phenanthrene | SVOA | 150 | J | 17 | 17 | U | 17 | 17 | U | 17 | 24 | J | 17 |
| Phenol | SVOA | 18 | U | 18 | 18 | U | 18 | 18 | U | 18 | 18 | U | 18 |
| Pyrene | SVOA | 210 | J | 12 | 12 | U | 12 | 12 | U | 12 | 35 | J | 12 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 47 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1V4M2, SPA-8 | | | J1V4M3, SPA-9 | | | J1V4M4, SPA-10 | | | J1V4M5, SPA-11 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 02/26/15 | | | 02/26/15 | | | 02/26/15 | | | 04/02/15 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 30 | U | 30 | 29 | U | 29 | 29 | U | 29 | 27 | U | 27 |
| 1,2-Dichlorobenzene | SVOA | 23 | U | 23 | 23 | U | 23 | 22 | U | 22 | 21 | U | 21 |
| 1,3-Dichlorobenzene | SVOA | 13 | U | 13 | 12 | U | 12 | 12 | U | 12 | 11 | U | 11 |
| 1,4-Dichlorobenzene | SVOA | 14 | U | 14 | 14 | U | 14 | 14 | U | 14 | 13 | U | 13 |
| 2,4,5-Trichlorophenol | SVOA | 11 | U | 11 | 10 | U | 10 | 10 | U | 10 | 9.5 | U | 9.5 |
| 2,4,6-Trichlorophenol | SVOA | 11 | U | 11 | 10 | U | 10 | 10 | U | 10 | 9.5 | U | 9.5 |
| 2,4-Dichlorophenol | SVOA | 11 | U | 11 | 10 | U | 10 | 10 | U | 10 | 9.5 | U | 9.5 |
| 2,4-Dimethylphenol | SVOA | 70 | U | 70 | 68 | U | 68 | 67 | U | 67 | 63 | U | 63 |
| 2,4-Dinitrophenol | SVOA | 350 | U | 350 | 350 | U | 350 | 340 | U | 340 | 320 | U | 320 |
| 2,4-Dinitrotoluene | SVOA | 70 | U | 70 | 68 | U | 68 | 67 | U | 67 | 63 | U | 63 |
| 2,6-Dinitrotoluene | SVOA | 30 | U | 30 | 29 | U | 29 | 29 | U | 29 | 27 | U | 27 |
| 2-Chloronaphthalene | SVOA | 11 | U | 11 | 10 | U | 10 | 10 | U | 10 | 9.5 | U | 9.5 |
| 2-Chlorophenol | SVOA | 22 | U | 22 | 22 | U | 22 | 21 | U | 21 | 20 | U | 20 |
| 2-Methylnaphthalene | SVOA | 20 | U | 20 | 20 | U | 20 | 19 | U | 19 | 18 | U | 18 |
| 2-Methylphenol (cresol, o-) | SVOA | 14 | U | 14 | 13 | U | 13 | 13 | U | 13 | 12 | U | 12 |
| 2-Nitroaniline | SVOA | 53 | U | 53 | 52 | U | 52 | 51 | U | 51 | 48 | U | 48 |
| 2-Nitrophenol | SVOA | 11 | U | 11 | 10 | U | 10 | 10 | U | 10 | 9.5 | U | 9.5 |
| 3,3'-Dichlorobenzidine | SVOA | 95 | U | 95 | 93 | U | 93 | 92 | U | 92 | 86 | U | 86 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 35 | U | 35 | 34 | U | 34 | 34 | U | 34 | 32 | U | 32 |
| 3-Nitroaniline | SVOA | 77 | U | 77 | 76 | U | 76 | 74 | U | 74 | 70 | U | 70 |
| 4,6-Dinitro-2-methylphenol | SVOA | 350 | U | 350 | 340 | U | 340 | 340 | U | 340 | 320 | U | 320 |
| 4-Bromophenylphenyl ether | SVOA | 20 | U | 20 | 20 | U | 20 | 19 | U | 19 | 18 | U | 18 |
| 4-Chloro-3-methylphenol | SVOA | 70 | U | 70 | 68 | U | 68 | 67 | U | 67 | 63 | U | 63 |
| 4-Chloroaniline | SVOA | 87 | U | 87 | 85 | U | 85 | 84 | U | 84 | 78 | U | 78 |
| 4-Chlorophenylphenyl ether | SVOA | 22 | U | 22 | 22 | U | 22 | 21 | U | 21 | 20 | U | 20 |
| 4-Nitroaniline | SVOA | 77 | U | 77 | 75 | U | 75 | 74 | U | 74 | 69 | U | 69 |
| 4-Nitrophenol | SVOA | 100 | U | 100 | 100 | U | 100 | 99 | U | 99 | 93 | U | 93 |
| Acenaphthene | SVOA | 11 | U | 11 | 11 | U | 11 | 11 | U | 11 | 9.8 | U | 9.8 |
| Acenaphthylene | SVOA | 18 | U | 18 | 18 | U | 18 | 17 | U | 17 | 16 | U | 16 |
| Anthracene | SVOA | 18 | U | 18 | 18 | U | 18 | 17 | U | 17 | 16 | U | 16 |
| Benzo(a)anthracene | SVOA | 21 | U | 21 | 21 | U | 21 | 20 | U | 20 | 19 | U | 19 |
| Benzo(a)pyrene | SVOA | 21 | U | 21 | 21 | U | 21 | 20 | U | 20 | 19 | U | 19 |
| Benzo(b)fluoranthene | SVOA | 28 | U | 28 | 27 | U | 27 | 27 | U | 27 | 25 | U | 25 |
| Benzo(ghi)perylene | SVOA | 17 | U | 17 | 17 | U | 17 | 16 | U | 16 | 15 | U | 15 |
| Benzo(k)fluoranthene | SVOA | 42 | U | 42 | 41 | U | 41 | 41 | U | 41 | 38 | U | 38 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 24 | U | 24 | 24 | U | 24 | 23 | U | 23 | 22 | U | 22 |
| Bis(2-Chloroethoxy)methane | SVOA | 24 | U | 24 | 24 | U | 24 | 23 | U | 23 | 22 | U | 22 |
| Bis(2-chloroethyl) ether | SVOA | 18 | U | 18 | 17 | U | 17 | 17 | U | 17 | 16 | U | 16 |
| Bis(2-ethylhexyl) phthalate | SVOA | 49 | U | 49 | 48 | U | 48 | 47 | U | 47 | 44 | U | 44 |
| Butylbenzylphthalate | SVOA | 45 | U | 45 | 45 | U | 45 | 44 | U | 44 | 41 | U | 41 |
| Carbazole | SVOA | 38 | U | 38 | 37 | U | 37 | 37 | U | 37 | 34 | U | 34 |
| Chrysene | SVOA | 29 | U | 29 | 28 | U | 28 | 28 | U | 28 | 26 | U | 26 |
| Dibenz[a,h]anthracene | SVOA | 20 | U | 20 | 20 | U | 20 | 19 | U | 19 | 18 | U | 18 |
| Dibenzofuran | SVOA | 21 | U | 21 | 21 | U | 21 | 20 | U | 20 | 19 | U | 19 |
| Diethyl phthalate | SVOA | 27 | U | 27 | 27 | U | 27 | 27 | U | 27 | 25 | U | 25 |
| Dimethyl phthalate | SVOA | 24 | U | 24 | 24 | U | 24 | 23 | U | 23 | 22 | U | 22 |
| Di-n-butylphthalate | SVOA | 31 | U | 31 | 30 | U | 30 | 30 | U | 30 | 28 | U | 28 |
| Di-n-octylphthalate | SVOA | 15 | U | 15 | 15 | U | 15 | 15 | U | 15 | 14 | U | 14 |
| Fluoranthene | SVOA | 38 | U | 38 | 37 | U | 37 | 37 | U | 37 | 34 | U | 34 |
| Fluorene | SVOA | 19 | U | 19 | 19 | U | 19 | 18 | U | 18 | 17 | U | 17 |
| Hexachlorobenzene | SVOA | 31 | U | 31 | 30 | U | 30 | 30 | U | 30 | 28 | U | 28 |
| Hexachlorobutadiene | SVOA | 11 | U | 11 | 10 | U | 10 | 10 | U | 10 | 9.5 | U | 9.5 |
| Hexachlorocyclopentadiene | SVOA | 53 | U | 53 | 52 | U | 52 | 51 | U | 51 | 48 | U | 48 |
| Hexachloroethane | SVOA | 23 | U | 23 | 22 | U | 22 | 22 | U | 22 | 20 | U | 20 |
| Indeno(1,2,3-cd)pyrene | SVOA | 23 | U | 23 | 23 | U | 23 | 22 | U | 22 | 21 | U | 21 |
| Isophorone | SVOA | 18 | U | 18 | 18 | U | 18 | 17 | U | 17 | 16 | U | 16 |
| Naphthalene | SVOA | 33 | U | 33 | 32 | U | 32 | 32 | U | 32 | 30 | U | 30 |
| Nitrobenzene | SVOA | 23 | U | 23 | 23 | U | 23 | 22 | U | 22 | 21 | U | 21 |
| N-Nitroso-di-n-dipropylamine | SVOA | 33 | U | 33 | 32 | U | 32 | 32 | U | 32 | 30 | U | 30 |
| N-Nitrosodiphenylamine | SVOA | 22 | U | 22 | 22 | U | 22 | 21 | U | 21 | 20 | U | 20 |
| Pentachlorophenol | SVOA | 350 | U | 350 | 340 | U | 340 | 340 | U | 340 | 320 | U | 320 |
| Phenanthrene | SVOA | 18 | U | 18 | 18 | U | 18 | 20 | J | 17 | 16 | U | 16 |
| Phenol | SVOA | 19 | U | 19 | 19 | U | 19 | 18 | U | 18 | 17 | U | 17 |
| Pyrene | SVOA | 13 | U | 13 | 13 | U | 13 | 25 | J | 12 | 12 | U | 12 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 48 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1V4M6, SPA-12 | | | J1V4M7, SPA-13 | | | J1V4M8, SPA-14 | | | J1V4M9, SPA-15 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 04/02/15 | | | 02/26/15 | | | 02/26/15 | | | 04/02/15 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 29 | U | 29 | 30 | U | 30 | 28 | U | 28 | 29 | UX | 29 |
| 1,2-Dichlorobenzene | SVOA | 23 | U | 23 | 23 | U | 23 | 22 | U | 22 | 23 | UX | 23 |
| 1,3-Dichlorobenzene | SVOA | 13 | U | 13 | 13 | U | 13 | 12 | U | 12 | 12 | UX | 12 |
| 1,4-Dichlorobenzene | SVOA | 14 | U | 14 | 14 | U | 14 | 14 | U | 14 | 14 | UX | 14 |
| 2,4,5-Trichlorophenol | SVOA | 10 | U | 10 | 11 | U | 11 | 10 | U | 10 | 10 | UX | 10 |
| 2,4,6-Trichlorophenol | SVOA | 10 | U | 10 | 11 | U | 11 | 10 | U | 10 | 10 | UX | 10 |
| 2,4-Dichlorophenol | SVOA | 10 | U | 10 | 11 | U | 11 | 10 | U | 10 | 10 | UX | 10 |
| 2,4-Dimethylphenol | SVOA | 69 | U | 69 | 70 | U | 70 | 67 | U | 67 | 68 | U | 68 |
| 2,4-Dinitrophenol | SVOA | 350 | U | 350 | 350 | U | 350 | 340 | U | 340 | 340 | UX | 340 |
| 2,4-Dinitrotoluene | SVOA | 69 | U | 69 | 70 | U | 70 | 67 | U | 67 | 68 | UX | 68 |
| 2,6-Dinitrotoluene | SVOA | 29 | U | 29 | 30 | U | 30 | 28 | U | 28 | 29 | UX | 29 |
| 2-Chloronaphthalene | SVOA | 10 | U | 10 | 11 | U | 11 | 10 | U | 10 | 10 | UX | 10 |
| 2-Chlorophenol | SVOA | 22 | U | 22 | 22 | U | 22 | 21 | U | 21 | 22 | UX | 22 |
| 2-Methylnaphthalene | SVOA | 20 | U | 20 | 20 | U | 20 | 19 | U | 19 | 20 | UX | 20 |
| 2-Methylphenol (cresol, o-) | SVOA | 14 | U | 14 | 14 | U | 14 | 13 | U | 13 | 13 | UX | 13 |
| 2-Nitroaniline | SVOA | 52 | U | 52 | 53 | U | 53 | 51 | U | 51 | 52 | UX | 52 |
| 2-Nitrophenol | SVOA | 10 | U | 10 | 11 | U | 11 | 10 | U | 10 | 10 | UX | 10 |
| 3,3'-Dichlorobenzidine | SVOA | 94 | U | 94 | 95 | U | 95 | 91 | U | 91 | 93 | U | 93 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 35 | U | 35 | 35 | U | 35 | 33 | U | 33 | 34 | U | 34 |
| 3-Nitroaniline | SVOA | 76 | U | 76 | 77 | U | 77 | 74 | U | 74 | 76 | U | 76 |
| 4,6-Dinitro-2-methylphenol | SVOA | 350 | U | 350 | 350 | U | 350 | 330 | U | 330 | 340 | UX | 340 |
| 4-Bromophenylphenyl ether | SVOA | 20 | U | 20 | 20 | U | 20 | 19 | U | 19 | 20 | UX | 20 |
| 4-Chloro-3-methylphenol | SVOA | 69 | U | 69 | 70 | U | 70 | 67 | U | 67 | 68 | UX | 68 |
| 4-Chloroaniline | SVOA | 86 | U | 86 | 87 | U | 87 | 83 | U | 83 | 85 | U | 85 |
| 4-Chlorophenylphenyl ether | SVOA | 22 | U | 22 | 22 | U | 22 | 21 | U | 21 | 22 | UX | 22 |
| 4-Nitroaniline | SVOA | 76 | U | 76 | 77 | U | 77 | 73 | U | 73 | 75 | UX | 75 |
| 4-Nitrophenol | SVOA | 100 | U | 100 | 100 | U | 100 | 98 | U | 98 | 100 | UX | 100 |
| Acenaphthene | SVOA | 11 | U | 11 | 11 | U | 11 | 10 | U | 10 | 11 | UX | 11 |
| Acenaphthylene | SVOA | 18 | U | 18 | 18 | U | 18 | 17 | U | 17 | 18 | UX | 18 |
| Anthracene | SVOA | 18 | U | 18 | 18 | U | 18 | 17 | U | 17 | 18 | UX | 18 |
| Benzo(a)anthracene | SVOA | 21 | U | 21 | 21 | U | 21 | 27 | J | 20 | 32 | JX | 21 |
| Benzo(a)pyrene | SVOA | 21 | U | 21 | 21 | U | 21 | 20 | U | 20 | 30 | JX | 21 |
| Benzo(b)fluoranthene | SVOA | 27 | U | 27 | 28 | U | 28 | 27 | U | 27 | 38 | JX | 27 |
| Benzo(ghi)perylene | SVOA | 17 | U | 17 | 17 | U | 17 | 16 | U | 16 | 25 | JX | 17 |
| Benzo(k)fluoranthene | SVOA | 42 | U | 42 | 42 | U | 42 | 40 | U | 40 | 41 | UX | 41 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 24 | U | 24 | 24 | U | 24 | 23 | U | 23 | 24 | UX | 24 |
| Bis(2-Chloroethoxy)methane | SVOA | 24 | U | 24 | 24 | U | 24 | 23 | U | 23 | 24 | UX | 24 |
| Bis(2-chloroethyl) ether | SVOA | 17 | U | 17 | 18 | U | 18 | 17 | U | 17 | 17 | U | 17 |
| Bis(2-ethylhexyl) phthalate | SVOA | 48 | U | 48 | 49 | U | 49 | 47 | U | 47 | 48 | UX | 48 |
| Butylbenzylphthalate | SVOA | 45 | U | 45 | 46 | U | 46 | 44 | U | 44 | 44 | UX | 44 |
| Carbazole | SVOA | 38 | U | 38 | 38 | U | 38 | 36 | U | 36 | 37 | UX | 37 |
| Chrysene | SVOA | 28 | U | 28 | 29 | U | 29 | 38 | J | 27 | 37 | JX | 28 |
| Dibenz[a,h]anthracene | SVOA | 20 | U | 20 | 20 | U | 20 | 19 | U | 19 | 20 | U | 20 |
| Dibenzofuran | SVOA | 21 | U | 21 | 21 | U | 21 | 20 | U | 20 | 21 | UX | 21 |
| Diethyl phthalate | SVOA | 27 | U | 27 | 28 | U | 28 | 26 | U | 26 | 27 | UX | 27 |
| Dimethyl phthalate | SVOA | 24 | U | 24 | 24 | U | 24 | 23 | U | 23 | 24 | UX | 24 |
| Di-n-butylphthalate | SVOA | 30 | U | 30 | 31 | U | 31 | 29 | U | 29 | 30 | UX | 30 |
| Di-n-octylphthalate | SVOA | 15 | U | 15 | 15 | U | 15 | 15 | U | 15 | 15 | UX | 15 |
| Fluoranthene | SVOA | 40 | J | 38 | 38 | U | 38 | 61 | J | 36 | 57 | JX | 37 |
| Fluorene | SVOA | 19 | U | 19 | 19 | U | 19 | 18 | U | 18 | 19 | UX | 19 |
| Hexachlorobenzene | SVOA | 30 | U | 30 | 31 | U | 31 | 29 | U | 29 | 30 | UX | 30 |
| Hexachlorobutadiene | SVOA | 10 | U | 10 | 11 | U | 11 | 10 | U | 10 | 10 | UX | 10 |
| Hexachlorocyclopentadiene | SVOA | 52 | U | 52 | 53 | U | 53 | 51 | U | 51 | 52 | UX | 52 |
| Hexachloroethane | SVOA | 22 | U | 22 | 23 | U | 23 | 22 | U | 22 | 22 | UX | 22 |
| Indeno(1,2,3-cd)pyrene | SVOA | 23 | U | 23 | 23 | U | 23 | 22 | U | 22 | 23 | UX | 23 |
| Isophorone | SVOA | 18 | U | 18 | 18 | U | 18 | 17 | U | 17 | 18 | UX | 18 |
| Naphthalene | SVOA | 32 | U | 32 | 33 | U | 33 | 31 | U | 31 | 32 | UX | 32 |
| Nitrobenzene | SVOA | 23 | U | 23 | 23 | U | 23 | 22 | U | 22 | 23 | UX | 23 |
| N-Nitroso-di-n-dipropylamine | SVOA | 32 | U | 32 | 33 | U | 33 | 31 | U | 31 | 32 | U | 32 |
| N-Nitrosodiphenylamine | SVOA | 22 | U | 22 | 22 | U | 22 | 21 | U | 21 | 22 | UX | 22 |
| Pentachlorophenol | SVOA | 350 | U | 350 | 350 | U | 350 | 330 | U | 330 | 340 | UX | 340 |
| Phenanthrene | SVOA | 24 | J | 18 | 18 | U | 18 | 58 | J | 17 | 31 | JX | 18 |
| Phenol | SVOA | 19 | U | 19 | 19 | U | 19 | 18 | U | 18 | 19 | UX | 19 |
| Pyrene | SVOA | 34 | J | 13 | 29 | J | 13 | 89 | J | 12 | 60 | JX | 13 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 49 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1V4N1, OVB-9[a] | | | J1V4N3, Duplicate of J1V4N1[a] | | | J1V255, OVB-1 | | | J1V256, OVB-2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 02/26/15 | | | 02/26/15 | | | 12/10/14 | | | 12/10/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 29 | U | 29 | 27 | U | 27 | 30 | U | 30 | 29 | U | 29 |
| 1,2-Dichlorobenzene | SVOA | 23 | U | 23 | 21 | U | 21 | 23 | U | 23 | 23 | U | 23 |
| 1,3-Dichlorobenzene | SVOA | 13 | U | 13 | 12 | U | 12 | 13 | U | 13 | 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 | 9.7 | U | 9.7 | 11 | U | 11 | 10 | U | 10 |
| 2,4,6-Trichlorophenol | SVOA | 10 | U | 10 | 9.7 | U | 9.7 | 11 | U | 11 | 10 | U | 10 |
| 2,4-Dichlorophenol | SVOA | 10 | U | 10 | 9.7 | U | 9.7 | 11 | U | 11 | 10 | U | 10 |
| 2,4-Dimethylphenol | SVOA | 69 | U | 69 | 64 | U | 64 | 70 | U | 70 | 68 | U | 68 |
| 2,4-Dinitrophenol | SVOA | 350 | U | 350 | 320 | U | 320 | 350 | U | 350 | 340 | U | 340 |
| 2,4-Dinitrotoluene | SVOA | 69 | U | 69 | 64 | U | 64 | 70 | U | 70 | 68 | U | 68 |
| 2,6-Dinitrotoluene | SVOA | 29 | U | 29 | 27 | U | 27 | 30 | U | 30 | 29 | U | 29 |
| 2-Chloronaphthalene | SVOA | 10 | U | 10 | 9.7 | U | 9.7 | 11 | U | 11 | 10 | U | 10 |
| 2-Chlorophenol | SVOA | 22 | U | 22 | 20 | U | 20 | 22 | U | 22 | 22 | U | 22 |
| 2-Methylnaphthalene | SVOA | 20 | U | 20 | 18 | U | 18 | 20 | U | 20 | 20 | U | 20 |
| 2-Methylphenol (cresol, o-) | SVOA | 14 | U | 14 | 13 | U | 13 | 14 | U | 14 | 13 | U | 13 |
| 2-Nitroaniline | SVOA | 52 | U | 52 | 48 | U | 48 | 53 | U | 53 | 52 | U | 52 |
| 2-Nitrophenol | SVOA | 10 | U | 10 | 9.7 | U | 9.7 | 11 | U | 11 | 10 | U | 10 |
| 3,3'-Dichlorobenzidine | SVOA | 94 | U | 94 | 87 | U | 87 | 96 | U | 96 | 93 | U | 93 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 35 | U | 35 | 32 | U | 32 | 35 | U | 35 | 34 | U | 34 |
| 3-Nitroaniline | SVOA | 76 | U | 76 | 71 | U | 71 | 78 | U | 78 | 76 | U | 76 |
| 4,6-Dinitro-2-methylphenol | SVOA | 350 | U | 350 | 320 | U | 320 | 350 | U | 350 | 340 | U | 340 |
| 4-Bromophenylphenyl ether | SVOA | 20 | U | 20 | 18 | U | 18 | 20 | U | 20 | 20 | U | 20 |
| 4-Chloro-3-methylphenol | SVOA | 69 | U | 69 | 64 | U | 64 | 70 | U | 70 | 68 | U | 68 |
| 4-Chloroaniline | SVOA | 86 | U | 86 | 79 | U | 79 | 87 | U | 87 | 85 | U | 85 |
| 4-Chlorophenylphenyl ether | SVOA | 22 | U | 22 | 20 | U | 20 | 22 | U | 22 | 22 | U | 22 |
| 4-Nitroaniline | SVOA | 76 | U | 76 | 70 | U | 70 | 77 | U | 77 | 75 | U | 75 |
| 4-Nitrophenol | SVOA | 100 | U | 100 | 94 | U | 94 | 100 | U | 100 | 100 | U | 100 |
| Acenaphthene | SVOA | 11 | U | 11 | 10 | U | 10 | 11 | U | 11 | 11 | U | 11 |
| Acenaphthylene | SVOA | 18 | U | 18 | 16 | U | 16 | 18 | U | 18 | 18 | U | 18 |
| Anthracene | SVOA | 18 | U | 18 | 16 | U | 16 | 18 | U | 18 | 18 | U | 18 |
| Benzo(a)anthracene | SVOA | 21 | U | 21 | 19 | U | 19 | 21 | J | 21 | 21 | U | 21 |
| Benzo(a)pyrene | SVOA | 21 | U | 21 | 19 | U | 19 | 21 | U | 21 | 21 | U | 21 |
| Benzo(b)fluoranthene | SVOA | 27 | U | 27 | 25 | U | 25 | 28 | U | 28 | 27 | U | 27 |
| Benzo(ghi)perylene | SVOA | 17 | U | 17 | 15 | U | 15 | 17 | U | 17 | 17 | U | 17 |
| Benzo(k)fluoranthene | SVOA | 42 | U | 42 | 39 | U | 39 | 43 | U | 43 | 41 | U | 41 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 24 | U | 24 | 22 | U | 22 | 24 | U | 24 | 24 | U | 24 |
| Bis(2-Chloroethoxy)methane | SVOA | 24 | U | 24 | 22 | U | 22 | 24 | U | 24 | 24 | U | 24 |
| Bis(2-chloroethyl) ether | SVOA | 17 | U | 17 | 16 | U | 16 | 18 | U | 18 | 17 | U | 17 |
| Bis(2-ethylhexyl) phthalate | SVOA | 48 | U | 48 | 44 | U | 44 | 49 | U | 49 | 48 | U | 48 |
| Butylbenzylphthalate | SVOA | 45 | U | 45 | 42 | U | 42 | 46 | U | 46 | 44 | U | 44 |
| Carbazole | SVOA | 38 | U | 38 | 35 | U | 35 | 38 | U | 38 | 37 | U | 37 |
| Chrysene | SVOA | 28 | U | 28 | 26 | U | 26 | 29 | U | 29 | 28 | U | 28 |
| Dibenz[a,h]anthracene | SVOA | 20 | U | 20 | 18 | U | 18 | 20 | U | 20 | 20 | U | 20 |
| Dibenzofuran | SVOA | 21 | U | 21 | 19 | U | 19 | 21 | U | 21 | 21 | U | 21 |
| Diethyl phthalate | SVOA | 27 | U | 27 | 25 | U | 25 | 28 | U | 28 | 27 | U | 27 |
| Dimethyl phthalate | SVOA | 24 | U | 24 | 22 | U | 22 | 24 | U | 24 | 24 | U | 24 |
| Di-n-butylphthalate | SVOA | 30 | U | 30 | 28 | U | 28 | 31 | U | 31 | 30 | U | 30 |
| Di-n-octylphthalate | SVOA | 15 | UX | 15 | 14 | UX | 14 | 15 | U | 15 | 15 | U | 15 |
| Fluoranthene | SVOA | 38 | U | 38 | 35 | U | 35 | 38 | U | 38 | 37 | U | 37 |
| Fluorene | SVOA | 19 | U | 19 | 17 | U | 17 | 19 | U | 19 | 19 | U | 19 |
| Hexachlorobenzene | SVOA | 30 | U | 30 | 28 | U | 28 | 31 | U | 31 | 30 | U | 30 |
| Hexachlorobutadiene | SVOA | 10 | U | 10 | 9.7 | U | 9.7 | 11 | U | 11 | 10 | U | 10 |
| Hexachlorocyclopentadiene | SVOA | 52 | U | 52 | 48 | U | 48 | 53 | U | 53 | 52 | U | 52 |
| Hexachloroethane | SVOA | 22 | U | 22 | 21 | U | 21 | 23 | U | 23 | 22 | U | 22 |
| Indeno(1,2,3-cd)pyrene | SVOA | 23 | U | 23 | 21 | U | 21 | 23 | U | 23 | 23 | U | 23 |
| Isophorone | SVOA | 18 | U | 18 | 16 | U | 16 | 18 | U | 18 | 18 | U | 18 |
| Naphthalene | SVOA | 32 | U | 32 | 30 | U | 30 | 33 | U | 33 | 32 | U | 32 |
| Nitrobenzene | SVOA | 23 | U | 23 | 21 | U | 21 | 23 | U | 23 | 23 | U | 23 |
| N-Nitroso-di-n-dipropylamine | SVOA | 32 | U | 32 | 30 | U | 30 | 33 | U | 33 | 32 | U | 32 |
| N-Nitrosodiphenylamine | SVOA | 22 | U | 22 | 20 | U | 20 | 22 | U | 22 | 22 | U | 22 |
| Pentachlorophenol | SVOA | 350 | UX | 350 | 320 | UX | 320 | 350 | U | 350 | 340 | U | 340 |
| Phenanthrene | SVOA | 18 | U | 18 | 16 | U | 16 | 18 | U | 18 | 18 | U | 18 |
| Phenol | SVOA | 19 | U | 19 | 17 | U | 17 | 19 | U | 19 | 19 | U | 19 |
| Pyrene | SVOA | 13 | U | 13 | 12 | U | 12 | 24 | J | 13 | 13 | U | 13 |

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|---|---|---|---|
| Attachment | 1 | Sheet No. | 50 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1V257, OVB-3 | | | J1V258, OVB-4 | | | J1V259, OVB-5 | | | J1V260, OVB-6 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/10/14 | | | 12/10/14 | | | 12/10/14 | | | 12/10/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 28 | U | 28 | 28 | U | 28 | 28 | U | 28 | 28 | U | 28 |
| 1,2-Dichlorobenzene | SVOA | 22 | U | 22 | 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 |
| 1,4-Dichlorobenzene | SVOA | 14 | U | 14 | 14 | U | 14 | 14 | U | 14 | 13 | U | 13 |
| 2,4,5-Trichlorophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 9.9 | U | 9.9 |
| 2,4,6-Trichlorophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 9.9 | U | 9.9 |
| 2,4-Dichlorophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 9.9 | U | 9.9 |
| 2,4-Dimethylphenol | SVOA | 66 | U | 66 | 67 | U | 67 | 67 | U | 67 | 65 | U | 65 |
| 2,4-Dinitrophenol | SVOA | 330 | U | 330 | 340 | U | 340 | 340 | U | 340 | 330 | U | 330 |
| 2,4-Dinitrotoluene | SVOA | 66 | U | 66 | 67 | U | 67 | 67 | U | 67 | 65 | U | 65 |
| 2,6-Dinitrotoluene | SVOA | 28 | U | 28 | 28 | U | 28 | 28 | U | 28 | 28 | U | 28 |
| 2-Chloronaphthalene | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 9.9 | U | 9.9 |
| 2-Chlorophenol | SVOA | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 |
| 2-Methylnaphthalene | SVOA | 19 | U | 19 | 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 |
| 2-Nitroaniline | SVOA | 50 | U | 50 | 51 | U | 51 | 51 | U | 51 | 50 | U | 50 |
| 2-Nitrophenol | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 9.9 | U | 9.9 |
| 3,3'-Dichlorobenzidine | SVOA | 90 | U | 90 | 91 | U | 91 | 91 | U | 91 | 89 | U | 89 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 33 | U | 33 | 33 | U | 33 | 33 | U | 33 | 33 | U | 33 |
| 3-Nitroaniline | SVOA | 73 | U | 73 | 74 | U | 74 | 74 | U | 74 | 72 | U | 72 |
| 4,6-Dinitro-2-methylphenol | SVOA | 330 | U | 330 | 330 | U | 330 | 330 | U | 330 | 330 | U | 330 |
| 4-Bromophenylphenyl ether | SVOA | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 |
| 4-Chloro-3-methylphenol | SVOA | 66 | U | 66 | 67 | U | 67 | 67 | U | 67 | 65 | U | 65 |
| 4-Chloroaniline | SVOA | 82 | U | 82 | 83 | U | 83 | 83 | U | 83 | 81 | U | 81 |
| 4-Chlorophenylphenyl ether | SVOA | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 |
| 4-Nitroaniline | SVOA | 73 | U | 73 | 74 | U | 74 | 74 | U | 74 | 72 | U | 72 |
| 4-Nitrophenol | SVOA | 97 | U | 97 | 98 | U | 98 | 98 | U | 98 | 96 | U | 96 |
| Acenaphthene | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 |
| Acenaphthylene | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 |
| Anthracene | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 |
| Benzo(a)anthracene | SVOA | 47 | J | 20 | 27 | J | 20 | 20 | U | 20 | 20 | U | 20 |
| Benzo(a)pyrene | SVOA | 35 | J | 20 | 23 | J | 20 | 20 | U | 20 | 20 | U | 20 |
| Benzo(b)fluoranthene | SVOA | 51 | J | 26 | 27 | U | 27 | 27 | U | 27 | 26 | U | 26 |
| Benzo(ghi)perylene | SVOA | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 |
| Benzo(k)fluoranthene | SVOA | 40 | U | 40 | 41 | U | 41 | 41 | U | 41 | 40 | U | 40 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 23 | U | 23 | 23 | U | 23 | 23 | U | 23 | 23 | U | 23 |
| Bis(2-Chloroethoxy)methane | SVOA | 23 | U | 23 | 23 | U | 23 | 23 | U | 23 | 23 | U | 23 |
| Bis(2-chloroethyl) ether | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 16 | U | 16 |
| Bis(2-ethylhexyl) phthalate | SVOA | 46 | U | 46 | 47 | U | 47 | 47 | U | 47 | 46 | U | 46 |
| Butylbenzylphthalate | SVOA | 43 | U | 43 | 44 | U | 44 | 44 | U | 44 | 43 | U | 43 |
| Carbazole | SVOA | 36 | U | 36 | 37 | U | 37 | 37 | U | 37 | 36 | U | 36 |
| Chrysene | SVOA | 49 | J | 27 | 34 | J | 27 | 27 | U | 27 | 27 | U | 27 |
| Dibenz[a,h]anthracene | SVOA | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 |
| Dibenzofuran | SVOA | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 |
| Diethyl phthalate | SVOA | 26 | U | 26 | 26 | U | 26 | 26 | U | 26 | 26 | U | 26 |
| Dimethyl phthalate | SVOA | 23 | U | 23 | 23 | U | 23 | 23 | U | 23 | 23 | U | 23 |
| Di-n-butylphthalate | SVOA | 29 | U | 29 | 29 | U | 29 | 29 | U | 29 | 29 | U | 29 |
| Di-n-octylphthalate | SVOA | 14 | U | 14 | 15 | U | 15 | 15 | U | 15 | 14 | U | 14 |
| Fluoranthene | SVOA | 77 | J | 36 | 46 | J | 37 | 37 | U | 37 | 36 | U | 36 |
| Fluorene | SVOA | 18 | U | 18 | 18 | U | 18 | 18 | U | 18 | 18 | U | 18 |
| Hexachlorobenzene | SVOA | 29 | U | 29 | 29 | U | 29 | 29 | U | 29 | 29 | U | 29 |
| Hexachlorobutadiene | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 9.9 | U | 9.9 |
| Hexachlorocyclopentadiene | SVOA | 50 | U | 50 | 51 | U | 51 | 51 | U | 51 | 50 | U | 50 |
| Hexachloroethane | SVOA | 21 | U | 21 | 22 | U | 22 | 22 | U | 22 | 21 | U | 21 |
| Indeno(1,2,3-cd)pyrene | SVOA | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 |
| Isophorone | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 |
| Naphthalene | SVOA | 31 | U | 31 | 31 | U | 31 | 31 | U | 31 | 31 | U | 31 |
| Nitrobenzene | SVOA | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 |
| N-Nitroso-di-n-dipropylamine | SVOA | 31 | U | 31 | 31 | U | 31 | 31 | U | 31 | 31 | U | 31 |
| N-Nitrosodiphenylamine | SVOA | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 |
| Pentachlorophenol | SVOA | 330 | U | 330 | 330 | U | 330 | 330 | U | 330 | 330 | U | 330 |
| Phenanthrene | SVOA | 31 | J | 17 | 31 | J | 17 | 18 | J | 17 | 17 | U | 17 |
| Phenol | SVOA | 18 | U | 18 | 18 | U | 18 | 18 | U | 18 | 18 | U | 18 |
| Pyrene | SVOA | 72 | J | 12 | 58 | J | 12 | 16 | J | 12 | 23 | J | 12 |

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| Attachment | 1 | Sheet No. | 51 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1V261, OVB-7 | | | J1V262, OVB-8 | | | J1V264, OVB-10 | | | J1V265, OVB-11 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/10/14 | | | 12/10/14 | | | 12/10/14 | | | 12/10/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 28 | U | 28 | 27 | U | 27 | 28 | U | 28 | 29 | U | 29 |
| 1,2-Dichlorobenzene | SVOA | 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 | 13 | U | 13 |
| 1,4-Dichlorobenzene | SVOA | 14 | U | 14 | 13 | U | 13 | 14 | U | 14 | 14 | U | 14 |
| 2,4,5-Trichlorophenol | SVOA | 10 | U | 10 | 9.8 | U | 9.8 | 10 | U | 10 | 10 | U | 10 |
| 2,4,6-Trichlorophenol | SVOA | 10 | U | 10 | 9.8 | U | 9.8 | 10 | U | 10 | 10 | U | 10 |
| 2,4-Dichlorophenol | SVOA | 10 | U | 10 | 9.8 | U | 9.8 | 10 | U | 10 | 10 | U | 10 |
| 2,4-Dimethylphenol | SVOA | 67 | U | 67 | 65 | U | 65 | 67 | U | 67 | 69 | U | 69 |
| 2,4-Dinitrophenol | SVOA | 340 | U | 340 | 330 | U | 330 | 340 | U | 340 | 350 | U | 350 |
| 2,4-Dinitrotoluene | SVOA | 67 | U | 67 | 65 | U | 65 | 67 | U | 67 | 69 | U | 69 |
| 2,6-Dinitrotoluene | SVOA | 28 | U | 28 | 27 | U | 27 | 28 | U | 28 | 29 | U | 29 |
| 2-Chloronaphthalene | SVOA | 10 | U | 10 | 9.8 | U | 9.8 | 10 | U | 10 | 10 | U | 10 |
| 2-Chlorophenol | SVOA | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 | 22 | U | 22 |
| 2-Methylnaphthalene | SVOA | 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 | 14 | U | 14 |
| 2-Nitroaniline | SVOA | 51 | U | 51 | 49 | U | 49 | 51 | U | 51 | 52 | U | 52 |
| 2-Nitrophenol | SVOA | 10 | U | 10 | 9.8 | U | 9.8 | 10 | U | 10 | 10 | U | 10 |
| 3,3'-Dichlorobenzidine | SVOA | 92 | U | 92 | 88 | U | 88 | 91 | U | 91 | 94 | U | 94 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 34 | U | 34 | 32 | U | 32 | 33 | U | 33 | 35 | U | 35 |
| 3-Nitroaniline | SVOA | 74 | U | 74 | 71 | U | 71 | 74 | U | 74 | 76 | U | 76 |
| 4,6-Dinitro-2-methylphenol | SVOA | 340 | U | 340 | 320 | U | 320 | 330 | U | 330 | 350 | U | 350 |
| 4-Bromophenylphenyl ether | SVOA | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 | 20 | U | 20 |
| 4-Chloro-3-methylphenol | SVOA | 67 | U | 67 | 65 | U | 65 | 67 | U | 67 | 69 | U | 69 |
| 4-Chloroaniline | SVOA | 83 | U | 83 | 80 | U | 80 | 83 | U | 83 | 86 | U | 86 |
| 4-Chlorophenylphenyl ether | SVOA | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 | 22 | U | 22 |
| 4-Nitroaniline | SVOA | 74 | U | 74 | 71 | U | 71 | 74 | U | 74 | 76 | U | 76 |
| 4-Nitrophenol | SVOA | 99 | U | 99 | 95 | U | 95 | 98 | U | 98 | 100 | U | 100 |
| Acenaphthene | SVOA | 10 | U | 10 | 10 | U | 10 | 10 | U | 10 | 11 | U | 11 |
| Acenaphthylene | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 18 | U | 18 |
| Anthracene | SVOA | 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 | 21 | U | 21 |
| Benzo(a)pyrene | SVOA | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 | 21 | U | 21 |
| Benzo(b)fluoranthene | SVOA | 27 | U | 27 | 26 | U | 26 | 27 | U | 27 | 27 | U | 27 |
| Benzo(ghi)perylene | SVOA | 16 | U | 16 | 16 | U | 16 | 16 | U | 16 | 17 | U | 17 |
| Benzo(k)fluoranthene | SVOA | 41 | U | 41 | 39 | U | 39 | 41 | U | 41 | 42 | U | 42 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 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 | 24 | U | 24 |
| 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 | 45 | U | 45 | 47 | U | 47 | 48 | U | 48 |
| Butylbenzylphthalate | SVOA | 44 | U | 44 | 42 | U | 42 | 44 | U | 44 | 45 | U | 45 |
| Carbazole | SVOA | 37 | U | 37 | 35 | U | 35 | 37 | U | 37 | 38 | U | 38 |
| Chrysene | SVOA | 27 | U | 27 | 26 | U | 26 | 27 | U | 27 | 28 | U | 28 |
| Dibenz[a,h]anthracene | SVOA | 19 | U | 19 | 19 | U | 19 | 19 | U | 19 | 20 | U | 20 |
| Dibenzofuran | SVOA | 20 | U | 20 | 20 | U | 20 | 20 | U | 20 | 21 | U | 21 |
| Diethyl phthalate | SVOA | 26 | U | 26 | 25 | U | 25 | 26 | U | 26 | 27 | U | 27 |
| Dimethyl phthalate | SVOA | 23 | U | 23 | 23 | U | 23 | 23 | U | 23 | 24 | U | 24 |
| Di-n-butylphthalate | SVOA | 29 | U | 29 | 28 | U | 28 | 29 | U | 29 | 30 | U | 30 |
| Di-n-octylphthalate | SVOA | 15 | U | 15 | 14 | U | 14 | 15 | U | 15 | 15 | U | 15 |
| Fluoranthene | SVOA | 37 | U | 37 | 35 | U | 35 | 37 | U | 37 | 38 | U | 38 |
| Fluorene | SVOA | 18 | U | 18 | 18 | U | 18 | 18 | U | 18 | 19 | U | 19 |
| Hexachlorobenzene | SVOA | 29 | U | 29 | 28 | U | 28 | 29 | U | 29 | 30 | U | 30 |
| Hexachlorobutadiene | SVOA | 10 | U | 10 | 9.8 | U | 9.8 | 10 | U | 10 | 10 | U | 10 |
| Hexachlorocyclopentadiene | SVOA | 51 | U | 51 | 49 | U | 49 | 51 | U | 51 | 52 | U | 52 |
| Hexachloroethane | SVOA | 22 | U | 22 | 21 | U | 21 | 22 | U | 22 | 22 | U | 22 |
| Indeno(1,2,3-cd)pyrene | SVOA | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 | 23 | U | 23 |
| Isophorone | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 18 | U | 18 |
| Naphthalene | SVOA | 32 | U | 32 | 30 | U | 30 | 31 | U | 31 | 32 | U | 32 |
| Nitrobenzene | SVOA | 22 | U | 22 | 22 | U | 22 | 22 | U | 22 | 23 | U | 23 |
| N-Nitroso-di-n-dipropylamine | SVOA | 32 | U | 32 | 30 | U | 30 | 31 | U | 31 | 32 | U | 32 |
| N-Nitrosodiphenylamine | SVOA | 21 | U | 21 | 21 | U | 21 | 21 | U | 21 | 22 | U | 22 |
| Pentachlorophenol | SVOA | 340 | U | 340 | 320 | U | 320 | 330 | U | 330 | 350 | U | 350 |
| Phenanthrene | SVOA | 17 | U | 17 | 17 | U | 17 | 17 | U | 17 | 18 | U | 18 |
| Phenol | SVOA | 18 | U | 18 | 18 | U | 18 | 18 | U | 18 | 19 | U | 19 |
| Pyrene | SVOA | 13 | J | 12 | 12 | U | 12 | 12 | U | 12 | 13 | U | 13 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 52 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1V4N2, OVB-12[a] | | | J1V263, OVB-9 | | | J1V267, Duplicate of J1V263 | | | J1V266, OVB-12 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 02/26/15 | | | 12/10/14 | | | 12/10/14 | | | 12/10/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 29 | U | 29 | 30 | U | 30 | 300 | UD | 300 | 290 | UD | 290 |
| 1,2-Dichlorobenzene | SVOA | 23 | U | 23 | 24 | U | 24 | 240 | UD | 240 | 230 | UD | 230 |
| 1,3-Dichlorobenzene | SVOA | 12 | U | 12 | 13 | U | 13 | 130 | UD | 130 | 130 | UD | 130 |
| 1,4-Dichlorobenzene | SVOA | 14 | U | 14 | 15 | U | 15 | 150 | UD | 150 | 140 | UD | 140 |
| 2,4,5-Trichlorophenol | SVOA | 10 | U | 10 | 11 | U | 11 | 110 | UD | 110 | 100 | UD | 100 |
| 2,4,6-Trichlorophenol | SVOA | 10 | U | 10 | 11 | U | 11 | 110 | UD | 110 | 100 | UD | 100 |
| 2,4-Dichlorophenol | SVOA | 10 | U | 10 | 11 | U | 11 | 110 | UD | 110 | 100 | UD | 100 |
| 2,4-Dimethylphenol | SVOA | 68 | U | 68 | 72 | U | 72 | 710 | UD | 710 | 690 | UD | 690 |
| 2,4-Dinitrophenol | SVOA | 340 | U | 340 | 360 | U | 360 | 3600 | UD | 3600 | 3500 | UD | 3500 |
| 2,4-Dinitrotoluene | SVOA | 68 | U | 68 | 72 | U | 72 | 710 | UD | 710 | 690 | UD | 690 |
| 2,6-Dinitrotoluene | SVOA | 29 | U | 29 | 30 | U | 30 | 300 | UD | 300 | 290 | UD | 290 |
| 2-Chloronaphthalene | SVOA | 10 | U | 10 | 11 | U | 11 | 110 | UD | 110 | 100 | UD | 100 |
| 2-Chlorophenol | SVOA | 22 | U | 22 | 23 | U | 23 | 230 | UD | 230 | 220 | UD | 220 |
| 2-Methylnaphthalene | SVOA | 19 | U | 19 | 21 | U | 21 | 200 | UD | 200 | 2800 | JD | 200 |
| 2-Methylphenol (cresol, o-) | SVOA | 13 | U | 13 | 14 | U | 14 | 140 | UD | 140 | 140 | UD | 140 |
| 2-Nitroaniline | SVOA | 51 | U | 51 | 54 | U | 54 | 540 | UD | 540 | 520 | UD | 520 |
| 2-Nitrophenol | SVOA | 10 | U | 10 | 11 | U | 11 | 110 | UD | 110 | 100 | UD | 100 |
| 3,3'-Dichlorobenzidine | SVOA | 92 | U | 92 | 98 | U | 98 | 970 | UD | 970 | 940 | UD | 940 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 34 | U | 34 | 36 | U | 36 | 360 | UD | 360 | 350 | UD | 350 |
| 3-Nitroaniline | SVOA | 75 | U | 75 | 79 | U | 79 | 790 | UD | 790 | 770 | UD | 770 |
| 4,6-Dinitro-2-methylphenol | SVOA | 340 | U | 340 | 360 | U | 360 | 3600 | UD | 3600 | 3500 | UD | 3500 |
| 4-Bromophenylphenyl ether | SVOA | 19 | U | 19 | 21 | U | 21 | 200 | UD | 200 | 200 | UD | 200 |
| 4-Chloro-3-methylphenol | SVOA | 68 | U | 68 | 72 | U | 72 | 710 | UD | 710 | 690 | UD | 690 |
| 4-Chloroaniline | SVOA | 84 | U | 84 | 89 | U | 89 | 880 | UD | 880 | 860 | UD | 860 |
| 4-Chlorophenylphenyl ether | SVOA | 22 | U | 22 | 23 | U | 23 | 230 | UD | 230 | 220 | UD | 220 |
| 4-Nitroaniline | SVOA | 74 | U | 74 | 79 | U | 79 | 780 | UD | 780 | 760 | UD | 760 |
| 4-Nitrophenol | SVOA | 100 | U | 100 | 110 | U | 110 | 1000 | UD | 1000 | 1000 | UD | 1000 |
| Acenaphthene | SVOA | 11 | U | 11 | 11 | U | 11 | 750 | JD | 110 | 10000 | D | 110 |
| Acenaphthylene | SVOA | 17 | U | 17 | 19 | U | 19 | 180 | UD | 180 | 180 | UD | 180 |
| Anthracene | SVOA | 17 | U | 17 | 19 | U | 19 | 1900 | JD | 180 | 21000 | D | 180 |
| Benzo(a)anthracene | SVOA | 37 | J | 21 | 22 | J | 22 | 3800 | D | 220 | 29000 | D | 210 |
| Benzo(a)pyrene | SVOA | 30 | J | 21 | 22 | U | 22 | 3300 | JD | 220 | 26000 | D | 210 |
| Benzo(b)fluoranthene | SVOA | 41 | JX | 27 | 29 | U | 29 | 4600 | D | 280 | 44000 | XD | 270 |
| Benzo(ghi)perylene | SVOA | 16 | U | 16 | 17 | U | 17 | 2000 | JD | 170 | 14000 | D | 170 |
| Benzo(k)fluoranthene | SVOA | 41 | UX | 41 | 44 | U | 44 | 1400 | JD | 430 | 420 | UXD | 420 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 24 | U | 24 | 25 | U | 25 | 250 | UD | 250 | 240 | UD | 240 |
| Bis(2-Chloroethoxy)methane | SVOA | 24 | U | 24 | 25 | U | 25 | 250 | UD | 250 | 240 | UD | 240 |
| Bis(2-chloroethyl) ether | SVOA | 17 | U | 17 | 18 | U | 18 | 180 | UD | 180 | 170 | UD | 170 |
| Bis(2-ethylhexyl) phthalate | SVOA | 47 | U | 47 | 50 | U | 50 | 500 | UD | 500 | 480 | UD | 480 |
| Butylbenzylphthalate | SVOA | 44 | U | 44 | 47 | U | 47 | 460 | UD | 460 | 450 | UD | 450 |
| Carbazole | SVOA | 37 | U | 37 | 39 | U | 39 | 860 | JD | 390 | 11000 | D | 380 |
| Chrysene | SVOA | 34 | J | 28 | 29 | U | 29 | 4000 | D | 290 | 28000 | D | 280 |
| Dibenz[a,h]anthracene | SVOA | 19 | U | 19 | 21 | U | 21 | 200 | UD | 200 | 4000 | D | 200 |
| Dibenzofuran | SVOA | 21 | U | 21 | 22 | U | 22 | 450 | JD | 220 | 7000 | D | 210 |
| Diethyl phthalate | SVOA | 27 | U | 27 | 28 | U | 28 | 280 | UD | 280 | 270 | UD | 270 |
| Dimethyl phthalate | SVOA | 24 | U | 24 | 25 | U | 25 | 250 | UD | 250 | 240 | UD | 240 |
| Di-n-butylphthalate | SVOA | 30 | U | 30 | 32 | U | 32 | 310 | UD | 310 | 300 | UD | 300 |
| Di-n-octylphthalate | SVOA | 15 | UX | 15 | 16 | U | 16 | 160 | UD | 160 | 150 | UD | 150 |
| Fluoranthene | SVOA | 69 | J | 37 | 39 | U | 39 | 8300 | D | 390 | 62000 | D | 380 |
| Fluorene | SVOA | 18 | U | 18 | 20 | U | 20 | 740 | JD | 190 | 11000 | D | 190 |
| Hexachlorobenzene | SVOA | 30 | U | 30 | 32 | U | 32 | 310 | UD | 310 | 300 | UD | 300 |
| Hexachlorobutadiene | SVOA | 10 | U | 10 | 11 | U | 11 | 110 | UD | 110 | 100 | UD | 100 |
| Hexachlorocyclopentadiene | SVOA | 51 | U | 51 | 54 | U | 54 | 540 | UD | 540 | 520 | UD | 520 |
| Hexachloroethane | SVOA | 22 | U | 22 | 23 | U | 23 | 230 | UD | 230 | 220 | UD | 220 |
| Indeno(1,2,3-cd)pyrene | SVOA | 23 | U | 23 | 24 | U | 24 | 2100 | JD | 240 | 17000 | D | 230 |
| Isophorone | SVOA | 17 | U | 17 | 19 | U | 19 | 180 | UD | 180 | 180 | UD | 180 |
| Naphthalene | SVOA | 32 | U | 32 | 34 | U | 34 | 340 | JD | 330 | 11000 | D | 330 |
| Nitrobenzene | SVOA | 23 | U | 23 | 24 | U | 24 | 240 | UD | 240 | 230 | UD | 230 |
| N-Nitroso-di-n-dipropylamine | SVOA | 32 | U | 32 | 34 | U | 34 | 330 | UD | 330 | 330 | UD | 330 |
| N-Nitrosodiphenylamine | SVOA | 22 | U | 22 | 23 | U | 23 | 230 | UD | 230 | 220 | UD | 220 |
| Pentachlorophenol | SVOA | 340 | UX | 340 | 360 | U | 360 | 3600 | UD | 3600 | 3500 | UD | 3500 |
| Phenanthrene | SVOA | 46 | J | 17 | 21 | J | 19 | 6000 | D | 180 | 61000 | D | 180 |
| Phenol | SVOA | 18 | U | 18 | 20 | U | 20 | 190 | UD | 190 | 190 | UD | 190 |
| Pyrene | SVOA | 61 | J | 12 | 29 | J | 13 | 6900 | D | 130 | 51000 | D | 130 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 53 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1V281, FS-1 | | | J1V282, FS-2 | | | J1V283, FS-3 | | | J1V284, FS-4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12/15/14 | | | 12/15/14 | | | 12/15/14 | | | 12/15/14 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 30 | U | 30 | 28 | U | 28 | 29 | U | 29 | 29 | U | 29 |
| 1,2-Dichlorobenzene | SVOA | 24 | U | 24 | 22 | U | 22 | 23 | U | 23 | 23 | U | 23 |
| 1,3-Dichlorobenzene | SVOA | 13 | U | 13 | 12 | U | 12 | 13 | U | 13 | 12 | U | 12 |
| 1,4-Dichlorobenzene | SVOA | 15 | U | 15 | 13 | U | 13 | 14 | U | 14 | 14 | U | 14 |
| 2,4,5-Trichlorophenol | SVOA | 11 | U | 11 | 9.9 | U | 9.9 | 10 | U | 10 | 10 | U | 10 |
| 2,4,6-Trichlorophenol | SVOA | 11 | U | 11 | 9.9 | U | 9.9 | 10 | U | 10 | 10 | U | 10 |
| 2,4-Dichlorophenol | SVOA | 11 | U | 11 | 9.9 | U | 9.9 | 10 | U | 10 | 10 | U | 10 |
| 2,4-Dimethylphenol | SVOA | 72 | U | 72 | 65 | U | 65 | 69 | U | 69 | 68 | U | 68 |
| 2,4-Dinitrophenol | SVOA | 360 | U | 360 | 330 | U | 330 | 350 | U | 350 | 340 | U | 340 |
| 2,4-Dinitrotoluene | SVOA | 72 | U | 72 | 65 | U | 65 | 69 | U | 69 | 68 | U | 68 |
| 2,6-Dinitrotoluene | SVOA | 30 | U | 30 | 28 | U | 28 | 29 | U | 29 | 29 | U | 29 |
| 2-Chloronaphthalene | SVOA | 11 | U | 11 | 9.9 | U | 9.9 | 10 | U | 10 | 10 | U | 10 |
| 2-Chlorophenol | SVOA | 23 | U | 23 | 21 | U | 21 | 22 | U | 22 | 22 | U | 22 |
| 2-Methylnaphthalene | SVOA | 21 | U | 21 | 19 | U | 19 | 20 | U | 20 | 20 | U | 20 |
| 2-Methylphenol (cresol, o-) | SVOA | 14 | U | 14 | 13 | U | 13 | 14 | U | 14 | 13 | U | 13 |
| 2-Nitroaniline | SVOA | 54 | U | 54 | 49 | U | 49 | 52 | U | 52 | 51 | U | 51 |
| 2-Nitrophenol | SVOA | 11 | U | 11 | 9.9 | U | 9.9 | 10 | U | 10 | 10 | U | 10 |
| 3,3'-Dichlorobenzidine | SVOA | 98 | U | 98 | 89 | U | 89 | 94 | U | 94 | 93 | U | 93 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 36 | U | 36 | 33 | U | 33 | 34 | U | 34 | 34 | U | 34 |
| 3-Nitroaniline | SVOA | 79 | U | 79 | 72 | U | 72 | 76 | U | 76 | 75 | U | 75 |
| 4,6-Dinitro-2-methylphenol | SVOA | 360 | U | 360 | 330 | U | 330 | 340 | U | 340 | 340 | U | 340 |
| 4-Bromophenylphenyl ether | SVOA | 21 | U | 21 | 19 | U | 19 | 20 | U | 20 | 20 | U | 20 |
| 4-Chloro-3-methylphenol | SVOA | 72 | U | 72 | 65 | U | 65 | 69 | U | 69 | 68 | U | 68 |
| 4-Chloroaniline | SVOA | 89 | UJ | 89 | 81 | UJ | 81 | 85 | UJ | 85 | 84 | UJ | 84 |
| 4-Chlorophenylphenyl ether | SVOA | 23 | U | 23 | 21 | U | 21 | 22 | U | 22 | 22 | U | 22 |
| 4-Nitroaniline | SVOA | 79 | U | 79 | 71 | U | 71 | 76 | U | 76 | 75 | U | 75 |
| 4-Nitrophenol | SVOA | 110 | U | 110 | 96 | U | 96 | 100 | U | 100 | 100 | U | 100 |
| Acenaphthene | SVOA | 11 | U | 11 | 10 | U | 10 | 11 | U | 11 | 11 | U | 11 |
| Acenaphthylene | SVOA | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 | 17 | U | 17 |
| Anthracene | SVOA | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 | 17 | U | 17 |
| Benzo(a)anthracene | SVOA | 22 | U | 22 | 20 | U | 20 | 44 | J | 21 | 21 | U | 21 |
| Benzo(a)pyrene | SVOA | 22 | U | 22 | 20 | U | 20 | 36 | J | 21 | 21 | U | 21 |
| Benzo(b)fluoranthene | SVOA | 28 | U | 28 | 26 | U | 26 | 65 | JX | 27 | 27 | U | 27 |
| Benzo(ghi)perylene | SVOA | 17 | U | 17 | 16 | U | 16 | 17 | U | 17 | 16 | U | 16 |
| Benzo(k)fluoranthene | SVOA | 43 | U | 43 | 39 | U | 39 | 42 | UX | 42 | 41 | U | 41 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 25 | U | 25 | 23 | U | 23 | 24 | U | 24 | 24 | U | 24 |
| Bis(2-Chloroethoxy)methane | SVOA | 25 | U | 25 | 23 | U | 23 | 24 | U | 24 | 24 | U | 24 |
| Bis(2-chloroethyl) ether | SVOA | 18 | U | 18 | 16 | U | 16 | 17 | U | 17 | 17 | U | 17 |
| Bis(2-ethylhexyl) phthalate | SVOA | 50 | U | 50 | 45 | U | 45 | 48 | U | 48 | 47 | U | 47 |
| Butylbenzylphthalate | SVOA | 47 | U | 47 | 42 | U | 42 | 45 | U | 45 | 44 | U | 44 |
| Carbazole | SVOA | 39 | U | 39 | 35 | U | 35 | 38 | U | 38 | 37 | U | 37 |
| Chrysene | SVOA | 29 | U | 29 | 27 | U | 27 | 40 | J | 28 | 28 | U | 28 |
| Dibenz[a,h]anthracene | SVOA | 21 | U | 21 | 19 | U | 19 | 20 | U | 20 | 20 | U | 20 |
| Dibenzofuran | SVOA | 22 | U | 22 | 20 | U | 20 | 21 | U | 21 | 21 | U | 21 |
| Diethyl phthalate | SVOA | 28 | U | 28 | 26 | U | 26 | 27 | U | 27 | 27 | U | 27 |
| Dimethyl phthalate | SVOA | 25 | U | 25 | 23 | U | 23 | 24 | U | 24 | 24 | U | 24 |
| Di-n-butylphthalate | SVOA | 31 | U | 31 | 29 | U | 29 | 30 | U | 30 | 30 | U | 30 |
| Di-n-octylphthalate | SVOA | 16 | U | 16 | 14 | U | 14 | 15 | U | 15 | 15 | U | 15 |
| Fluoranthene | SVOA | 39 | U | 39 | 35 | U | 35 | 81 | J | 38 | 37 | U | 37 |
| Fluorene | SVOA | 20 | U | 20 | 18 | U | 18 | 19 | U | 19 | 19 | U | 19 |
| Hexachlorobenzene | SVOA | 31 | U | 31 | 29 | U | 29 | 30 | U | 30 | 30 | U | 30 |
| Hexachlorobutadiene | SVOA | 11 | U | 11 | 9.9 | U | 9.9 | 10 | U | 10 | 10 | U | 10 |
| Hexachlorocyclopentadiene | SVOA | 54 | U | 54 | 49 | U | 49 | 52 | U | 52 | 51 | U | 51 |
| Hexachloroethane | SVOA | 23 | U | 23 | 21 | U | 21 | 22 | U | 22 | 22 | U | 22 |
| Indeno(1,2,3-cd)pyrene | SVOA | 24 | U | 24 | 22 | U | 22 | 23 | U | 23 | 23 | U | 23 |
| Isophorone | SVOA | 18 | U | 18 | 17 | U | 17 | 18 | U | 18 | 17 | U | 17 |
| Naphthalene | SVOA | 34 | U | 34 | 31 | U | 31 | 32 | U | 32 | 32 | U | 32 |
| Nitrobenzene | SVOA | 24 | U | 24 | 22 | U | 22 | 23 | U | 23 | 23 | U | 23 |
| N-Nitroso-di-n-dipropylamine | SVOA | 34 | U | 34 | 31 | U | 31 | 32 | U | 32 | 32 | U | 32 |
| N-Nitrosodiphenylamine | SVOA | 23 | U | 23 | 21 | U | 21 | 22 | U | 22 | 22 | U | 22 |
| Pentachlorophenol | SVOA | 360 | U | 360 | 330 | U | 330 | 340 | U | 340 | 340 | U | 340 |
| Phenanthrene | SVOA | 18 | U | 18 | 17 | U | 17 | 47 | J | 18 | 17 | U | 17 |
| Phenol | SVOA | 20 | U | 20 | 18 | U | 18 | 19 | U | 19 | 19 | U | 19 |
| Pyrene | SVOA | 13 | U | 13 | 12 | U | 12 | 68 | J | 13 | 12 | U | 12 |

| | | | |
|---|---|---|---|
| Attachment | 1 | Sheet No. | 54 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1TF83, RC-1 | | | J1TF82, RC-2 | | | J1T5W6, RC-3 | | | J1V4N4, Equipment blank 2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 02/26/14 | | | 02/26/14 | | | 11/18/13 | | | 02/26/15 | | |
| | | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 27 | U | 27 | 30 | U | 30 | 29 | U | 29 | 28 | U | 28 |
| 1,2-Dichlorobenzene | SVOA | 21 | U | 21 | 24 | U | 24 | 23 | U | 23 | 22 | U | 22 |
| 1,3-Dichlorobenzene | SVOA | 12 | U | 12 | 13 | U | 13 | 12 | U | 12 | 12 | U | 12 |
| 1,4-Dichlorobenzene | SVOA | 13 | U | 13 | 15 | U | 15 | 14 | U | 14 | 14 | U | 14 |
| 2,4,5-Trichlorophenol | SVOA | 9.8 | U | 9.8 | 11 | U | 11 | 10 | U | 10 | 9.9 | U | 9.9 |
| 2,4,6-Trichlorophenol | SVOA | 9.8 | U | 9.8 | 11 | U | 11 | 10 | U | 10 | 9.9 | U | 9.9 |
| 2,4-Dichlorophenol | SVOA | 9.8 | U | 9.8 | 11 | U | 11 | 10 | U | 10 | 9.9 | U | 9.9 |
| 2,4-Dimethylphenol | SVOA | 64 | U | 64 | 72 | U | 72 | 68 | U | 68 | 66 | U | 66 |
| 2,4-Dinitrophenol | SVOA | 330 | U | 330 | 360 | U | 360 | 350 | U | 350 | 330 | U | 330 |
| 2,4-Dinitrotoluene | SVOA | 64 | U | 64 | 72 | U | 72 | 68 | U | 68 | 66 | U | 66 |
| 2,6-Dinitrotoluene | SVOA | 27 | U | 27 | 30 | U | 30 | 29 | U | 29 | 28 | U | 28 |
| 2-Chloronaphthalene | SVOA | 9.8 | U | 9.8 | 11 | U | 11 | 10 | U | 10 | 9.9 | U | 9.9 |
| 2-Chlorophenol | SVOA | 21 | U | 21 | 23 | U | 23 | 22 | U | 22 | 21 | U | 21 |
| 2-Methylnaphthalene | SVOA | 19 | U | 19 | 21 | U | 21 | 20 | U | 20 | 19 | U | 19 |
| 2-Methylphenol (cresol, o-) | SVOA | 13 | U | 13 | 14 | U | 14 | 13 | U | 13 | 13 | U | 13 |
| 2-Nitroaniline | SVOA | 49 | U | 49 | 54 | U | 54 | 52 | U | 52 | 50 | U | 50 |
| 2-Nitrophenol | SVOA | 9.8 | U | 9.8 | 11 | U | 11 | 10 | U | 10 | 9.9 | U | 9.9 |
| 3,3'-Dichlorobenzidine | SVOA | 88 | U | 88 | 98 | U | 98 | 93 | U | 93 | 89 | U | 89 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 32 | U | 32 | 36 | U | 36 | 34 | U | 34 | 33 | U | 33 |
| 3-Nitroaniline | SVOA | 71 | U | 71 | 79 | U | 79 | 76 | U | 76 | 73 | U | 73 |
| 4,6-Dinitro-2-methylphenol | SVOA | 320 | U | 320 | 360 | U | 360 | 340 | U | 340 | 330 | U | 330 |
| 4-Bromophenylphenyl ether | SVOA | 19 | U | 19 | 21 | U | 21 | 20 | U | 20 | 19 | U | 19 |
| 4-Chloro-3-methylphenol | SVOA | 64 | U | 64 | 72 | U | 72 | 68 | U | 68 | 66 | U | 66 |
| 4-Chloroaniline | SVOA | 80 | U | 80 | 89 | U | 89 | 85 | U | 85 | 81 | U | 81 |
| 4-Chlorophenylphenyl ether | SVOA | 21 | U | 21 | 23 | U | 23 | 22 | U | 22 | 21 | U | 21 |
| 4-Nitroaniline | SVOA | 71 | U | 71 | 79 | U | 79 | 75 | U | 75 | 72 | U | 72 |
| 4-Nitrophenol | SVOA | 95 | U | 95 | 110 | U | 110 | 100 | U | 100 | 96 | U | 96 |
| Acenaphthene | SVOA | 10 | U | 10 | 11 | U | 11 | 11 | U | 11 | 10 | U | 10 |
| Acenaphthylene | SVOA | 17 | U | 17 | 19 | U | 19 | 18 | U | 18 | 17 | U | 17 |
| Anthracene | SVOA | 17 | U | 17 | 19 | U | 19 | 18 | U | 18 | 17 | U | 17 |
| Benzo(a)anthracene | SVOA | 20 | U | 20 | 22 | U | 22 | 21 | U | 21 | 20 | U | 20 |
| Benzo(a)pyrene | SVOA | 20 | U | 20 | 22 | U | 22 | 21 | U | 21 | 20 | U | 20 |
| Benzo(b)fluoranthene | SVOA | 26 | U | 26 | 29 | U | 29 | 27 | U | 27 | 26 | U | 26 |
| Benzo(ghi)perylene | SVOA | 16 | U | 16 | 17 | U | 17 | 17 | U | 17 | 16 | U | 16 |
| Benzo(k)fluoranthene | SVOA | 39 | U | 39 | 44 | U | 44 | 41 | U | 41 | 40 | U | 40 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 22 | U | 22 | 25 | U | 25 | 24 | U | 24 | 23 | U | 23 |
| Bis(2-Chloroethoxy)methane | SVOA | 22 | U | 22 | 25 | U | 25 | 24 | U | 24 | 23 | U | 23 |
| Bis(2-chloroethyl) ether | SVOA | 16 | U | 16 | 18 | U | 18 | 17 | U | 17 | 16 | U | 16 |
| Bis(2-ethylhexyl) phthalate | SVOA | 45 | U | 45 | 50 | U | 50 | 48 | U | 48 | 46 | U | 46 |
| Butylbenzylphthalate | SVOA | 42 | U | 42 | 47 | U | 47 | 45 | U | 45 | 43 | U | 43 |
| Carbazole | SVOA | 35 | U | 35 | 39 | U | 39 | 37 | U | 37 | 36 | U | 36 |
| Chrysene | SVOA | 26 | U | 26 | 29 | U | 29 | 28 | U | 28 | 27 | U | 27 |
| Dibenz[a,h]anthracene | SVOA | 19 | U | 19 | 21 | U | 21 | 20 | U | 20 | 19 | U | 19 |
| Dibenzofuran | SVOA | 20 | U | 20 | 22 | U | 22 | 21 | U | 21 | 20 | U | 20 |
| Diethyl phthalate | SVOA | 25 | U | 25 | 28 | U | 28 | 27 | U | 27 | 26 | U | 26 |
| Dimethyl phthalate | SVOA | 22 | U | 22 | 37 | J | 25 | 43 | JB | 24 | 23 | U | 23 |
| Di-n-butylphthalate | SVOA | 28 | U | 28 | 32 | U | 32 | 30 | U | 30 | 29 | U | 29 |
| Di-n-octylphthalate | SVOA | 14 | U | 14 | 16 | U | 16 | 15 | U | 15 | 14 | UX | 14 |
| Fluoranthene | SVOA | 35 | U | 35 | 39 | U | 39 | 37 | U | 37 | 36 | U | 36 |
| Fluorene | SVOA | 18 | U | 18 | 20 | U | 20 | 19 | U | 19 | 18 | U | 18 |
| Hexachlorobenzene | SVOA | 28 | U | 28 | 32 | U | 32 | 30 | U | 30 | 29 | U | 29 |
| Hexachlorobutadiene | SVOA | 9.8 | U | 9.8 | 11 | U | 11 | 10 | U | 10 | 9.9 | U | 9.9 |
| Hexachlorocyclopentadiene | SVOA | 49 | U | 49 | 54 | U | 54 | 52 | UX | 52 | 50 | U | 50 |
| Hexachloroethane | SVOA | 21 | U | 21 | 23 | U | 23 | 22 | U | 22 | 21 | U | 21 |
| Indeno(1,2,3-cd)pyrene | SVOA | 21 | U | 21 | 24 | U | 24 | 23 | U | 23 | 22 | U | 22 |
| Isophorone | SVOA | 17 | U | 17 | 19 | U | 19 | 18 | U | 18 | 17 | U | 17 |
| Naphthalene | SVOA | 30 | U | 30 | 34 | U | 34 | 32 | U | 32 | 31 | U | 31 |
| Nitrobenzene | SVOA | 21 | U | 21 | 24 | U | 24 | 23 | U | 23 | 22 | U | 22 |
| N-Nitroso-di-n-dipropylamine | SVOA | 30 | U | 30 | 34 | U | 34 | 32 | U | 32 | 31 | U | 31 |
| N-Nitrosodiphenylamine | SVOA | 21 | U | 21 | 23 | U | 23 | 22 | U | 22 | 21 | U | 21 |
| Pentachlorophenol | SVOA | 320 | U | 320 | 360 | U | 360 | 340 | U | 340 | 330 | UX | 330 |
| Phenanthrene | SVOA | 17 | U | 17 | 19 | U | 19 | 18 | U | 18 | 17 | U | 17 |
| Phenol | SVOA | 18 | U | 18 | 20 | U | 20 | 19 | U | 19 | 18 | U | 18 |
| Pyrene | SVOA | 12 | U | 12 | 17 | J | 13 | 29 | J | 13 | 12 | U | 12 |

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| Attachment | 1 | Sheet No. | 55 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

**Attachment 1. 100-H-28:2 and 100-H-42 Waste Site Verification Sample Results (SVOCs).**

| CONSTITUENT | CLASS | J1V544, Equipment blank 3 | | |
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| | | 03/16/15 | | |
| | | ug/kg | Q | PQL |
| 1,2,4-Trichlorobenzene | SVOA | 28 | U | 28 |
| 1,2-Dichlorobenzene | SVOA | 22 | U | 22 |
| 1,3-Dichlorobenzene | SVOA | 12 | U | 12 |
| 1,4-Dichlorobenzene | SVOA | 13 | U | 13 |
| 2,4,5-Trichlorophenol | SVOA | 9.9 | U | 9.9 |
| 2,4,6-Trichlorophenol | SVOA | 9.9 | U | 9.9 |
| 2,4-Dichlorophenol | SVOA | 9.9 | U | 9.9 |
| 2,4-Dimethylphenol | SVOA | 65 | U | 65 |
| 2,4-Dinitrophenol | SVOA | 330 | U | 330 |
| 2,4-Dinitrotoluene | SVOA | 65 | U | 65 |
| 2,6-Dinitrotoluene | SVOA | 28 | U | 28 |
| 2-Chloronaphthalene | SVOA | 9.9 | U | 9.9 |
| 2-Chlorophenol | SVOA | 21 | U | 21 |
| 2-Methylnaphthalene | SVOA | 19 | U | 19 |
| 2-Methylphenol (cresol, o-) | SVOA | 13 | U | 13 |
| 2-Nitroaniline | SVOA | 50 | U | 50 |
| 2-Nitrophenol | SVOA | 9.9 | U | 9.9 |
| 3,3'-Dichlorobenzidine | SVOA | 89 | U | 89 |
| 3+4 Methylphenol (cresol, m+p) | SVOA | 33 | U | 33 |
| 3-Nitroaniline | SVOA | 72 | U | 72 |
| 4,6-Dinitro-2-methylphenol | SVOA | 330 | U | 330 |
| 4-Bromophenylphenyl ether | SVOA | 19 | U | 19 |
| 4-Chloro-3-methylphenol | SVOA | 65 | U | 65 |
| 4-Chloroaniline | SVOA | 81 | U | 81 |
| 4-Chlorophenylphenyl ether | SVOA | 21 | U | 21 |
| 4-Nitroaniline | SVOA | 72 | U | 72 |
| 4-Nitrophenol | SVOA | 96 | U | 96 |
| Acenaphthene | SVOA | 10 | U | 10 |
| Acenaphthylene | SVOA | 17 | U | 17 |
| Anthracene | SVOA | 17 | U | 17 |
| Benzo(a)anthracene | SVOA | 20 | U | 20 |
| Benzo(a)pyrene | SVOA | 20 | U | 20 |
| Benzo(b)fluoranthene | SVOA | 26 | U | 26 |
| Benzo(ghi)perylene | SVOA | 16 | U | 16 |
| Benzo(k)fluoranthene | SVOA | 40 | U | 40 |
| Bis(2-chloro-1-methylethyl)ether | SVOA | 23 | U | 23 |
| Bis(2-Chloroethoxy)methane | SVOA | 23 | U | 23 |
| Bis(2-chloroethyl) ether | SVOA | 16 | U | 16 |
| Bis(2-ethylhexyl) phthalate | SVOA | 46 | U | 46 |
| Butylbenzylphthalate | SVOA | 43 | U | 43 |
| Carbazole | SVOA | 36 | U | 36 |
| Chrysene | SVOA | 27 | U | 27 |
| Dibenz[a,h]anthracene | SVOA | 19 | U | 19 |
| Dibenzofuran | SVOA | 20 | U | 20 |
| Diethyl phthalate | SVOA | 29 | J | 26 |
| Dimethyl phthalate | SVOA | 23 | U | 23 |
| Di-n-butylphthalate | SVOA | 29 | U | 29 |
| Di-n-octylphthalate | SVOA | 14 | U | 14 |
| Fluoranthene | SVOA | 36 | U | 36 |
| Fluorene | SVOA | 18 | U | 18 |
| Hexachlorobenzene | SVOA | 29 | U | 29 |
| Hexachlorobutadiene | SVOA | 9.9 | U | 9.9 |
| Hexachlorocyclopentadiene | SVOA | 50 | U | 50 |
| Hexachloroethane | SVOA | 21 | U | 21 |
| Indeno(1,2,3-cd)pyrene | SVOA | 22 | U | 22 |
| Isophorone | SVOA | 17 | U | 17 |
| Naphthalene | SVOA | 31 | U | 31 |
| Nitrobenzene | SVOA | 22 | U | 22 |
| N-Nitroso-di-n-dipropylamine | SVOA | 31 | U | 31 |
| N-Nitrosodiphenylamine | SVOA | 21 | U | 21 |
| Pentachlorophenol | SVOA | 330 | UX | 330 |
| Phenanthrene | SVOA | 17 | U | 17 |
| Phenol | SVOA | 18 | U | 18 |
| Pyrene | SVOA | 12 | U | 12 |

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| Attachment | 1 | Sheet No. | 56 of 56 |
| Originator | I. B. Berezovskiy | Date | 5/29/15 |
| Checked | J. D. Skoglie | Job No. | 14655 |
| Calc. No. | 0100H-CA-V0230 | Rev. No. | 0 |

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# CALCULATION COVER SHEET

Project Title: 100-H Area Closure Operations **Job No. 14655**

Area: 100-H

Discipline: Environmental *Calculation No: 0100H-CA-V0231

Subject: 100-H-28:2 and 100-H-42 Waste Sites Direct Contact Hazard Quotient, Carcinogenic Risk, and Sum of Fractions 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<br>Sheets = 6<br>Total = 7 | I. B. Berezovskiy | J. D. Skoglie | R. J. Nielson | S. G. Wilkinson | 7/14/15 |
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## SUMMARY OF REVISION

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

Washington Closure Hanford CALCULATION SHEET

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|---|---|---|---|---|---|---|---|
| Originator: | I. B. Berezovskiy | Date: | 07/13/15 | Calc. No.: | 0100H-CA-V0231 | Rev.: | 0 |
| Project: | 100-H Area Closure Operations | Job No: | 14655 | Checked: | J. D. Skoglie | Date: | 07/13/15 |
| Subject: | 100-H-28:2 and 100-H-42 Waste Sites Direct Contact Hazard Quotient, Carcinogenic Risk, and Sum of Fractions Calculations | | | | | Sheet No. 1 of 6 | |

## PURPOSE:

Provide documentation to support the calculation of the direct contact hazard quotient (HQ) and excess carcinogenic risk for the 100-H-28:2 and 100-H-42 waste sites. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2009b), 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.

This calculation also provides documentation to support the calculation of the sum of fractions evaluation for radionuclide direct exposure risk. Attainment of direct exposure RAGs is demonstrated using the single-radionuclide dose-equivalence lookup values to perform sum of fractions evaluations for comparison of the total radionuclide dose to the RAG of 15 mrem/yr above background. The model used to develop these dose-equivalence lookup values is presented in the 100 Area RDR/RAWP (DOE-RL 2009b).

## GIVEN/REFERENCES:

1) DOE-RL, 2009a, *100 Area Remedial Action Sampling and Analysis Plan*, DOE/RL-96-22, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

2) DOE-RL, 2009b, *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.

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

4) WCH, 2015, *100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations*, 0100H-CA-V0230, Rev. 0, 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 2009b).

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 2009b).

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

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| Originator: | I. B. Berezovskiy | Date: | 07/13/15 | Calc. No.: | 0100H-CA-V0231 | Rev.: | 0 |
| Project: | 100-H Area Closure Operations | Job No: | 14655 | Checked: | J. D. Skoglie | Date: | 07/13/15 |
| Subject: | 100-H-28:2 and 100-H-42 Waste Sites Direct Contact Hazard Quotient, Carcinogenic Risk, and Sum of Fractions Calculations | | | | | Sheet No. | 2 of 6 |

***Summation of Fractions***

The sum-of-fractions compares the maximum or statistical radionuclide cleanup verification results from the 100-H-28:2 and 100-H-42 waste sites to the direct exposure single radionuclide 15 mrem/yr dose-equivalence values and shows the sum-of-fractions evaluation for comparison of the total radionuclide dose to the RAG of 15 mrem/yr above background. The first two columns of the table present the COPCs and the maximum radionuclide activities for the samples. The third column presents the single radionuclide 15 mrem/yr dose-equivalence activities, and the last column presents the individual fractions obtained from the radionuclide activities divided by the dose-equivalence activities, followed by the sum of the fractions and determination of the total waste site dose for comparison to the 15 mrem/yr RAG.

## METHODOLOGY:

The 100-H-28:2 and 100-H-42 waste sites are comprised of four decision units for verification sampling; excavation 1, excavation 2, staging pile area, and overburden. Also collected were seven focused samples. The direct contact hazard quotient and carcinogenic risk calculations for the 100-H-28:2 and 100-H-42 waste sites were conservatively calculated using the greater of the statistical or maximum value for each analyte from all decision units from WCH (2015). Of the contaminants of potential concern (COPCs) for this site, boron, hexavalent chromium, molybdenum, nitrogen in nitrite, detected semivolatile organic compounds (SVOC), the detected polycyclic aromatic hydrocarbons (PAHs), the detected pesticides, and the detected polychlorinated biphenyls (PCBs) require HQ and risk calculations because these analytes were detected and a Washington State or Hanford Site background value is not available. Chromium (total), nitrogen in nitrate, and mercury, require HQ and risk calculations because these analytes were detected above a Washington State or Hanford Site background value. Lead was detected above background; however, lead does not have a reference dose for calculation of a hazard quotient because toxic effects of lead are correlated with blood-lead levels rather than exposure levels or daily intake. Additionally, arsenic was detected above background; however, the arsenic standard is not toxicity based. Although total petroleum hydrocarbons (motor oil [high boiling] + diesel range) were detected and no background value is available, the risk associated with total petroleum hydrocarbons do not contribute to the cumulative toxicity calculation. 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 statistical value for boron is 25.7 mg/kg, divided by the noncarcinogenic RAG value of 7,200 mg/kg (calculated in accordance with the noncarcinogenic toxics effects formula in WAC 173-340-740[3]), is $3.6 \times 10^{-3}$. 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 $2.4 \times 10^{-1}$. 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 $1.0 \times 10^{-6}$. For example, the statistical value for hexavalent

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| Project: | 100-H Area Closure Operations | Job No: | 14655 | Checked: | J. D. Skoglie | Date: | 07/13/15 |
| Subject: | 100-H-28:2 and 100-H-42 Waste Sites Direct Contact Hazard Quotient, Carcinogenic Risk, and Sum of Fractions Calculations | | | | | Sheet No. | 3 of 6 |

chromium is 0.365 mg/kg; divided by 2.1 mg/kg, and multiplied as indicated, is $1.7 \times 10^{-7}$. Comparing this value 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 is obtained by summing the individual values. The excess cancer risk for the carcinogenic constituents detected is $9.0 \times 10^{-7}$. Comparing this value to the requirement of $<1 \times 10^{-5}$, this criterion is met.

***Summation of Fractions***

The sum-of-fractions were calculated for the data set using the greater of the statistical or maximum value for each radionuclide COPC from the 95% upper confidence limit (UCL) calculation (WCH 2015).

Calculations for the 100-H-28:2 and 100-H-42 waste sites were performed using RAGs from the 100 Area RDR/RAWP (DOE/RL 2009b). An example of the sum-of-fractions calculation of COPCs is presented below:

1) To calculate the fraction, the statistical value for carbon-14 (0.0910 pCi/g) is divided by the soil activity equivalent of 8.69 pCi/g equivalent to a 15 mrem/yr dose, resulting in a fraction of 0.0105.

2) The fractions for the remaining COPCs are determined and summed. The sum of these fractions equals 0.0440. The sum of fractions is then multiplied by 15 mrem/yr to determine the total equivalent dose of 0.660 mrem/yr for the 100-H-28:2 and 100-H-42 waste sites. Comparing this value to the dose limit of <15 mrem/yr, the requirement is met.

**RESULTS:**

***Hazard Quotient and Excess Cancer Risk Calculations***

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

Table 1 shows the results of the calculations.

***Summation of Fractions***

As demonstrated by the summation of the fractions, the maximum cumulative dose values contributed by the residual radionuclide populations (0.660 mrem/yr) is predicted to be less than the RAG of 15 mrem/yr above background.

Table 2 shows the results of the sum-of-fraction evaluation for radionuclide direct exposure risk.

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| Project: | 100-H Area Closure Operations | Job No: | 14655 | Checked: | J. D. Skoglie | Date: | 07/13/15 |
| Subject: | 100-H-28:2 and 100-H-42 Waste Sites Direct Contact Hazard Quotient, Carcinogenic Risk, and Sum of Fractions Calculations | | | | | Sheet No. 4 of 6 | |

**Table 1. Direct Contact Hazard Quotient and Excess Cancer Risk Results for the 100-H-28:2 and 100-H-42 Waste Sites (Page 1 of 2).**

| 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*** | | | | | |
| Arsenic [c] | 15.2 | 20 | -- | -- | -- |
| Boron | 25.7 | 7,200 | 3.6E-03 | -- | -- |
| Chromium, total | 21.2 | 80,000 | 2.7E-04 | -- | -- |
| Chromium, hexavalent [d] | 0.365 | 240 | 1.5E-03 | 2.1 | 1.7E-07 |
| Lead [e] | 65.0 | 353 | -- | -- | -- |
| Mercury | 4.9 | 24 | 2.0E-01 | -- | -- |
| Molybdenum | 0.31 | 400 | 7.8E-04 | -- | -- |
| ***Anions*** | | | | | |
| Nitrogen in nitrate | 15.2 | 128,000 | 1.2E-04 | -- | -- |
| Nitrogen in nitrite | 1.5 | 8,000 | 1.9E-04 | -- | -- |
| ***Semivolatiles*** | | | | | |
| Chloronaphthalene; 2- | 0.018 | 6,400 | 2.8E-06 | -- | -- |
| Dichlorobenzene; 1,3- | 0.014 | 2,400 | 5.8E-06 | -- | -- |
| Dichlorobenzene; 1,4- | 0.014 | 1,600 | 8.8E-06 | 41.7 | 3.4E-10 |
| Dimethylphthalate | 0.043 | 80,000 | 5.4E-07 | -- | -- |
| Trichlorophenol; 2,4,5- | 0.016 | 8,000 | 2.0E-06 | -- | -- |
| Trichlorophenol; 2,4,6- | 0.013 | -- | -- | 90.9 | 1.4E-10 |
| ***Polycyclic Aromatic Hydrocarbons*** | | | | | |
| Acenaphthene | 0.027 | 4,800 | 5.6E-06 | -- | -- |
| Anthracene | 0.026 | 24,000 | 1.1E-06 | -- | -- |
| Benzo(a)anthracene | 0.037 | -- | -- | 1.37 | 2.7E-08 |
| Benzo(a)pyrene | 0.047 | -- | -- | 0.137 | 3.4E-07 |
| Benzo(b)fluoranthene | 0.037 | -- | -- | 1.37 | 2.7E-08 |
| Benzo(ghi)perylene [f] | 0.043 | 2,400 | 1.8E-05 | -- | -- |
| Benzo(k)fluoranthene | 0.019 | -- | -- | 13.7 | 1.4E-09 |
| Chrysene | 0.056 | -- | -- | 137 | 4.1E-10 |
| Dibenz(a,h)anthracene | 0.015 | -- | -- | 0.137 | 1.1E-07 |
| Fluoranthene | 0.078 | 3,200 | 2.4E-05 | -- | -- |
| Fluorene | 0.028 | 3,200 | 8.8E-06 | -- | -- |
| Indeno(1,2,3-cd)pyrene | 0.030 | -- | -- | 1.37 | 2.2E-08 |
| Phenanthrene [f] | 0.13 | 24,000 | 5.4E-06 | -- | -- |
| Pyrene | 0.082 | 2,400 | 3.4E-05 | -- | -- |

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| Originator: | I. B. Berezovskiy | Date: | 07/13/15 | Calc. No.: | 0100H-CA-V0231 | Rev.: | 0 |
| Project: | 100-H Area Closure Operations | Job No: | 14655 | Checked: | J. D. Skoglie | Date: | 07/13/15 |
| Subject: | 100-H-28:2 and 100-H-42 Waste Sites Direct Contact Hazard Quotient, Carcinogenic Risk, and Sum of Fractions Calculations | | | | | Sheet No. | 5 of 6 |

**Table 1. Direct Contact Hazard Quotient and Excess Cancer Risk Results for the 100-H-28:2 and 100-H-42 Waste Sites (Page 2 of 2).**

| 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 |
|---|---|---|---|---|---|
| ***Pesticides*** | | | | | |
| DDE, 4,4'- | 0.0050 | -- | -- | 2.94 | 1.7E-09 |
| DDT, 4,4'- | 0.0029 | 40 | 7.3E-05 | 2.94 | 9.9E-10 |
| ***Polychlorinated Biphenyls*** | | | | | |
| Aroclor-1254 | 0.046 | 1.6 | 2.9E-02 | 0.5 | 9.2E-08 |
| Aroclor-1260 | 0.048 | -- | -- | 0.5 | 9.6E-08 |
| ***Total Petroleum Hydrocarbons*** | | | | | |
| TPH - Diesel EXT [g] | 48 | 200 | -- | -- | -- |
| ***Totals*** | | | | | |
| **Cumulative Hazard Quotient:** | | | **2.4E-01** | | |
| **Cumulative Excess Cancer Risk:** | | | | | **9.0E-07** |

Notes:

[a] = From (WCH 2015).

[b] = Value obtained from the 100 Area RDR/RAWP (DOE-RL 2009b) or *Washington Administrative Code* (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.

[c] = 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 RDR/RAWP (DOE-RL 2009b).

[d] = Value for the carcinogen RAG calculated based on the inhalation exposure pathway (WAC) 173-340-750(3), 1996.

[e] = Value for the noncarcinogenic RAG calculated using Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children, EPA/540/R 93/081, Publication No. 9285.7, U.S. Environmental Protection Agency, Washington, D.C.

[f] = Toxicity data for these chemicals are not available. The cleanup levels are based on use of surrogate chemicals.
benzo(g,h,i)perylene surrogate: pyrene
phenanthrene surrogate: anthracene

[g] = The risk associated with total petroleum hydrocarbons do not contribute to the cumulative toxicity calculation.

-- = not applicable

RAG = remedial action goal

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| Originator: | I. B. Berezovskiy | Date: | 07/13/15 | Calc. No.: | 0100H-CA-V0231 | Rev.: | 0 |
| Project: | 100-H Area Closure Operations | Job No: | 14655 | Checked: | J. D. Skoglie | Date: | 07/13/15 |
| Subject: | 100-H-28:2 and 100-H-42 Waste Sites Direct Contact Hazard Quotient, Carcinogenic Risk, and Sum of Fractions Calculations | | | | | Sheet No. | 6 of 6 |

**Table 2. 100-H-28:2 and 100-H-42 Waste Sites Sum of Fractions Prediction of Maximum Radionuclide Dose.**

| COPC | 95% UCL Statistical Values (pCi/g) | Background (pCi/g) [a] | Statistical Value (Background Corrected) (pCi/g) | Soil Activity for 15 mrem/yr Dose (pCi/g) [b] | Fraction |
|---|---|---|---|---|---|
| Carbon-14 | 0.0910 | NA | 0.0910 | 8.69 | 0.0105 |
| Cesium-137 | 0.0844 | 1.1 | 0.0844 | 6.2 | 0.0136 |
| Europium-152 | 0.0574 | NA | 0.0574 | 3.3 | 0.0174 |
| Europium-155 | 0.0365 | 0.054 | 0.0365 | 125 | 0.000292 |
| Nickel-63 | 8.99 | NA | 8.990 | 4,013 | 0.00224 |
| | | | | **Sum of Fractions** | 0.0440 |
| | | | | **Equivalent Dose (mrem/yr)** | 0.660 |

[a] Background is subtracted from all uranium isotopes regardless of the decision unit they were detected in. However, background is subtracted from all other isotopes only if they were detected in the overburden decision unit.

[b] Single radionuclide 15 mrem/yr dose-equivalence values and methodology are presented in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 2009b).

COPC = contaminant of potential concern

## CONCLUSION:

The calculations in Tables 1 and 2 demonstrate that the 100-H-28:2 and 100-H-42 waste sites meet the requirements for the direct contact hazard quotient, carcinogenic (excess cancer) risk, and radionuclide direct exposure risk as identified in the RDR/RAWP (DOE-RL 2009b) and SAP (DOE-RL 2009a). The direct contact hazard quotient, carcinogenic (excess cancer) risk calculations, and the sum-of-fractions evaluation for radionuclide direct exposure risk are for use in the RSVP for the 100-H-28:2 and 100-H-42 waste sites.

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# CALCULATION COVER SHEET

Project Title: 100-H Area Closure Operations **Job No. 14655**

Area: 100-H

Discipline: Environmental *Calculation No: 0100H-CA-V0232

Subject: 100-H-28:2 and 100-H-42 Waste Sites Hazard Quotient and Carcinogenic Risk Calculations 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<br>Summary = 4<br>Total = 5 | J. B. Berezovsky | J. D. Skoglie | R. J. Nielson | S. G. Wilkinson | 7/14/15 |
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Washington Closure Hanford CALCULATION SHEET

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| Originator: | I. B. Berezovskiy | Date: | 7/13/2015 | Calc. No.: | 0100H-CA-V0232 | Rev.: | 0 |
| Project: | 100-H Area Closure Operations | Job No: | 14655 | Checked: | J. D. Skoglie | Date: | 7/13/2015 |
| Subject: | 100-H-28:2 and 100-H-42 Waste Sites Hazard Quotient and Carcinogenic Risk Calculations for Protection of Groundwater | | | | | Sheet No. 1 of 4 | |

## 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-H-28:2 and 100-H-42 waste sites. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2009), 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) BHI, 2005, *100 Area Analogous Sites RESRAD Evaluation*, Calculation No. 0100X-CA-V0050 Rev 0, Bechtel Hanford, Inc., Richland, Washington.

2) 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.

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

4) WCH, 2015, *100-H-28:2 and 100-H-42 Waste Sites Cleanup Verification 95% UCL Calculations*, 0100H-CA-V0230, Rev. 0, 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 (BHI 2005).

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 (BHI 2005).

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

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| Project: | 100-H Area Closure Operations | Job No: | 14655 | Checked: | J. D. Skoglie | Date: | 7/13/2015 |
| Subject: | 100-H-28:2 and 100-H-42 Waste Sites Hazard Quotient and Carcinogenic Risk Calculations for Protection of Groundwater | | | | | Sheet No. 2 of 4 | |

## METHODOLOGY:

The 100-H-28:2 and 100-H-42 waste sites are comprised of four decision units for verification sampling; excavation 1, excavation 2, staging pile area, and overburden pile. Also collected were seven focused samples. This hazard quotient and carcinogenic risk calculations for potential impact to groundwater were conservatively calculated for all decision units using the greater of the statistical or maximum value for each analyte from the 95% UCL calculation (WCH 2015). Based on the generic site RESRAD model (BHI 2005) and a vadose zone of approximately 2.5 m (8.2 ft) thickness, a $K_d$ of 23.5 mL/g or greater is required to show no predicted migration to groundwater in 1,000 years. Of the contaminants of potential concern (COPCs) for this site, boron, hexavalent chromium, molybdenum, acenaphthene, fluorene, detected semivolatile organic compounds (SVOCs), and nitrogen in nitrite are included because no Washington State or Hanford background value has been established and the distribution coefficient ($K_d$) is less than that necessary to show no migration to groundwater in 1,000 years using this model. Nitrogen in nitrate was included because it was detected above a Washington State or Hanford Site background value and the $K_d$ is less than that necessary to show no migration to groundwater in 1,000 years using this model. Additionally, arsenic was detected above background; however, the arsenic standard is not toxicity based, therefore a groundwater HQ is not calculated. All other site nonradionuclide COPCs were not detected, quantified below background levels, or has a $K_d$ greater than or equal to 23.5 mL/g. 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 (mg/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 mg (conversion factor). This is based on the "100 times rule" of WAC 173-340-740(3)(a)(ii)(A) (1996). For example, the statistical value for boron is 25.7 mg/kg, divided by the noncarcinogenic RAG value of 320 mg/kg is $8.0 \times 10^{-2}$. 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-H-28:2 and 100-H-42 waste site is $2.1 \times 10^{-1}$. 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 $1 \times 10^{-6}$. For example the statistical value for 1,4-dichlorobenzene is 0.014 mg/kg, divided by 0.182, and multiplied by $1 \times 10^{-6}$ is $7.7 \times 10^{-8}$. Therefore, the requirement of $<1 \times 10^{-6}$ is met. The cumulative cancer risk is $9.3 \times 10^{-8}$. The criterion for cumulative excess cancer risk for carcinogens of $<1 \times 10^{-5}$ 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

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groundwater 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.

## 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-H-28:2 and 100-H-42 Waste Sites.**

| Contaminants of Potential Concern[a] | Statistical Value[a] (mg/kg) | Noncarcinogen RAG[b] (mg/kg) | Hazard Quotient | Carcinogen RAG[b] (mg/kg) | Carcinogen Risk |
|---|---|---|---|---|---|
| ***Metals*** | | | | | |
| Arsenic[c] | 15.2 | 20 | -- | -- | -- |
| Boron | 25.7 | 320 | 8.0E-02 | -- | -- |
| Chromium, hexavalent | 0.365 | 4.8 | 7.6E-02 | -- | -- |
| Molybdenum | 0.31 | 8 | 3.9E-02 | -- | -- |
| ***Polycyclic Aromatic Hydrocarbones*** | | | | | |
| Acenaphthene | 0.027 | 96 | 2.8E-04 | -- | -- |
| Fluorene | 0.028 | 64 | 4.4E-04 | -- | -- |
| ***Semivolatiles*** | | | | | |
| Dichlorobenzene; 1,3- | 0.014 | 24 | 5.8E-04 | -- | -- |
| Dichlorobenzene; 1,4- | 0.014 | 16 | 8.8E-04 | 0.182 | 7.7E-08 |
| Chloronaphthalene; 2- | 0.018 | 64 | 2.8E-04 | -- | -- |
| Dimethylphthalate | 0.043 | 1,600 | 2.7E-05 | -- | -- |
| Trichlorophenol; 2,4,5- | 0.016 | 80 | 2.0E-04 | -- | -- |
| Trichlorophenol; 2,4,6- | 0.013 | -- | -- | 0.795 | 1.6E-08 |
| ***Anions*** | | | | | |
| Nitrogen in nitrate | 15.2 | 2,560 | 5.9E-03 | -- | -- |
| Nitrogen in nitrite | 1.5 | 160 | 9.4E-03 | -- | -- |
| ***Totals*** | | | | | |
| **Cumulative Hazard Quotient:** | | | **2.1E-01** | | |
| **Cumulative Excess Cancer Risk:** | | | | | **9.3E-08** |

Notes:

[a] = From WCH (2015).

[b] = Value obtained from the Cleanup Levels and Risk Calculations (CLARC) database using Groundwater, Method B, results and the "100 times" model.

[c] = 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 RDR/RAWP (DOE-RL 2009).

-- = not applicable

RAG = remedial action goal

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## CONCLUSION:

This calculation demonstrates that the 100-H-28:2 and 100-H-42 waste sites meet the requirements for the hazard quotient and excess carcinogenic risk for protection of groundwater as identified in the RDR/RAWP (DOE-RL 2009). The hazard quotient and carcinogenic risk calculations for protection of groundwater are for use in the RSVP for these sites.

# 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, 2015b). This DQA was performed in accordance with site-specific data quality objectives found in the *100 Area Remedial Action Sampling and Analysis Plan* (100 Area SAP) (DOE-RL 2009).

A review of the sample design (WCH 2014b), the field logbooks (WCH 2013, 2014a, 2015a), 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 100 Area SAP (DOE-RL 2009) data assurance requirements and the data validation procedures for chemical analysis and radiochemical analysis (BHI 2000a, 2000b) are 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 sample data collected at the 100-H-28:2 and 100-H-42 waste sites were provided by the laboratory in nine sample delivery groups (SDGs): J02094, JP0662, JP0883, JP0884, JP0885, JP0910, JP0911, JP0921, and JP0938. The SDG JP0885 was submitted for third-party validation. Major and minor deficiencies are discussed for the 100-H-28:2 and 100-H-42 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.

## MAJOR DEFICIENCIES

Due to holding time exceedances of greater than twice the limit of 48 hours in the method 9056M ion chromatography (IC) anions analysis, the project has qualified all undetected nitrate, nitrite, and orthophosphate results in SDGs J02094, JP0883, JP0884, JP0910, JP0911, JP0921, and JP0938 as rejected with "R" flags. All detected nitrate, nitrite, and orthophosphate data was qualified as estimated with "J" flags by the project. This result was anticipated; therefore, the U.S. Environmental Protection Agency analytical method 353.2 was also requested to provide acceptable nitrate/nitrite data for decision-making purposes. The estimated and rejected data for nitrate and nitrite do not hinder the evaluation of the 100-H-28:2 and 100-H-42 waste sites. Phosphate is not a regulated chemical under *Washington Administrative Code* (WAC) 173-340, "Model Toxics Control Act - Cleanup."

## MINOR DEFICIENCIES

### SDG J02094

This SDG comprises two focused soil samples (J1TF82 and J1TF83) from the 100-H-28:2 subsite road crossing (RC-1 and RC-2). These samples were analyzed for inductively coupled plasma (ICP) metals, mercury, hexavalent chromium, IC anions, polychlorinated biphenyls (PCBs), semivolatile organic analysis (SVOA), total petroleum hydrocarbons (TPH), and pesticides. Minor deficiencies are as follows.

In the ICP metals analysis, serial dilutions of a digestate indicate physical and chemical interferences are present. The laboratory has qualified the associated data with "X" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the matrix spike (MS) recoveries are out of project acceptance criteria for five analytes (aluminum [830%], antimony [67%], iron [1,424%], manganese [161%], and silicon [38%]). For aluminum, iron, and manganese, the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the variability of the native concentration rather than a measure of the recovery from the sample. Antimony and silicon did not have mismatched spike and native concentrations in the MS. Although not qualified for MS recoveries outside the quality control (QC) limits, all antimony and silicon results in SDG J02094 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the laboratory duplicate relative percent difference (RPD) for copper (31%) is above the acceptance criteria of 30%. Elevated RPDs in environmental soil samples are generally attributed to natural heterogeneities in the sample matrix. Although not qualified for the RPD above the QC limits, all copper data results in SDG J02094 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, cadmium and zinc were detected in the method blank (MB) at very low levels, less than 1/20$^{th}$ of the associated field sample result. Although not qualified for the MB contamination, all cadmium and zinc data for SDG J02094 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the laboratory duplicate RPD calculated for copper exceeded the QC limit. The laboratory has qualified the associated data with "M" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the mercury analysis, the laboratory duplicate RPD for mercury (33%) is above the acceptance criteria of 30%. Elevated RPDs in environmental soil samples are generally attributed to natural heterogeneities in the sample matrix. Although not qualified for the RPD above the QC limits, all mercury data results in SDG J02094 may be considered estimated. Estimated data are usable for decision-making purposes.

In the mercury analysis, the RPD calculated for the laboratory duplicate exceeded the QC limit. The laboratory has qualified the associated data with "M" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the IC anions by Method 9056 analysis, the holding time for nitrate, nitrite, and orthophosphate is exceeded by more than twice the limit. Nondetected results for these analytes in SDG J02094 are discussed above in the Major Deficiencies section. Detected results for these analytes may be considered estimated. Estimated data are usable for decision-making purposes.

**SDG JP0662**

This SDG comprises one focused soil sample (J1T5W6) from the 100-H-28:2 subsite road crossing (RC-3). This sample was analyzed for ICP metals, mercury, hexavalent chromium, IC anions, PCBs, semivolatile organic analysis (SVOA), TPH, and pesticides. Minor deficiencies are as follows.

In the semivolatile organic compound (SVOC) analysis, low levels of dimethyl phthalate were reported in the MB. Dimethyl phthalate is a common laboratory contaminant. Also, detections are less than 1/20th of the field sample results; therefore, there is no significant impact on the field sample data. The data are usable for decision-making purposes.

In the SVOC analysis, the laboratory control sample (LCS) recovery for 4-chloroanaline is outside the QC limits. The 4-chloroanaline was detected in the field sample results; therefore, the high bias has had no impact on the field sample data. The data are usable for decision-making purposes.

In the SVOC analysis, matrix spike (MS)/matrix spike duplicate (MSD) recoveries were reported outside the QC limits. The laboratory has qualified the associated data with "T" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the pesticides analysis, the RPDs calculated between the MS and MSD for multiple analytes are outside the QC limits. The laboratory has qualified the associated data with "*" flags. Acceptable LCS recoveries indicate that the analytical system was operating within control. The data are usable for decision-making purposes.

In the TPH analysis, TPH-diesel (C10-C28) and TPH-diesel EXT (C10-C36) was detected in the MB at very low levels, less than $1/20^{th}$ of the associated field sample result. Although not qualified for the MB contamination, TPH data for SDG JP0662 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, barium, chromium, copper, iron, manganese, and zinc were detected in the MB at very low levels, less than $1/20^{th}$ of the associated field sample result. Although not qualified for the MB contamination, barium, chromium, copper, iron, manganese, and zinc data for SDG JP0662 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the MS recovery for silicon is outside the QC limits. The laboratory has qualified the associated data with "N" flags. Silicon is known to be a poor performing analyte for this method. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the MS recoveries are out of project acceptance criteria for five analytes (aluminum [1,274%], antimony [50%], iron [1,441%], manganese [179%], and silicon [18%]). For aluminum, iron, and manganese, the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the variability of the native concentration rather than a measure of the recovery from the sample. Antimony and silicon did not have mismatched spike and native concentrations in the MS. Although not qualified for MS recoveries outside the QC limits, all antimony and silicon results in SDG JP0662 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the laboratory duplicate RPD for boron (129%) is above the acceptance criteria of 30%. Elevated RPDs in environmental soil samples are generally attributed to natural heterogeneities in the sample matrix. Although not qualified for the RPD above the QC limits, all boron data results in SDG JP0662 may be considered estimated. Estimated data are usable for decision-making purposes.

In the IC anions analysis, phosphate was detected in the MB at very low levels, less than 1/20$^{th}$ of the associated field sample result. Phosphate is not a COPC for the 100-H-28:2 subsite, nor is it a regulated compound under the WAC 173-340 "Model Toxics Control Act – Cleanup." Although not qualified for LCS recovery outside the QC limits, all phosphate results in SDG JP0662 may be considered estimated. Estimated data are usable for decision-making purposes.

In the IC anions analysis, the MS recovery for phosphate is outside the QC limits. The laboratory has qualified the associated data with "N" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

**SDG JP0883**

This SDG comprises 12 statistical soil samples (J1V255 through J1V266) from the 100-H-28:2 and 100-H-42 waste site overburden area. This SDG includes one field duplicate pair (J1V263/J1V267). These samples were analyzed for ICP metals, mercury, hexavalent chromium, IC anions, nitrate/nitrite, PCBs, SVOC, TPH, polycyclic aromatic hydrocarbons (PAH), pH, pesticides, gamma energy analysis (GEA), carbon-14, and nickel-63. In addition, one field equipment blank (J1V268) was collected and analyzed for ICP metals, mercury, and SVOC. Minor deficiencies are as follows.

In the ICP metals analysis, the MS recoveries are out of project acceptance criteria for eight analytes (aluminum [1,531%], antimony [56%], chromium [211%], iron [5,264%], magnesium (204%), manganese [282%], nickel (163%), and silicon [24%]). For aluminum, iron, and manganese, the spiking concentration was insignificant compared to the native concentration in

the sample from which the MS was prepared. The deficiency in the MS is a reflection of the variability of the native concentration rather than a measure of the recovery from the sample. Antimony, chromium, magnesium, nickel, and silicon did not have mismatched spike and native concentrations in the MS. Although not qualified for MS recoveries outside the QC limits, all antimony, chromium, magnesium, nickel, and silicon results in SDG JP0883 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the laboratory duplicate RPD for chromium (115%), cobalt (33%), magnesium (54%), and nickel (74%) are above the acceptance criteria of 30%. Elevated RPDs in environmental soil samples are generally attributed to natural heterogeneities in the sample matrix. Although not qualified for the RPD above the QC limits, all chromium, cobalt, magnesium, and nickel data results in SDG JP0883 may be considered estimated. Estimated data are usable for decision-making purposes.

In the IC anions by Method 9056 analysis, the holding time for nitrate, nitrite, and orthophosphate is exceeded by more than twice the limit. Nondetected results for these analytes in SDG JP0883 are discussed above in the Major Deficiencies section. Detected results for these analytes may be considered estimated. Estimated data are usable for decision-making purposes.

In the TPH analysis, the MS recovery is above the QC limits. The RPD calculated between the MS and the MSD was also outside the QC limits. Acceptable LCS results indicate the analytical system was operating within control. This result appears to be a spiking error. There is no impact to the field sample data. The data are usable for decision-making purposes.

In the SVOC analysis, the LCS recovery for 4-chloroanaline (47%) is outside the QC limits. The 4-chloroanaline was detected in the field sample results; therefore, the high bias has had no impact on the field sample data. The data are usable for decision-making purposes.

In the SVOC analysis, due to high target analyte concentrations the samples (J1V266 and J1V267) were diluted by as much as 200 fold. The laboratory has qualified the associated data with "D" flags. The reporting limits have been adjusted appropriately. The data are usable for decision-making purposes.

In the pesticides analysis, matrix interference has impacted 4,4-dichlorodiphenyltrichloroethane (DDT) in sample J1V266. The laboratory has qualified the associated data with "X" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the PAH analysis, the RPDs calculated between the primary and confirmatory columns for benzo(b)fluoranthene in sample J1V263 and for acenaphthene in sample J1V266 exceeded the QC limits. The laboratory has reported matrix interference is evident on both columns and qualified the associated data with "X" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the PAH analysis, due to high target analyte concentrations the sample J1V266 was diluted by as much as 200 fold. The laboratory has qualified the associated data with "D" flags.

The reporting limits have been adjusted appropriately. The data are usable for decision-making purposes.

**SDG JP0884**

This SDG comprises 12 statistical soil samples (J1V286 through J1V297) from the 100-H-28:2 and 100-H-42 waste site excavation 2 area. This SDG includes one field duplicate pair (J1V292/J1V298). These samples were analyzed for ICP metals, mercury, hexavalent chromium, IC anions, nitrate/nitrite, PCBs, SVOA, TPH, PAH, hydrogen ion concentration (pH), pesticides, GEA, carbon-14, and nickel-63. Minor deficiencies are as follows.

In the ICP metals analysis, aluminum, iron, and zinc were detected in the MB at very low levels, less than 1/20$^{th}$ of the associated field sample result. Although not qualified for the MB contamination, all aluminum, iron, and zinc for SDG JP0884 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the LCS recovery for silicon was below the project recovery limit at 8%. Although not qualified for the LCS recoveries, all silicon data for SDG JP0884 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the MS recoveries are out of project acceptance criteria for five analytes (aluminum [926%], antimony [66%], iron [1,394%], manganese [180%], and silicon [18%]). For aluminum, iron, and manganese, the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the variability of the native concentration rather than a measure of the recovery from the sample. Antimony and silicon did not have mismatched spike and native concentrations in the MS. Although not qualified for MS recoveries outside the QC limits, all antimony and silicon results in SDG JP0884 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the laboratory duplicate RPD for cadmium (42%) is above the acceptance criteria of 30%. Elevated RPDs in environmental soil samples are generally attributed to natural heterogeneities in the sample matrix. Although not qualified for the RPD above the QC limits, all cadmium data results in SDG JP0884 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, due to matrix interference, samples J1V289, J1V295, and J1V296 required a 2X dilution for beryllium analysis. The reporting limits have been adjusted appropriately. The data are usable for decision-making purposes.

In the IC anions by Method 9056 analysis, the holding time for nitrate, nitrite, and orthophosphate is exceeded by more than twice the limit. Nondetected results for these analytes in SDG JP0884 are discussed above in the Major Deficiencies section. Detected results for these analytes may be considered estimated. Estimated data are usable for decision-making purposes.

In the TPH analysis, the MSD recovery is above the QC limits. The RPD calculated between the MS and the MSD was also outside the QC limits. Acceptable LCS results indicate the analytical system was operating within control. This result appears to be a spiking error. There is no impact to the field sample data. The data are usable for decision-making purposes.

In the pesticides analysis, matrix interference has impacted 4,4-DDT in sample J1V297. The laboratory has qualified the associated data with "X" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

In the pesticide analysis, the continuing calibration verification standards for samples J1V286, J1V287, J1V288, J1V289, and J1V290 did not all meet the primary QC criteria. However, for the pesticide method the secondary QC criteria allows for a percentage of outliers. The continuing calibration verification standards meet the secondary QC criteria. The data are usable for decision-making purposes.

In the PAH analysis, the MS/MSD recoveries for sample J1V294 were outside the QC limits. The laboratory has qualified the associated data with "N" flags. These data may be considered estimated. Estimated data are usable for decision-making purposes.

**SDG JP0885**

This SDG comprises 12 statistical soil samples (J1V269 through J1V280) and 4 focused soil samples (J1V281 through J1V284) from the 100-H-28:2 and 100-H-42 waste site excavation 1 area. This SDG includes one field duplicate pair (J1V272/J1V285). These samples were analyzed for ICP metals, toxicity characteristic leaching procedure (TCLP) metals, mercury, hexavalent chromium, IC anions, nitrate/nitrite, PCBs, SVOA, TPH, PAH, pH, pesticides, GEA, carbon-14, and nickel-63. SDG JP0885 was submitted for third-party validation. Minor deficiencies are as follows.

In the IC anions analysis, holding times were exceeded by less than twice the specified holding time for nitrate, nitrite, orthophosphate, and pH. All nitrate, nitrite, orthophosphate, and pH results were qualified as estimated with "J" flags by third-party validation. Estimated data are usable for decision-making purposes.

In the carbon-14 analysis, due to the lack of MS analysis, all carbon-14 results in SDG JP0885 were qualified as estimated with "J" flags by third-party validation. Estimated data are usable for decision-making purposes.

In the SVOC analysis, the LCS recovery for 4-chloroanaline (43%) is outside the QC limits. Third-party validation qualified all 4-chloroanaline results in SDG JP0885 as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the TPH analysis, the MSD recovery for TPH-diesel EXT (C10-C36) is above the QC limits. The RPD calculated between the MS and the MSD for TPH-diesel EXT (C10-C36) was also outside the QC limits. Acceptable LCS results indicate the analytical system was operating

within control. Third-party validation qualified all TPH-diesel EXT (C10-C36) results as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the MS recoveries for antimony (55%) and silicon (21%) are outside the QC limits. Silicon is a known poor performing analyte for this analytical method. Third-party validation qualified all antimony and silicon results in SDG JP0885 as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the ICP analysis, the LCS recovery for silicon (7%) is below the project QC limits. All silicon results for SDG JP0885 were qualified by third-party validation as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the laboratory duplicates RPDs for arsenic (57%) and lead (169%) are above the project QC limit of 30%. Elevated RPDs in environmental samples are generally attributed to natural heterogeneities in the sample matrix. All lead results in SDG JP0885 were qualified by third-party validation as estimated with "J" flags. Estimated data are usable for decision-making purposes.

In the TCLP- ICP metals analysis, due to method blank contamination, the TCLP arsenic result in sample J1V283 was qualified as undetected with "U" flag by third-party validation. The data are usable for decision-making purposes.

In the pesticide analysis, due to a lack of MS, MSD, or LCS results for toxaphene, third-party validation has qualified all toxaphene results in SDG JP0885 as estimated with "J" flags. This is a standard result for toxaphene, which is a mixture of compounds that would interfere with the evaluation of other analytes if it were included in the spiking mixtures. Estimated data are usable for decision-making purposes.

**SDG JP0910**

This SDG comprises two statistical replacement soil samples (J1V4N1 and J1V4N2) from the 100-H-28:2 and 100-H-42 waste site overburden area, sampling locations OVB-9 and OVB-12. This SDG includes one field duplicate pair (J1V4N2/J1V4N3). These samples were analyzed for ICP metals, mercury, hexavalent chromium, IC anions, nitrate/nitrite, PCBs, SVOA, TPH, PAH, pH, pesticides, GEA, carbon-14, and nickel-63. Minor deficiencies are as follows.

In the SVOC analysis, the MSD recovery for 2,4-dinitrophenol (46%) is slightly below the project QC limit. The MSD recovery is in the range of 40 to 50%, suggesting a spiking error in the sample preparation. The MS recoveries were within the QC range. Although not qualified for the MSD recoveries below the QC limit, all 2,4-dinitrophenol data in SDG JP0910 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, barium, calcium, chromium, and magnesium were detected in the MB at very low levels, less than $1/20^{th}$ of the associated field sample result. Although not qualified for the MB contamination, all barium, calcium, chromium, and magnesium results for

SDG JP0910 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the LCS recovery for silicon was below the project recovery limit at 6%. Although not qualified for the LCS recoveries, all silicon data for SDG JP0910 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the MS recoveries are out of project acceptance criteria for five analytes (aluminum [834%], antimony [64%], iron [529%], manganese [144%], and silicon [26%]). For aluminum, iron, and manganese, the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the variability of the native concentration rather than a measure of the recovery from the sample. Antimony and silicon did not have mismatched spike and native concentrations in the MS. Although not qualified for MS recoveries outside the QC limits, all antimony and silicon results in SDG JP0910 may be considered estimated. Estimated data are usable for decision-making purposes.

In the IC anions analysis, chloride was detected in the MB at very low levels, less than 1/20$^{th}$ of the associated field sample result. Although not qualified for the MB contamination, all chloride results for SDG JP0910 may be considered estimated. Estimated data are usable for decision-making purposes.

In the IC anions by Method 9056 analysis, the holding times for nitrate, nitrite, and orthophosphate were exceeded by more than twice the limit. Nondetected results for these analytes in SDG JP0910 are discussed above in the Major Deficiencies section. Detected results for these analytes may be considered estimated. Estimated data are usable for decision-making purposes.

**SDG JP0911**

This SDG comprises 14statistical soil samples (J1V4L5 through J1V4L9, J1V4M0 through J1V4M4, J1V4M7, J1V4m8, and J1V4N0) from the staging pile area and includes one field duplicate pair (J1V4L5/J1V4N0). These samples were analyzed for ICP metals, mercury, hexavalent chromium, IC anions, nitrate/nitrite, PCBs, SVOA, TPH, PAH, pH, pesticides, GEA, carbon-14, and nickel-63. Minor deficiencies are as follows.

In the SVOC analysis, the MS recovery for 2,4-dinitrophenol (48%) is slightly below the project QC limit. The MS recovery is in the range of 40 to 50%, suggesting a spiking error in the sample preparation. The MSD recovery was within the QC range. Although not qualified for the MS recoveries below the QC limit, all 2,4-dinitrophenol results in SDG JP0911 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, barium, calcium, and magnesium were detected in the MB at very low levels, less than 1/20$^{th}$ of the associated field sample result. Although not qualified for the MB contamination, all barium, calcium, and magnesium results for SDG JP0911 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the LCS recovery for silicon was below the project recovery limit at 8%. Although not qualified for the LCS recoveries, all silicon results for SDG JP0911 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the MS recoveries are out of project acceptance criteria for five analytes (aluminum [1,197%], antimony [59%], calcium [145%], iron [396%], and silicon [15%]). For aluminum and iron, the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the variability of the native concentration rather than a measure of the recovery from the sample. Antimony, calcium, and silicon did not have mismatched spike and native concentrations in the MS. Although not qualified for MS recoveries outside the QC limits, all antimony, calcium, and silicon results in SDG JP0911 may be considered estimated. Estimated data are usable for decision-making purposes.

In the IC anions by Method 9056 analysis, the holding times for nitrate, nitrite, and orthophosphate were exceeded by more than twice the limit. Nondetected results for these analytes in SDG JP0911 are discussed above in the Major Deficiencies section. Detected results for these analytes may be considered estimated. Estimated data are usable for decision-making purposes.

**SDG JP0921**

This SDG comprises one statistical replacement sample (J1V542) from the 100-H-28:2 excavation 1 area. This sample was analyzed for ICP metals, mercury, hexavalent chromium, IC anions, nitrate/nitrite, PCBs, SVOA, TPH, PAH, pH, pesticides, GEA, carbon-14, and nickel-63. In addition, one field equipment blank (J1V544) was collected and analyzed for ICP metals, mercury, and SVOC. Minor deficiencies are as follows.

In the ICP metals analysis, aluminum, barium, calcium, copper, magnesium, and manganese were detected in the MB at very low levels, less than $1/20^{th}$ of the associated field sample result. Although not qualified for the MB contamination, all aluminum, barium, calcium, copper, magnesium, and manganese results for SDG JP0921 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the LCS recovery for silicon was below the project recovery limit at 5%. Although not qualified for the LCS recoveries, all silicon results for SDG JP0921 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the MS recoveries are out of project acceptance criteria for five analytes (antimony [65%], barium [65%], iron [-996], manganese [140%], and silicon [5%]). For iron and manganese, the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the variability of the native concentration rather than a measure of the recovery from the sample. Antimony, barium, and silicon did not have mismatched spike and native concentrations in the MS. Although not qualified for MS recoveries outside the QC limits,

all antimony, barium, and silicon results in SDG JP0921 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the laboratory duplicate RPD for arsenic (33%), barium (36%), boron (55%), lead (40%), and sodium (53%) are above the acceptance criteria of 30%. Elevated RPDs in environmental soil samples are generally attributed to natural heterogeneities in the sample matrix. Although not qualified for the RPD above the QC limits, all arsenic, barium, boron, lead, and sodium results in SDG JP0921 may be considered estimated. Estimated data are usable for decision-making purposes.

In the IC anions analysis, chloride was detected in the MB at very low levels, less than $1/20^{th}$ of the most stringent cleanup level. Although not qualified for the MB contamination, all chloride results for SDG JP0921 may be considered estimated. Estimated data are usable for decision-making purposes.

In the IC anions by Method 9056 analysis, the holding times for nitrate, nitrite, and orthophosphate were exceeded by more than twice the limit. Nondetected results for these analytes in SDG JP0921 are discussed above in the Major Deficiencies section. Detected results for these analytes may be considered estimated. Estimated data are usable for decision-making purposes.

**SDG JP0938**

This SDG comprises three statistical replacement samples (J1V4M5, J1V4M6, and J1V4M9) from the staging pile area, locations SPA-11, SPA-12, and SPA-15, respectively. These samples were analyzed for ICP metals, mercury, hexavalent chromium, IC anions, nitrate/nitrite, PCBs, SVOA, TPH, PAH, pH, pesticides, GEA, carbon-14, and nickel-63. Minor deficiencies are as follows.

In the SVOC analysis, the MS and MSD recoveries for many of the analytes are below the QC limits. The MS and MSD recoveries are in the range of 40 to 50%, suggesting a spiking error in the sample preparation. The laboratory has qualified the associated data with "T" flags. The RPDs calculated between the MS and MSD were within the QC limits. Although not qualified for MS and MSD recoveries below the QC limit, all associated results in SDG JP0938 may be considered estimated. Estimated data are usable for decision-making purposes.

In the SVOC analysis, diethyl phthalate, a common laboratory contaminant, was detected in the MB at a concentration greater than the reporting limit. Although not qualified for MB contamination, all diethyl phthalate data in SDG JP0938 may be considered estimated. Estimated data are usable for decision-making purposes.

In the SVOC analysis, the 4-chloroanaline (46%) LCS recovery is below the project QC limit. Although not qualified for LCS recovery below the QC limits, all 4-chloroanaline data in SDG JP0938 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, barium, calcium, and magnesium were detected in the MB at very low levels, less than 1/20$^{th}$ of the associated field sample result. Although not qualified for the MB contamination, all barium, calcium, and magnesium data for SDG JP0938 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the LCS recovery for silicon was below the project recovery limit at 13%. Although not qualified for the LCS recoveries, all silicon data for SDG JP0938 may be considered estimated. Estimated data are usable for decision-making purposes.

In the ICP metals analysis, the MS recoveries are out of project acceptance criteria for six analytes (aluminum [1,078%], antimony [58%], calcium [131%], iron [3,550%], manganese [179%], and silicon [35%]). For aluminum, iron, and manganese, the spiking concentration was insignificant compared to the native concentration in the sample from which the MS was prepared. The deficiency in the MS is a reflection of the variability of the native concentration rather than a measure of the recovery from the sample. Antimony, calcium, and silicon did not have mismatched spike and native concentrations in the MS. Although not qualified for MS recoveries outside the QC limits, all antimony, calcium, and silicon results in SDG JP0938 may be considered estimated. Estimated data are usable for decision-making purposes.

In the IC anions analysis, chloride was detected in the MB at very low levels, less than 1/20$^{th}$ of the most stringent cleanup level. Although not qualified for the MB contamination, all chloride results for SDG JP0938 may be considered estimated. Estimated data are usable for decision-making purposes.

In the IC anions by Method 9056 analysis, the holding times for nitrate, nitrite, and orthophosphate were exceeded by more than twice the limit. Nondetected results for these analytes in SDG JP0921 are discussed above in the Major Deficiencies section. Detected results for these analytes 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 logbooks (WCH 2013, 2014a, 2015), 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 |
|---|---|---|
| Excavation 1 | J1V272 | J1V285 |
| Excavation 2 | J1V292 | J1V298 |
| Staging pile area | J1V4L5 | J1V4N0 |
| Overburden (initial data) | J1V263 | J1V267 |
| Overburden resample | J1V4N1 | J1V4N3 |

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. 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. 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.

None of the duplicate RPDs calculated for 100-H-28:2 and 100-H-42 data set are above the duplicate acceptance criteria of 30%. Elevated RPDs in environmental samples are generally attributed to natural heterogeneity in the sample matrix. 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 duplicate) is less than five times the target detection limit. In these cases, a control limit of ±2 times the target detection limit is used (Appendix C) to indicate that a visual check of the data is required by the reviewer. None of the samples required this check. A visual inspection of all of the data is also performed. No additional major or minor deficiencies were 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-H-28:2 and 100-H-42 waste sites 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 100-H-28:2 and 100-H-42 waste sites 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 a 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.

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