Date Submitted <u>8/20/08</u>	WASTE SITE RECLASSIFICATION FORM Operable Unit(s): <u>100-FR-1</u> Waste Site Code: <u>100-F-26:9</u> Type of Reclassification Action: Closed Out ☐ Interim Closed Out ☒ No Action ☐ RCRA Postclosure ☐ Rejected ☐ Consolidated ☐	Control Number: 2008-029
Originator: <u>J. M. Capron</u>		
Phone: <u>372-9227</u>		

This form documents agreement among parties listed authorizing classification of the subject unit as Closed Out, Interim Closed Out, No Action, RCRA Postclosure, Rejected, or Consolidated. This form also authorizes backfill of the waste management unit, if appropriate, for Closed Out and Interim Closed Out units. Final removal from the NPL of No Action and Closed Out waste management units will occur at a future date.

Description of current waste site condition:

The 100 F 26:9 underground pipeline subsite consists of the sanitary sewers servicing the 105-F, 108-F, 184-F, 185-F, and 190-F buildings, and the 1700-F administration and service buildings (1704-F, 1707-F, 1707-FA, 1713 F, 1717-F, 1719-F, and 1722-F).. Confirmatory sampling, remediation and verification sampling of this site have been performed in accordance with remedial action objectives and goals established by 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)*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington. The selected action involved: (1) evaluating the site using available process information and confirmatory sampling data, (2) remediating the site, (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:

In accordance with this evaluation, the confirmatory and verification sampling results support a reclassification of this site to Interim Closed Out. The current site conditions achieve the remedial action objectives and the corresponding remedial action goals established in the Remaining Sites ROD. The results of verification sampling show 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. Site contamination did not extend into the deep zone soils; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone are not required. The basis for reclassification is described in detail in the Remaining Sites Verification Package for the 100-F-26:10, 1607-F3 Sanitary Sewer Pipelines (182-F, 183-F, and 151-F Sanitary Sewer Lines) (attached).

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.

M. S. French DOE Federal Project Director (printed)	Signature	<u>10/19/08</u> Date
N/A Ecology Project Manager (printed)	Signature	Date
R. A. Lobos EPA Project Manager (printed)	Signature	<u>10/29/08</u> Date

**REMAINING SITES VERIFICATION PACKAGE FOR THE
100-F-26:9, 1607-F2 SANITARY SEWER PIPELINES**

Attachment to Waste Site Reclassification Form 2008-029

July 2008

REMAINING SITES VERIFICATION PACKAGE FOR THE 100-F-26:9, 1607-F2 SANITARY SEWER PIPELINES

EXECUTIVE SUMMARY

The 100-F-26 site includes the underground process and sanitary sewer pipelines associated with the 100-F Area pre-reactor cooling water treatment facilities. For the confirmatory sampling effort, the 100-F-26 site was divided into 16 subsites, designated 100-F-26:1 through 100-F-26:16, based on intended use of the pipe (e.g., sanitary sewer or process water), expected sources of contamination, and potential remedial actions. The 100-F-26:9 underground pipeline subsite consists of the sanitary sewers servicing the 105-F, 108-F, 184-F, 185-F, and 190-F buildings, and the 1700-F administration and service buildings (1704-F, 1707-F, 1707-FA, 1713-F, 1717-F, 1719-F, and 1722-F).

Confirmatory sampling occurred during December 2004 and January 2005 (BHI 2005b, 2005c). The sample design defined eleven service areas based on the direction of flow in the pipelines and the facilities being serviced by the pipelines. Test pits were dug at 12 locations to obtain samples from the junction boxes, buried sewer pipes, and underlying soils. Photographs of the sampling activities are contained in Appendix A. The samples were analyzed for gross alpha and beta activity, gamma energy-emitting radionuclides, semivolatile organic compounds, polychlorinated biphenyls (PCBs), total petroleum hydrocarbons (TPH), inductively coupled metals, mercury, and hexavalent chromium in accordance with the confirmatory work instruction (BHI 2004).

The results of the confirmatory sampling showed that seven of the eleven service areas achieved the remedial action objectives and remedial action goals (RAGs) without remediation. The remaining service areas (Service Areas 2, 9, 10 and 11) required remediation based on the presence of antimony, arsenic, barium, cadmium, hexavalent chromium, lead, mercury, benzo(a)pyrene, pentachlorophenol, and Aroclor-1254 above direct exposure RAGs and/or soil RAGs for the protection of groundwater and the Columbia River. The results of the confirmatory sampling and the basis for the remediation decision was documented in a partial remaining site verification package (Feist 2005), as provided for in the *100 Area Remedial Action Sampling and Analysis Plan* (DOE-RL 2005a).

Remediation of Service Areas 2, 9, 10 and 11 of the 100-F-26:9 pipeline subsite was performed from February 8 through October 30, 2007. Photographs of the remediation activities are contained in Appendix A. The site was excavated to a depth of approximately 3.7 m (12 ft) below grade, resulting in approximately 1,360 bank cubic meters (BCM) (1,780 bank cubic yards [BCY]) of material disposed of at the Environmental Restoration Disposal Facility. Approximately 6,340 BCM (8,290 BCY) of overburden and layback soil was removed and stockpiled for use as clean backfill.

Verification sampling for the 100-F-26:9 pipeline site was performed between February 2007 and February 2008 (WCH 2007a, 2007b) to collect data to determine if the RAGs had been met.

A total of 48 samples were collected: 10 from the excavation plus one duplicate, 14 from the overburden and layback stockpiles, 10 from the staging pile footprint plus one duplicate, and 12 judgmental samples relating to the road crossings. The samples were analyzed for gross alpha and beta activity, gamma energy-emitting radionuclides, semivolatile organic compounds, PCBs, TPH, inductively coupled metals, mercury, and hexavalent chromium in accordance with the verification work instruction. The results demonstrated that the remediation reduced residual contaminant concentrations to levels protective of human health, groundwater, and the Columbia River.

A summary of the cleanup evaluation for the soil sample results against the applicable criteria is presented in Table ES-1. The evaluation includes results from the seven service areas requiring no remediation based on confirmatory sampling and the verification results from the remaining four service areas (2, 9, 10 and 11) following remediation. Service areas 2, 9 and 10 were remediated because confirmatory sampling indicated that contaminants exceeded the remedial action goals. Service area 11 was remediated since it was downstream of service areas 2 and 10.

In accordance with this evaluation, the confirmatory and verification sampling results support a reclassification of this site to Interim Closed Out. The current site conditions achieve the remedial action objectives and the corresponding RAGs established in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 2005b) 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* (EPA 1999). The results of sampling show 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. The site does not have a deep zone or residual contaminant concentrations that would require any institutional controls.

Soil cleanup levels were established in the Remaining Sites Records of Decision (ROD) (EPA 1999), based 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-F-26:9 contaminants of potential concern. Screening levels were exceeded at the site for the following constituents: antimony, arsenic, barium, boron, chromium, copper, lead, manganese, mercury, nickel, selenium, vanadium, and zinc. Exceedance of screening values does not necessarily indicate the existence of risk to ecological receptors because antimony, arsenic, manganese, mercury, selenium, and vanadium are below site background. Boron concentrations are consistent with those seen elsewhere at the Hanford Site (no established background value is available for boron). Exceedances for barium, chromium, copper, lead, nickel, and zinc will be evaluated in the context of additional lines of evidence for ecological effects.

Table ES-1. Summary of Remedial Action Goals for the 100-F-26:4 Pipeline Site.

Regulatory Requirement	Remedial Action Goals	Results	Remedial Action Objectives Attained?
Direct Exposure Radionuclides	Attain 15 mrem/yr dose rate above background over 1,000 years.	The maximum dose rate estimated using generic dose equivalence lookup values is 0.7 mrem/yr.	Yes
Direct Exposure Nonradionuclides	Attain individual COC/COPC RAGs.	All individual COC/COPC concentrations are below the direct exposure RAGs.	Yes
Risk Requirements Nonradionuclides	Attain a hazard quotient of <1 for all individual noncarcinogens.	All individual hazard quotients are <1.	Yes
	Attain a cumulative hazard quotient of <1 for noncarcinogens.	The maximum cumulative hazard quotient (6.3×10^{-1}) is <1.	
	Attain an excess cancer risk of $<1 \times 10^{-6}$ for individual carcinogens.	The excess cancer risk values for individual carcinogens are $<1 \times 10^{-6}$.	
	Attain a total excess cancer risk of $<1 \times 10^{-5}$ for carcinogens.	The maximum cumulative cancer risk value (3.4×10^{-6}) is $<1 \times 10^{-5}$.	
Groundwater/River Protection – Radionuclides	Attain single COC/COPC groundwater and river protection RAGs.	RESRAD modeling predicts no radionuclides will migrate to groundwater within 1,000 years. Groundwater and river RAOs are therefore attained.	Yes
	Attain national primary drinking water regulations: ^a 4 mrem/yr (beta/gamma) dose rate to target receptor/organs.		
	Meet drinking water standards for alpha emitters: the more stringent of 15 pCi/L MCL or 1/25th of the derived concentration guide from DOE Order 5400.5. ^b	No alpha-emitting radionuclide COCs were quantified above groundwater/river protection lookup values.	
	Meet total uranium standard of 21.2 pCi/L. ^c	Uranium isotopes were not identified as COCs/COPCs. U-235 and U-238 were not detected by gamma energy analysis.	
Groundwater/River Protection – Nonradionuclides	Attain individual nonradionuclide groundwater and river cleanup requirements.	Residual concentrations of various metals and organic compounds exceeded soil RAGs for the protection of groundwater and/or the Columbia River. However, it is predicted that these constituents will not migrate to groundwater (and thus the Columbia River) at concentrations exceeding groundwater or river criteria within 1,000 years. Therefore, residual concentrations achieve the remedial action objectives for groundwater and river protection. ^{d,e}	Yes

^a “National Primary Drinking Water Regulations” (40 *Code of Federal Regulations* 141).

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

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

^d Based on the *100 Area Analogous Sites RESRAD Calculations* (BHI 2005a), these constituents are not predicted to migrate more than 3 m (10 ft) vertically in 1,000 years (based on the lowest soil-partitioning coefficient distribution [copper] of 22 mL/g). The vadose zone underlying the remediation footprint is more than 5 m (16 ft) thick.

^e Site-specific RESRAD evaluation using uranium-238 as a surrogate for hexavalent chromium determined that the mass of residual contamination was insufficient to exceed groundwater and river protection criteria within 1,000 years.

COC = contaminant of concern

COPC = contaminant of potential concern

MCL = maximum contaminant level

RAG = remedial action goal

RAO = remedial action objective

RESRAD = RESidual RADioactivity (dose assessment model)

DOE = U.S. Department of Energy

REMAINING SITES VERIFICATION PACKAGE FOR 100-F-26:9, 1607-F2 SANITARY SEWER PIPELINES

STATEMENT OF PROTECTIVENESS

The 100-F-26:9 1607-F2 Sanitary Sewer Pipelines subsite sample results demonstrate that the site achieves the remedial action objectives and remedial action goals (RAGs) established in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP) (DOE-RL 2005b) 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* (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. The site does not have a deep zone nor residual contaminant concentrations that would require any institutional controls.

Soil cleanup levels were established in the Remaining Sites ROD (EPA 1999), based 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-F-26:9 contaminants of potential concern (COPC). Screening levels were exceeded at the site for the following constituents: antimony, arsenic, barium, boron, chromium, copper, lead, manganese, mercury, nickel, selenium, vanadium, and zinc. Exceedance of screening values does not necessarily indicate the existence of risk to ecological receptors because antimony, arsenic, manganese, mercury, selenium, and vanadium are below site background. Boron concentrations are consistent with those seen elsewhere at the Hanford Site (no established background value is available for boron). Exceedances for barium, chromium, copper, lead, nickel, and zinc will be evaluated in the context of additional lines of evidence for ecological effects.

GENERAL SITE INFORMATION AND BACKGROUND

The 100-F-26 site includes the underground process and sanitary sewer pipelines associated with the 100-F Area pre-reactor cooling water treatment facilities. For the confirmatory sampling effort, the 100-F-26 site was divided into 16 subsites, designated 100-F-26:1 through 100-F-26:16, based on intended use of the pipe (e.g., sanitary sewers or process water supply), expected sources of contamination, and potential remedial actions. This remaining sites verification package addresses only one of these subsites, 100-F-26:9; the other subsites are discussed in separate documentation. The 100-F-26:9 underground pipeline subsite consists of the sanitary sewers servicing the 105-F, 108-F, 184-F, 185-F, and 190-F buildings, and the 1700 F administration and service buildings (1704-F, 1707-F, 1707-FA, 1713-F, 1717-F, 1719 F, and 1722-F) (Figure 1).

Figure 1. 100-F-26:9 Pipeline Location Map.

The pipelines in 100-F-26:9 were further subdivided into “service areas” for purposes of planning the confirmatory sampling effort. The basis and methodology used to subdivide the pipelines is discussed later in this document under the confirmatory sampling design section. Refer to Figures 2 and 3 for a map and general depiction of the service areas.

The service areas were defined as follows:

- Service Area 1 (185-F Deaeration Plant sanitary sewer)
 - 67.9 m (223 ft) of 0.15 m (6-in.) vitrified clay pipe (VCP)
 - 69.6 m (228 ft) of 0.2 m (8-in.) VCP
- Service Area 2 (190-F Process Pump House sanitary sewer)
 - 28.6 m (93.9 ft) of 0.10 m (4-in.) cast iron pipe
 - 162 m (531 ft) of 0.15 m (6-in.) VCP
- Service Area 3 (105-F Reactor Building sanitary sewer)
 - 191 m (627 ft) of 0.15 m (6-in.) VCP
- Service Area 4 (108-F Biology Laboratory sanitary sewer)
 - 73.7 m (242 ft) of 0.15 m (6 in.) VCP
- Service Area 5 (1704-F, 1707-F, 1713-F and 1719-F buildings sanitary sewer)
 - 64.4 m (211 ft) of 0.15 m (6-in.) VCP
 - 34.0 m (112 ft) of 0.2 m (8-in.) VCP
- Service Area 6 (1717-F Combined Shops Building sanitary sewer)
 - 6.1 m (20.0 ft) of 0.15 m (6-in.) VCP
 - 78.0 m (256 ft) of 0.2 m (8-in.) VCP
- Service Area 7 (1707-F Patrol Headquarters sanitary sewer)
 - 11.7 m (38.2 ft) of 0.15 m (6-in.) VCP
- Service Area 8 (1722-F Area Shop sanitary sewer)
 - 14.0 m (46.1 ft) of 0.15 m (6-in.) VCP
- Service Area 9 (184-F Power House sanitary sewer)
 - 268 m (879 ft) of 0.15 m (6-in.) VCP
- Service Area 10 (western sanitary sewer collection line)
 - 118 m (387 ft) of 0.2 m (8-in.) VCP
- Service Area 11 (central sanitary sewer collection line)
 - 120 m (393 ft) of 0.2 m (8-in.) VCP.

Figure 2. 100-F-26:9 Pipeline Service Areas.

Figure 3. Oblique View of the 100-F Area with Sewer Pipeline Sketch (December 22, 1944).

BHI (1994) reports the 1607-F2 septic tank was posted as an underground radioactive material area, although none of the applicable references list it as a radioactively contaminated site and there are no records of radiological wastes being disposed to it. Group 4 Remedial Design field investigations sampled sludge in the tank bottom and found elevated levels of PAHs, cobalt-60, cesium 137, strontium-90, europium-154, europium-155, radium-226, plutonium-238, plutonium-239, plutonium-240, and uranium-234, uranium-235, and uranium-238. The septic tank and drain field were remediated and Interim Closed Out in 2002 (BHI 2003).

DOE-RL (1992) reports that after 105-F Reactor operations ceased in 1965, some of the office buildings and maintenance shops previously associated with the reactor were used for animal research operations. The 1707-F Building was converted to a dog inhalation laboratory and the 1707-FA Building was converted to a rodent inhalation laboratory. The 1713-F Building was used as a pathology laboratory, the 1719 F Building was used as an animal care facility, and the 1701-FA Building was used to house small animals. It is not known what radioisotopes or other chemicals were used in these buildings, although their use as laboratories may explain the radiological contamination in the septic tank that serviced them.

CONFIRMATORY ACTIVITIES

Contaminants of Potential Concern

The COPCs identified in the *100 Area Remedial Action Sampling and Analysis Plan* (DOE-RL 2005a) for the 100-F-26 underground pipeline site include cobalt-60, cesium-137, europium-152, europium-154, strontium-90, silver, barium, cadmium, chromium (total), mercury, lead, selenium, arsenic, and hexavalent chromium. Analytical results of samples taken from sludge in the bottom of the 1607-F2 septic tank led to the inclusion of semivolatile organic compounds, europium-155, plutonium-238, plutonium-239, plutonium-240, uranium-234, uranium-235, and uranium-238 as COPCs for this site. Further evaluation of this site led to a decision to add polychlorinated biphenyls (PCBs) and total petroleum hydrocarbons (TPH) as well.

In accordance with the work instruction for confirmatory sampling (BHI 2004), field screening for volatile organic compounds (VOCs) was performed during sampling to assess the presence of VOCs. Since no VOCs were detected in the field, volatile organic analysis (VOA) was not included in the requested analyses for any samples. Similarly, although asbestos was a COPC, no suspect asbestos-containing material was identified during field activities, and thus samples for asbestos analysis were not collected.

Confirmatory Sample Design

The 100-F-26:9 pipelines were subdivided into eleven service areas for making remedial action decisions. The areas were established using historical and process knowledge, hydraulic information, and an archived Hanford Site design drawing (M-1904-F, sheet 5 [GE 1954]). Sample locations were chosen where contamination was most likely to be present. These were reasoned to be locations where there was a junction box, pipe bend, or pipeline terminus. These pipeline features provided opportunities for leakage due to pipe joints and sediment accumulation. The decrease in fluid velocity likely allowed for deposition of contaminants inside the pipes. Test pits were dug at 12 of these locations to collect samples and assess the condition of the 11 service areas (Figure 4). The test pit locations are a subset of all numbered test pits associated with 100-F-26, therefore the values do not begin with the number one, nor are they sequential.

The sample design called for obtaining two types (pipe contents and underlying soil) of samples at each location, when possible. The purpose of the pipe contents sample was to evaluate the potential for contaminants that may be present within the pipe. The underlying soil sample was collected to evaluate whether the pipeline may have released contaminants to the soil. The pipe contents sample was collected from sediment contained within the pipe. Pipe scale was scabbled from the pipe walls to obtain enough material to complete the full suite of laboratory analysis when there was not enough sediment.

Table 1 provides a summary of the samples that were collected from the 100-F-26:9 subsite and the analyses that were requested for each sample.

Figure 4. 100-F-26:4 South Process Sewer Pipeline Sampling Locations.

Table 1. Confirmatory Sample Summary for the 100-F-26:9 Site. (2 Pages)

Test Pit	Sample Media	Sample Number	Coordinate Locations ^a	Depth (bgs)	Sample Analysis
8 (SA 3)	Vitrified clay pipe (pipe material)	J025K9	N 147634 E 580556	2.8 m (9.2 ft)	Std. set ^b : PCB, SVOA, TPH, ICP metals, mercury, GEA, gross alpha, gross beta
		J02DD6			Hexavalent chromium
	Soil under pipe	J02D75		2.8 m (9.2 ft)	Std. set, hexavalent chromium
12 (SA 2)	Junction box contents (sediment)	J025K1	N 147709 E 580510	2.6 m (8.5 ft)	Std. set, hexavalent chromium
	Soil under junction box	J025K2		2.6 m (8.5 ft)	Std. set, hexavalent chromium
19 (SA 1)	Pipe contents (sediment)	J025K4	N 147780 E 580556	2.8 m (9.2 ft)	Std. set, hexavalent chromium
	Soil under junction box	J025K5		2.8 m (9.2 ft)	Std. set, hexavalent chromium
21 (SA 10)	Junction box contents (sediment)	J025J1	N 147709 E 580556	3.6 m (11.8 ft)	Std. set, hexavalent chromium
	Soil under pipe	J025J2		3.6 m (11.8 ft)	Std. set, hexavalent chromium
22 (SA 4)	Vitrified clay pipe (pipe material)	J02DD7	N 147655 E 580607	2.8 m (9.2 ft)	Hexavalent chromium
		J025L0			Std. set
	Soil under pipe	J02D76		2.8 m (9.2 ft)	Std. set, hexavalent chromium
23 (SA 10)	Junction box contents (sediment)	J025J3	N 147709 E 580607	3.4 m (11.2 ft)	Std. set, hexavalent chromium
	Soil under junction box	J025J4		3.4 m (11.2 ft)	Std. set, hexavalent chromium
24 (SA 7)	Vitrified clay pipe (pipe material)	J025K8	N 147703 E 580678	1.5 m (4.9 ft)	Std. set
		J025M4			Hexavalent chromium
	Soil under pipe	J025J5		1.5 m (4.9 ft)	Std. set, hexavalent chromium
25 (SA 8)	Vitrified clay pipe (pipe material)	J025P9	N 147702 E 580706	1.5 m (4.9 ft)	Std. set, hexavalent chromium
		J025L8			Hexavalent chromium
	Soil under pipe	J025J8		1.5 m (4.9 ft)	Std. set, hexavalent chromium

Table 1. Confirmatory Sample Summary for the 100-F-26:9 Site. (2 Pages)

Test Pit	Sample Media	Sample Number	Coordinate Locations	Depth (bgs)	Sample Analysis
26 (SA 11)	Pipe contents (sediment)	J025K0	N 147709 E 580800	3.2 m (10.5 ft)	Std. set, hexavalent chromium
	Soil under pipe	J025J9		3.2 m (10.5 ft)	Std. set, hexavalent chromium
27 (SA 9)	Pipe contents (sediment)	J025K6	N 147947 E 580799	1.6 m (5.2 ft)	Std. set
	Soil under junction box	J026D4		1.6 m (5.2 ft)	Std. set, hexavalent chromium
28 (SA 5)	Junction box contents (sediment)	J026D2	N 147789 E 580677	2.8 m (9.2 ft)	Std. set, hexavalent chromium
	Soil under junction box	J026D1		2.8 m (9.2 ft)	Std. set, hexavalent chromium
40 (SA 6)	Junction box contents (sediment)	J025J6	N 147709 E 580678	3.2 m (10.5 ft)	Std. set, hexavalent chromium
	Soil under pipe	J025J7		3.2 m (10.5 ft)	Std. set, hexavalent chromium
12 (SA 2)	Duplicate of Soil J025K2	J025K3	N 147709 E 580510	2.6 m (8.5 ft)	Std. set, hexavalent chromium

^a Source: Field logbooks EL-1578-4 and EFL-1578-5 (BHI 2005b and BHI 2005c)

^b “Std. set” refers to a group of analyses that were performed on most samples and includes: PCB, SVOA, ICP metals, mercury, GEA, gross alpha, gross beta, TPH.

bgs = below ground surface

GEA = gamma energy analysis

ICP = inductively coupled plasma

PCB = polychlorinated biphenyl

SA = service area

SVOA = semivolatile organic analysis

TPH = total petroleum hydrocarbon

Confirmatory Sample Results and Data Evaluation

Confirmatory samples were analyzed using laboratory methods approved by the U.S. Environmental Protection Agency (DOE-RL 2005a). The results are stored in the Environmental Restoration project-specific database (ENRE) prior to archiving in the Hanford Environmental Information System (HEIS) and are included in Appendix B. Comparisons of the analytical results for the 11 service areas with the shallow zone RAGs are summarized in Tables 2 through 11, and Table 13.

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 2005) under *Washington Administrative Code* (WAC) 173-340-740(3) for aluminum, calcium, iron, magnesium, potassium, silicon, and sodium; therefore, these constituents are not considered site contaminants of concern (COCs). Potassium-40, radium-226, radium-228, thorium-228, and thorium-232 were detected in samples collected at

the site, but are not considered within statistical calculations or the following tables, as these isotopes are not related 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 DOE-RL 1996).

The results that exceeded the groundwater and/or river protection RAGs were also evaluated by comparison of the soil-partitioning coefficient (K_d) with the *100 Area Analogous Sites RESRAD Calculations* (BHI 2005a) to predict if the contaminant would be expected to migrate vertically to groundwater in 1,000 years. The contaminant depth/ K_d value model assumes that uncontaminated soil exists in the vadose zone between the bottom of the pipeline site and groundwater. The assumption of an uncontaminated zone beneath the pipeline site is reasonable based on analogous site data that include test pits and boreholes completed in the operable units in the 100 and 300 Areas. The test pit and/or borehole data show that contaminant concentrations that are below direct exposure cleanup levels decrease to background concentrations within 3 m (10 ft) below the elevation at which the contamination occurs. Further, samples collected from underlying soil at 100-F-26:9 demonstrates that no significant releases to soils immediately under the pipeline have occurred. The thickness of the uncontaminated vadose zone beneath the 100-F-26:9 pipeline site has been conservatively estimated to be at least 5 m (16 ft) thick. This is based on a calculated vadose zone thickness of 8.9 m (29.2 ft) between the lowest elevation of the pipeline (122.84 m [403.04 ft]; Figure 5) and a reported groundwater elevation of 113.94 m (373.84 ft) in April 2006 (Hartman et. al. 2007). The predicted vertical migration (in 1,000 years) is presented for each test pit using the most mobile contaminant (lowest K_d) where contaminants exceed the soil RAGs for groundwater and river protection.

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 RDR/RAWP (DOE-RL 2005b). Where multiple radionuclides were detected above background, the cumulative dose was evaluated by determining the sum of fractions. Site-specific RESidual RADioactivity (RESRAD) evaluations were performed to predict the radionuclide dose and risk over a 1,000-year time frame when the cumulative dose determined by the sum of fractions exceeded 15 mrem/yr and/or the single-radionuclide dose-equivalence lookup value was exceeded.

Figure 5. 100-F-26:9 Pipeline Invert Elevations.

Service Area 1 (Test Pit 19)

Test pit 19 was excavated on December 29, 2004 (see Figure 6). The junction box was partially demolished. The excavation exposed the junction box foundation (including the brick ring forming the bottom of the structure) and the 0.2 m (8 in.) concrete encased VCP. A sediment sample (J025K4) was obtained from inside the 0.2 m (8 in.) VCP on January 3, 2005. A soil sample (J025K5) was also collected below the junction box. Test pit 19 was backfilled January 3, 2005. A 10 cm (4-in) diameter cast iron pipe was discovered approximately 1.2 m (4 ft) bgs. The pipe could not be correlated with previously documented pipelines in the area. As a result, the pipe was submitted for further evaluation as a discovery site.

The soil and sediment sample results are discussed below. Table 2 provides a comparison of the maximum detected results for COPCs from underlying soil and junction box sediment samples collected from test pit 19 against the RAGs identified in the RDR/RAWP (DOE-RL 2005b) or against cleanup levels calculated in accordance with WAC 173-340, Method B.

Figure 6. 100-F-26:9 Test Pit 19.

**Table 2. Comparison of Maximum Values to Action Levels
for the 100-F-26:9 Pipeline Subsite: Service Area 1 Samples.**

COPC	Kd Value (mL/g)	Maximum Result (pCi/g)		Generic Site Lookup Values ^a (pCi/g)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Sediment	Shallow Zone Lookup Values	Groundwater Protection Lookup Values	River Protection Lookup Values	Soil	Sediment	
Cesium-137	50	0.086	U	6.2	-- ^b	-- ^b	No	No	--
COPC	Kd Value (mL/g)	Maximum Result (mg/kg)		Remedial Action Goals ^a (mg/kg)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Sediment	Direct Exposure	Soil Standard for Groundwater Protection	Soil Standard for River Protection	Soil	Sediment	
Antimony	1.4	0.414 (<BG)	0.296 (<BG)	32	5 ^c	5 ^c	No	No	--
Arsenic	3	2.8	2.4	20 ^a	20 ^a	20 ^a	No	No	--
Barium	25	99.8 (<BG)	58.4 (<BG)	5,600	132 ^c	224	No	No	--
Beryllium	790	0.596 (<BG)	0.596 (<BG)	10.4 ^c	1.51 ^c	1.51 ^c	No	No	--
Boron	3	4.8	1.4	16,000	320	-- ^f	No	No	--
Chromium (total)	200	9.7 (<BG)	7.9 (<BG)	80,000	18.5 ^c	18.5 ^c	No	No	--
Hexavalent chromium	0	0.258	U	2.1	4.8	2	No	No	--
Cobalt	50	5.5 (<BG)	5.3 (<BG)	1,600	32	-- ^f	No	No	--
Copper	22	13.6 (<BG)	11.8 (<BG)	2,960	59.2	22.0 ^c	No	No	--
Lead	30	9.6 (<BG)	3.9 (<BG)	353	10.2 ^c	10.2 ^c	No	No	--
Manganese	50	224 (<BG)	254 (<BG)	11,200	512 ^c	512 ^c	No	No	--
Mercury	30	0.095 (<BG)	U	24	0.33 ^c	0.33 ^c	No	No	--
Molybdenum	20	0.711	0.366	400	8	-- ^f	No	No	--
Nickel	65	9.8 (<BG)	8.6 (<BG)	1,600	19.1 ^c	27.4	No	No	--
Selenium	150	U	0.412 (<BG)	400	5	1	No	No	--
Vanadium	1000	37.7 (<BG)	35.5 (<BG)	560	85.1 ^c	-- ^f	No	No	--
Zinc	30	83.5	45.7 (<BG)	24,000	480	67.8 ^c	Yes	No	Yes ^d
Benzo(a)anthracene	360	0.019	U	1.37 ^g	0.33 ^h	0.33 ^h	No	No	--
Benzo(a)pyrene	5500	0.021	U	0.33 ^h	0.33 ^h	0.33 ^h	No	No	--
Benzo(k)fluoranthene	2020	0.022	U	13.7 ^g	0.33 ^h	0.33 ^h	No	No	--
Bis(2-ethylhexyl)phthalate	110	0.022	0.018	71.4	0.6	0.36	No	No	--
Chrysene	200	0.029	U	137 ^g	1.2 ^g	0.33 ^h	No	No	--
Di-n-butylphthalate	1.57	0.018	U	8,000	160	540	No	No	--
Fluoranthene	49.1	0.037	U	3,200	64	18.0	No	No	--
Phenanthrene ⁱ	23.5	0.029	U	24,000	240	1,920	No	No	--
Pyrene	68	0.047	U	2,400	48	192	No	No	--
Aroclor-1254	75.6	0.014	U	0.5	0.017 ⁿ	0.017 ⁿ	No	No	--

^a Lookup values and RAGs obtained from the (100 Area RDR/RAWP) (DOE-RL 2005b) or calculated per WAC 173-340-720, WAC 173-340-730, and WAC 173-340-740, Method B, 1996, unless otherwise noted.

^b The 100 Area RDR/RAWP (DOE-RL 2005b) does not provide soil cleanup levels for this contaminant to be protective of groundwater and the Columbia River. Based on the soil partitioning distribution coefficient for cesium-137 of 50 mL/g, this contaminant is not predicted to migrate more than 1 m (3.3 ft) vertically in 1,000 years (BHI 2005a). The vadose zone underlying this pipeline site is at least 5 m (16 ft) thick. Therefore, residual concentration of this contaminant is predicted to be protective of groundwater and the Columbia River.

^c Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996).

^d Based on the 100 Area Analogous Sites RESRAD Calculations (BHI 2005a), residual concentrations are not expected to migrate more than 2 m (6.6 ft) vertically in 1,000 years (based on the soil-partitioning coefficient for zinc of 30 mL/g). The vadose zone underlying the pipeline site is at least 5 m (16 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

^e Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) and an airborne particulate mass-loading rate of 0.0001 g/m³ (WDOH 1997).

^f No cleanup level is available from the Cleanup Levels and Risk Calculations database (Ecology 2005) and/or no bioconcentration factors or ambient water quality criteria values are available to calculate soil cleanup levels for river protection.

^g Cleanup level calculated with updated toxicity values using the appropriate formulas from WAC 173-340-740 (Ecology 1996). Updated toxicity values are available from the EPA Integrated Risk Information System at < <http://www.epa.gov/iris> > or from the Risk Assessment Information System database of the Oak Ridge National Laboratory on the Internet at < <http://risk.lsd.ornl.gov> >.

^h Where cleanup levels are less than the RDL, cleanup levels default to the RDL (WAC 173-340-707[2], 1996 and DOE-RL 2005b).

ⁱ Toxicity data for this chemical are not available. Cleanup levels are based on the following surrogate chemicals: Contaminant: phenanthrene, surrogate: anthracene.

-- = not applicable

BG = background

COPC = contaminant of potential concern

EPA = U.S. Environmental Protection Agency

RAG = remedial action goal

RDL = required detection limit

RDR/RAWP = Remedial Design Report/Remedial Action Work Plan for the 100 Area

RESRAD = RESidual RADIOactivity (dose model)

U = not detected

WAC = Washington Administrative Code

Soil Sampling Results

Cesium-137 was the only radionuclide constituent detected in the soil sample from this test pit. It was quantified below its single-radionuclide 15 mrem/yr dose-equivalence lookup value. Cesium-137 is predicted to migrate less than 1 m (3.3 ft) vertically in 1,000 years based on its soil-partitioning coefficients. Therefore, the residual concentration of cesium-137 is predicted to be protective of groundwater and the Columbia River.

Zinc was detected at a concentration exceeding the RAG for the protection of the Columbia River. Zinc was predicted to migrate less than 2 m (6.6 ft) vertically in 1,000 years based on its soil-partitioning coefficient. Therefore, the residual concentration of zinc is predicted to be protective of groundwater and the Columbia River. All other nonradionuclide constituents were not detected at levels exceeding applicable RAGs.

Sediment Sampling Results

No radionuclide constituents were detected in the sediment samples from this test pit. No nonradionuclide constituents were detected at levels exceeding applicable RAGs.

Service Area 2 (Test Pit 12)

Excavation of test pit 12 began on December 30, 2004 (Figure 7). The junction box was found in pieces, having been previously demolished. The excavation exposed the opening to the 0.15 m (6-in.) VCP. There was not enough sediment inside the VCP to obtain a sample. The bottom of the demolished junction box was found intact. A sediment sample (J025K1) from the bottom of the junction box was obtained after the debris was removed. A soil sample (J025K2) and duplicate (J025K3) were also collected below the junction box. Test pit 12 was backfilled on January 3, 2005.

Figure 7. 100-F-26:9 Test Pit 12.

The soil and sediment sample results are discussed below. Table 3 provides a comparison of the maximum detected results for COPCs from underlying soil and junction box sediment samples collected from test pit 12 against the RAGs identified in the RDR/RAWP (DOE-RL 2005b) or against cleanup levels calculated in accordance with WAC 173-340, Method B.

Soil Sampling Results

No radionuclide constituents were detected in the soil sample from this test pit. No nonradionuclide constituents were detected at levels exceeding applicable RAGs.

Sediment Sampling Results

Cesium-137 was the only radionuclide constituent detected in the sediment sample from this test pit. It was quantified below its single-radionuclide 15 mrem/yr dose-equivalence lookup value. Cesium-137 is predicted to migrate less than 1 m (3.3 ft) vertically in 1,000 years based on its soil-partitioning coefficients. Therefore, the residual concentration of Cesium-137 is predicted to be protective of groundwater and the Columbia River.

Benzo(a)pyrene was detected in the sediment at levels exceeding the direct exposure RAG. In addition to this contaminant, barium, copper, lead, mercury, and zinc, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene were detected at concentrations exceeding RAGs for the protection of groundwater and/or the Columbia River. Each of these nonradionuclides were predicted to migrate less than 2 m (6.6 ft) vertically in 1,000 years based on their respective soil-partitioning coefficients. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River. Service area 2 was deferred for remediation based on the exceedances of the direct exposure RAG for benzo(a)pyrene.

**Table 3. Comparison of Maximum Values to Action Levels
for the 100-F-26:9 Pipeline Subsite: Service Area 2 Samples. (2 Pages)**

COPC	Kd Value (mL/g)	Maximum Result (pCi/g)		Generic Site Lookup Values ^a (pCi/g)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Sediment	Shallow Zone Lookup Values	Groundwater Protection Lookup Values	River Protection Lookup Values	Soil	Sediment	
Cesium-137	50	U	0.294	6.2	-- ^f	-- ^f	No	No	--
COPC	Kd Value (mL/g)	Maximum Result (mg/kg)		Remedial Action Goals ^a (mg/kg)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Sediment	Direct Exposure	Soil Standard for Groundwater Protection	Soil Standard for River Protection	Soil	Sediment	
Antimony	1.4	0.247 (<BG)	0.458 (<BG)	32	5 ^c	5 ^c	No	No	--
Arsenic	3	2.2	2.9	20 ^a	20 ^a	20 ^a	No	No	--
Barium	25	43.3 (<BG)	659	5,600	132 ^c	224	No	Yes	Yes ^d
Beryllium	790	0.597 (<BG)	1 (<BG)	10.4 ^c	1.51 ^c	1.51 ^c	No	No	--
Boron	3	1.3	130	16,000	320	-- ^f	No	No	--
Cadmium	30	U	0.082 (<BG)	13.9	0.81 ^c	0.81 ^c	No	No	--
Chromium (total)	200	7.9 (<BG)	6.8 (<BG)	80,000	18.5 ^c	18.5 ^c	No	No	--
Hexavalent chromium	0	0.308	0.281	2.1	4.8	2	No	No	--
Cobalt	50	5.2 (<BG)	5.2 (<BG)	1,600	32	-- ^f	No	No	--
Copper	22	11.4 (<BG)	29	2,960	59.2	22.0 ^c	No	Yes	Yes ^d
Lead	30	3.7 (<BG)	25.2	353	10.2 ^c	10.2 ^c	No	Yes	Yes ^d
Manganese	50	254 (<BG)	199 (<BG)	11,200	512 ^c	512 ^c	No	No	--
Mercury	30	0.33	0.508	24	0.33 ^c	0.33 ^c	No	Yes	Yes ^d
Molybdenum	20	0.442	1.4	400	8	-- ^f	No	No	--
Nickel	65	8.4 (<BG)	8 (<BG)	1,600	19.1 ^c	27.4	No	No	--
Selenium	150	U	0.59 (<BG)	400	5	1	No	No	--
Vanadium	1000	39.7 (<BG)	41.8 (<BG)	560	85.1 ^c	-- ^f	No	No	--
Zinc	30	42.4 (<BG)	72.6	24,000	480	67.8 ^c	No	Yes	Yes ^d
TPH ^j	50	U	125	-- ^f	200	200	No	No	--
Acenaphthene	4.9	U	0.080	4,800	96	129	No	No	--
Anthracene	23.5	U	0.128	24,000	240	1,920	No	No	--
Benzo(a)anthracene	360	U	0.509	1.37 ^g	0.33 ^h	0.33 ^h	No	Yes	Yes ^d
Benzo(a)pyrene	5500	U	0.472	0.33 ^h	0.33 ^h	0.33 ^h	No	Yes	No
Benzo(b)fluoranthene	880	U	0.398	1.37 ^g	0.33 ^h	0.33 ^h	No	Yes	Yes ^d
Benzo(g,h,i)perylene ⁱ	2680	U	0.099	2,400	48	192	No	No	--
Benzo(k)fluoranthene	2020	U	0.575	13.7 ^g	0.33 ^h	0.33 ^h	No	Yes	Yes ^d
Bis(2-ethylhexyl)phthalate	110	0.051	0.034	71.4	0.6	0.36	No	No	--
Carbazole	200	U	0.103	50	0.437	-- ^f	No	No	--
Chrysene	200	U	0.668	137 ^g	1.2 ^g	0.33 ^h	No	Yes	Yes ^d
Dibenzo(a,h)anthracene	1790	U	0.047	0.33 ^h	0.33 ^h	0.33 ^h	No	No	--
Dibenzofuran	11.3	U	0.018	160	3.2	-- ^f	No	No	--
Fluoranthene	49.1	U	1.35	3,200	64	18.0	No	No	--
Fluorene	7.71	U	0.051	3,200	64	260	No	No	--
Indeno(1,2,3-cd)pyrene	3470	U	0.118	1.37	0.33 ^g	0.33 ^g	No	No	--
Phenanthrene ⁱ	23.5	U	0.719	24,000	240	1,920	No	No	--
Pyrene	68	U	0.872	2,400	48	192	No	No	--

^a Lookup values and RAGs obtained from the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (100 Area RDR/RAWP) (DOE-RL 2005b) or calculated per WAC 173-340-720, WAC 173-340-730, and WAC 173-340-740, Method B, 1996, unless otherwise noted.

^b The 100 Area RDR/RAWP (DOE-RL 2005b) does not provide soil cleanup levels for this contaminant to be protective of groundwater and the Columbia River. Based on the soil partitioning distribution coefficient for cesium-137 of 50 mL/g, this contaminant is not predicted to migrate more than 1 m (3.3 ft) vertically in 1,000 years (BHI 2005a). The vadose zone underlying this pipeline site is at least 5 m (16 ft) thick. Therefore, residual concentration of this contaminant is predicted to be protective of groundwater and the Columbia River.

^c Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996).

^d Based on the *100 Area Analogous Sites RESRAD Calculations* (BHI 2005a), residual concentrations are not expected to migrate more than 3 m (10 ft) vertically in 1,000 years based on the lowest soil-partitioning coefficient of those contaminants that exceeded the RAG (copper; 22 mL/g). The vadose zone underlying the pipeline site is at least 5 m (16 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

^e Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) and an airborne particulate mass-loading rate of 0.0001 g/m³ (WDOH 1997).

Table 3. Comparison of Maximum Values to Action Levels for the 100-F-26:9 Pipeline Subsite: Service Area 2 Samples. (2 Pages)

- ^f No cleanup level is available from the Cleanup Levels and Risk Calculations database (Ecology 2005) and/or no bioconcentration factors or ambient water quality criteria values are available to calculate soil cleanup levels for river protection.
- ^g Cleanup level calculated with updated toxicity values using the appropriate formulas from WAC 173-340-740 (Ecology 1996). Updated toxicity values are available from the EPA Integrated Risk Information System at < <http://www.epa.gov/iris> > or from the Risk Assessment Information System database of the Oak Ridge National Laboratory on the Internet at < <http://risk.lsd.ornl.gov> >.
- ^h Where cleanup levels are less than the RDL, cleanup levels default to the RDL (WAC 173-340-707[2], 1996 and DOE-RL 2005b).
- ⁱ Toxicity data for this chemical are not available. Cleanup levels are based on the following surrogate chemicals: Contaminant: phenanthrene, surrogate: anthracene; benzo(g,h,i)perylene, surrogate: pyrene.
- ^j The soil cleanup value for TPH is from WAC 173-340-740(2), Table 2, "Method A Cleanup Levels – Soil," Ecology 1996, for diesel and other.
--	= not applicable	RDL	= required detection limit
BG	= background	RESRAD	= RESidual RADioactivity (dose model)
COPC	= contaminant of potential concern	U	= not detected
EPA	= U.S. Environmental Protection Agency	WAC	= <i>Washington Administrative Code</i>
RAG	= remedial action goal		

Service Area 3 (Test Pit 8)

The manhole to the junction box containing two 0.15 m (6-in.) VCPs was opened on January 11, 2005. This junction box received sanitary waste from the 105-F Reactor Building. There was not enough sediment in the bottom of the junction box to collect a sample (Figure 8). Test pit 8 was excavated on January 13, 2005. The 0.15 m (6-in.) VCP that exited the junction box was encased in concrete. A section of the pipe was removed and a soil sample (J02D75) was collected beneath it. The section of VCP pipe was broken into smaller pieces and sampled (J025K9, J02DD6) since there was not enough sediment in the pipe to collect a sample.

The soil and sediment sample results are discussed below. Table 4 provides a comparison of the maximum detected results for COPCs from underlying soil and junction box sediment samples collected from test pit 8 against the RAGs identified in the RDR/RAWP (DOE-RL 2005b) or against cleanup levels calculated in accordance with WAC 173-340, Method B.

Figure 8. 100-F-26:9 Test Pit 8.

**Table 4. Comparison of Maximum Values to Action Levels
for the 100-F-26:9 Pipeline Subsite: Service Area 3 Samples.**

COPC	Kd Value (mL/g)	Maximum Result (mg/kg)		Remedial Action Goals ^a (mg/kg)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Pipe	Direct Exposure	Soil Standard for Groundwater Protection	Soil Standard for River Protection	Soil	Sediment	
Antimony	1.4	0.499 (<BG)	0.42 (<BG)	32	5 ^b	5 ^b	No	No	--
Arsenic	3	2.6	2.2	20 ^a	20 ^a	20 ^a	No	No	--
Barium	25	94.8 (<BG)	125 (<BG)	5,600	132 ^b	224	No	No	--
Beryllium	790	0.474 (<BG)	0.17 (<BG)	10.4 ^c	1.51 ^b	1.51 ^b	No	No	--
Boron	3	2.6	13.6	16,000	320	-- ^d	No	No	--
Cadmium	30	0.064 (<BG)	0.9	13.9	0.81 ^b	0.81 ^b	No	Yes	Yes ^e
Chromium (total)	200	12.4 (<BG)	7.1 (<BG)	80,000	18.5 ^b	18.5 ^b	No	No	--
Cobalt	50	4.6 (<BG)	1.4 (<BG)	1,600	32	-- ^d	No	No	--
Copper	22	15.9 (<BG)	26.1	2,960	59.2	22.0 ^b	No	Yes	Yes ^e
Lead	30	4.6 (<BG)	17.8	353	10.2 ^b	10.2 ^b	No	Yes	Yes ^e
Manganese	50	193 (<BG)	94.5 (<BG)	11,200	512 ^b	512 ^b	No	No	--
Mercury	30	0.273 (<BG)	0.9	24	0.33 ^b	0.33 ^b	No	Yes	Yes ^e
Molybdenum	20	0.756	1	400	8	-- ^d	No	No	--
Nickel	65	9.1 (<BG)	4.2 (<BG)	1,600	19.1 ^b	27.4	No	No	--
Silver	90	0.099 (<BG)	0.13 (<BG)	400	8	0.73 ^b	No	No	--
Vanadium	1000	40.1 (<BG)	10.9 (<BG)	560	85.1 ^b	-- ^d	No	No	--
Zinc	30	62.8 (<BG)	359	24,000	480	67.8 ^c	No	Yes	Yes ^e
TPH ⁱ	50	U	76.3	-- ^d	200	200	No	No	--
Anthracene	23.5	U	0.069	24,000	240	1,920	No	No	--
Benzo(a)anthracene	360	U	0.360	1.37 ^f	0.33 ^g	0.33 ^g	No	No	Yes ^e
Benzo(a)pyrene	5500	U	0.290	0.33 ^g	0.33 ^g	0.33 ^g	No	No	--
Benzo(b)fluoranthene	880	U	0.280	1.37 ^f	0.33 ^g	0.33 ^g	No	No	--
Benzo(g,h,i)perylene ^h	2680	U	0.180	2,400	48	192	No	No	--
Benzo(k)fluoranthene	2020	U	0.290	13.7 ^f	0.33 ^g	0.33 ^g	No	No	--
Bis(2-ethylhexyl)phthalate	110	0.087	0.140	71.4	0.6	0.36	No	No	--
Butylbenzylphthalate	13.8	0.027	0.071	16,000	320	250	No	No	--
Carbazole	200	U	0.065	50	0.437	-- ^d	No	No	--
Chrysene	200	U	0.370	137 ^f	1.2 ^f	0.33 ^g	No	No	Yes ^e
Dibenzo(a,h)anthracene	1790	U	0.079	0.33 ^g	0.33 ^g	0.33 ^g	No	No	--
Di-n-butylphthalate	1.57	0.136	0.500	8,000	160	540	No	No	--
Fluoranthene	49.1	U	0.620	3,200	64	18.0	No	No	--
Indeno(1,2,3-cd)pyrene	3470	U	0.180	1.37	0.33 ^g	0.33 ^g	No	No	--
Phenanthrene ^h	23.5	U	0.220	24,000	240	1,920	No	No	--
Pyrene	68	U	0.470	2,400	48	192	No	No	--
Aroclor-1260	530	U	0.013	0.5	0.017 ^g	0.017 ^g	No	No	--

^a Lookup values and RAGs obtained from the 100 Area RDR/RAWP (DOE-RL 2005b) or calculated per WAC 173-340-720, WAC 173-340-730, and WAC 173-340-740, Method B, 1996, unless otherwise noted.

^b Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996).

^c Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) and an airborne particulate mass-loading rate of 0.0001 g/m³ (WDOH 1997).

^d No cleanup level is available from the Cleanup Levels and Risk Calculations database (Ecology 2005) and/or no bioconcentration factors or ambient water quality criteria values are available to calculate soil cleanup levels for river protection.

^e Based on the 100 Area Analogous Sites RESRAD Calculations (BHI 2005a), residual concentrations are not expected to migrate more than 3 m (10 ft) vertically in 1,000 years based on the lowest soil-partitioning coefficient of those contaminants that exceeded the RAG (copper; 22 mL/g). The vadose zone underlying the remediation footprint is approximately 5 m (16 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

^f Cleanup level calculated with updated toxicity values using the appropriate formulas from WAC 173-340-740 (Ecology 1996). Updated toxicity values are available from the EPA Integrated Risk Information System at < <http://www.epa.gov/iris> > or from the Risk Assessment Information System database of the Oak Ridge National Laboratory on the Internet at < <http://risk.lsd.ornl.gov> >.

^g Where cleanup levels are less than the RDL, cleanup levels default to the RDL (WAC 173-340-707[2], 1996 and DOE-RL 2005b).

^h Toxicity data for this chemical are not available. Cleanup levels are based on the following surrogate chemicals: Contaminant: phenanthrene, surrogate: anthracene; benzo(g,h,i)perylene, surrogate: pyrene.

ⁱ The soil cleanup value for TPH is from WAC 173-340-740(2), Table 2, "Method A Cleanup Levels - Soil," Ecology 1996, for diesel and other.

-- = not applicable

BG = background

COPC = contaminant of potential concern

EPA = U.S. Environmental Protection Agency

RAG = remedial action goal

RDL = required detection limit

RDR/RAWP

RESRAD = RESidual RADioactivity (dose model U = not detected)

WAC = Washington Administrative Code

Soil Sampling Results

No radionuclide constituents were detected in the soil sample from this test pit. No nonradionuclide constituents were detected at levels exceeding applicable RAGs.

Pipe Sampling Results

No radionuclide COPCs were detected in the pipe sample. All of the nonradionuclides detected in the pipe sample were quantified below their respective direct exposure RAGs. Cadmium, copper, lead, mercury, zinc, benzo(a)anthracene, and chrysene were detected at concentrations in excess of their respective groundwater and/or river protection lookup values. Each of these nonradionuclides was predicted to migrate less than 3 m (10 ft) vertically in 1,000 years based on their respective soil-partitioning coefficients. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

Service Area 4 (Test Pit 22)

Test pit 22 was excavated on January 13, 2005 (Figure 9). The 0.2 m (8-in.) VCP was encased in concrete. The pipe received sanitary waste from the 108-F Biology Laboratory. There was not enough sediment in the VCP to collect a sample. A section of the concrete encased VCP was removed and a soil sample (J02D76) was collected below it. The section of VCP was broken into smaller pieces and sampled (J02DD7, J025L0).

The soil and pipe sample results are discussed below. Table 5 provides a comparison of the maximum detected results for COPCs from underlying soil and junction box sediment samples collected from test pit 22 against the RAGs identified in the RDR/RAWP (DOE-RL 2005b) or against cleanup levels calculated in accordance with WAC 173-340, Method B.

Figure 9. 100-F-26:9 Test Pit 22.

**Table 5. Comparison of Maximum Values to Action Levels
for the 100-F-26:9 Pipeline Subsite: Service Area 4 Samples.**

COPC	Kd Value (mL/g)	Maximum Result (mg/kg)		Remedial Action Goals ^a (mg/kg)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Pipe	Direct Exposure	Soil Standard for Groundwater Protection	Soil Standard for River Protection	Soil	Sediment	
Antimony	1.4	U	1.3 (<BG)	32	5 ^b	5 ^b	No	No	--
Arsenic	3	2 (<BG)	11.7 (<BG)	20	20	20	No	No	--
Barium	25	57.7 (<BG)	57.9 (<BG)	5,600	132 ^b	224	No	No	--
Beryllium	790	0.475 (<BG)	0.21 (<BG)	10.4 ^c	1.51 ^b	1.51 ^b	No	No	--
Boron	3	4.2	16.7	16,000	320	-- ^d	No	No	--
Cadmium	30	0.06 (<BG)	0.12 (<BG)	13.9	0.81 ^b	0.81 ^b	No	No	--
Chromium (total)	200	9 (<BG)	3.9 (<BG)	80,000	18.5 ^b	18.5 ^b	No	No	--
Hexavalent chromium	0	0.253	U	2.1	4.8	2	No	No	--
Cobalt	50	4.7 (<BG)	1.9 (<BG)	1,600	32	-- ^d	No	No	--
Copper	22	11.8 (<BG)	10 (<BG)	2,960	59.2	22.0 ^b	No	No	--
Lead	30	3.1 (<BG)	23.5	353	10.2 ^b	10.2 ^b	No	Yes	Yes ^e
Manganese	50	233 (<BG)	73.6 (<BG)	11,200	512 ^b	512 ^b	No	No	--
Mercury	30	U	1.3	24	0.33 ^b	0.33 ^b	No	Yes	Yes ^e
Molybdenum	20	0.338	0.29	400	8	-- ^d	No	No	--
Nickel	65	9.9 (<BG)	3.2 (<BG)	1,600	19.1 ^b	27.4	No	No	--
Silver	90	U	0.27 (<BG)	400	8	0.73 ^b	No	No	--
Vanadium	1000	34.1 (<BG)	14.1 (<BG)	560	85.1 ^b	-- ^d	No	No	--
Zinc	30	29.9 (<BG)	79.4	24,000	480	67.8 ^b	No	Yes	Yes ^e
Benzo(a)anthracene	360	U	0.029	1.37 ^f	0.33 ^g	0.33 ^g	No	No	--
Benzo(a)pyrene	5500	U	0.024	0.33 ^g	0.33 ^g	0.33 ^g	No	No	--
Benzo(b)fluoranthene	880	U	0.033	1.37 ^f	0.33 ^g	0.33 ^g	No	No	--
Benzo(g,h,i)perylene ^h	2680	U	0.023	2,400	48	192	No	No	--
Benzo(k)fluoranthene	2020	U	0.021	13.7 ^f	0.33 ^g	0.33 ^g	No	No	--
Bis(2-ethylhexyl)phthalate	110	0.055	0.067	71.4	0.6	0.36	No	No	--
Chrysene	200	U	0.037	137 ^f	1.2 ^f	0.33 ^g	No	No	--
Di-n-butylphthalate	1.57	U	0.045	8,000	160	540	No	No	--
Fluoranthene	49.1	U	0.046	3,200	64	18.0	No	No	--
Indeno(1,2,3-cd) pyrene	3470	U	0.018	1.37	0.33 ^f	0.33 ^f	No	No	--
Pyrene	68	U	0.032	2,400	48	192	No	No	--

^a Lookup values and RAGs obtained from the 100 Area RDR/RAWP (DOE-RL 2005b) or calculated per WAC 173-340-720, WAC 173-340-730, and WAC 173-340-740, Method B, 1996, unless otherwise noted.

^b Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996).

^c Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) and an airborne particulate mass-loading rate of 0.0001 g/m³ (WDOH 1997).

^d No cleanup level is available from the Cleanup Levels and Risk Calculations database (Ecology 2005) and/or no bioconcentration factors or ambient water quality criteria values are available to calculate soil cleanup levels for river protection.

^e Based on the 100 Area Analogous Sites RESRAD Calculations (BHI 2005a), residual concentrations are not expected to migrate more than 2 m (6.6 ft) vertically in 1,000 years based on the lowest soil-partitioning coefficient (Kd value) of those contaminants that exceeded the RAG (lead, mercury and zinc all have Kd values of 30 mL/g). The vadose zone underlying the pipeline site is at least 5 m (16 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

^f Cleanup level calculated with updated toxicity values using the appropriate formulas from WAC 173-340-740 (Ecology 1996). Updated toxicity values are available from the EPA Integrated Risk Information System at < <http://www.epa.gov/iris> > or from the Risk Assessment Information System database of the Oak Ridge National Laboratory on the Internet at < <http://risk.lsd.ornl.gov> >.

^g Where cleanup levels are less than the RDL, cleanup levels default to the RDL (WAC 173-340-707[2], 1996 and DOE-RL 2005b).

^h Toxicity data for this chemical are not available. Cleanup levels are based on the following surrogate chemicals: Contaminant: benzo(g,h,i)perylene, surrogate: pyrene.

-- = not applicable

BG = background

COPC = contaminant of potential concern

EPA = U.S. Environmental Protection Agency

RAG = remedial action goal

RDL = required detection limit

RDR/RAWP = Remedial Design Report/Remedial Action Work Plan for the 100 Area

RESRAD = RESidual RADioactivity (dose model)

U = not detected

WAC = Washington Administrative Code

Soil Sampling Results

No radionuclide constituents were detected in the soil sample from this test pit. No nonradionuclide constituents were detected at levels exceeding applicable RAGs.

Pipe Sampling Results

No radionuclide COPCs were detected in the pipe sample from this test pit. Lead, mercury, and zinc were detected at concentrations exceeding RAGs for the protection of groundwater and/or the Columbia River. Each of these nonradionuclides were predicted to migrate less than 2 m (6.6 ft) vertically in 1,000 years based on their respective soil-partitioning coefficients; the underlying vadose zone is at least 5 m (16 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

Service Area 5 (Test Pit 28)

Test pit 28 was excavated January 3, 2005 (see Figure 10). A 10 cm (4-in) diameter cast iron pipe was discovered running in a north-south direction. The pipe location corresponds to a clean water service pipeline that was included in the rejected 100-F-41 waste site. The pipe was left in place as shown in Figure 10. The manhole to the junction box containing the 0.15 m (6-in.) VCP and two 0.2 m (8-in.) VCPs was opened to obtain a sediment sample (J026D2) from the bottom. This junction box received effluent from the sanitary sewer servicing buildings 1704-F, 1707-F, 1713-F, and 1719-F. A soil sample (J026D1) was collected from under the junction box. Test pit 28 was backfilled the same day.

The soil and sediment sample results are discussed below. Table 6 provides a comparison of the maximum detected results for COPCs from underlying soil and junction box sediment samples collected from test pit 28 against the RAGs identified in the RDR/RAWP (DOE-RL 2005b) or against cleanup levels calculated in accordance with WAC 173-340, Method B.

Figure 10. 100-F-26:9 Test Pit 28.

**Table 6. Comparison of Maximum Values to Action Levels for the 100-F-26:9 Pipeline
Subsite: Service Area 5 Samples. (2 Pages)**

COPC	Kd Value (mL/g)	Maximum Result (pCi/g)		Generic Site Lookup Values ^a (pCi/g)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Sediment	Shallow Zone Lookup Values	Groundwater Protection Lookup Values	River Protection Lookup Values	Soil	Sediment	
Cesium-137	50	U	0.219	6.2	-- ^f	-- ^f	No	No	--
COPC	Kd Value (mL/g)	Maximum Result (mg/kg)		Remedial Action Goals ^a (mg/kg)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Sediment	Direct Exposure	Soil Standard for Groundwater Protection	Soil Standard for River Protection	Soil	Sediment	
Antimony	1.4	0.311 (<BG)	0.42 (<BG)	32	5 ^c	5 ^c	No	No	--
Arsenic	3	2.3	3.1	20 ^a	20 ^a	20 ^a	No	No	--
Barium	25	23 (<BG)	198	5,600	132 ^c	224	No	Yes	Yes ^d
Beryllium	790	0.373 (<BG)	0.676 (<BG)	10.4 ^c	1.51 ^c	1.51 ^c	No	No	--
Boron	3	0.288	11.5	16,000	320	-- ^f	No	No	--
Cadmium	30	U	0.283 (<BG)	13.9	0.81 ^c	0.81 ^c	No	No	--
Chromium (total)	200	7.1 (<BG)	17.3 (<BG)	80,000	18.5 ^c	18.5 ^c	No	No	--
Hexavalent chromium	0	U	0.527	2.1	4.8	2	No	No	--
Cobalt	50	4 (<BG)	6.6 (<BG)	1,600	32	-- ^f	No	No	--
Copper	22	12 (<BG)	33.6	2,960	59.2	22.0 ^c	No	Yes	Yes ^d
Lead	30	2.8 (<BG)	62.7	353	10.2 ^c	10.2 ^c	No	Yes	Yes ^d
Manganese	50	186 (<BG)	244 (<BG)	11,200	512 ^c	512 ^c	No	No	--
Mercury	30	U	10.5	24	0.33 ^c	0.33 ^c	No	Yes	Yes ^d
Molybdenum	20	0.379	1.6	400	8	-- ^f	No	No	--
Nickel	65	9 (<BG)	39.4	1,600	19.1 ^c	27.4	No	Yes	Yes ^d
Silver	90	U	0.862	400	8	0.73 ^c	No	Yes	Yes ^d
Vanadium	1000	26.3 (<BG)	32.5 (<BG)	560	85.1 ^c	-- ^f	No	No	--
Zinc	30	23.8 (<BG)	93.4	24,000	480	67.8 ^c	No	Yes	Yes ^d
TPH ¹	50	U	165	-- ^f	200	200	No	No	--
Acenaphthylene ^g	6.12	U	0.022	4,800	96	129	No	No	--
Anthracene	23.5	U	0.019	24,000	240	1,920	No	No	--
Benzo(a)anthracene	360	U	0.041	1.37 ^h	0.33 ⁱ	0.33 ⁱ	No	No	--
Benzo(a)pyrene	5500	U	0.039	0.33 ⁱ	0.33 ⁱ	0.33 ⁱ	No	No	--
Benzo(b)fluoranthene	880	U	0.065	1.37 ^h	0.33 ⁱ	0.33 ⁱ	No	No	--
Benzo(k)fluoranthene	2020	U	0.062	13.7 ^h	0.33 ⁱ	0.33 ⁱ	No	No	--
Bis(2-ethylhexyl)phthalate	110	0.018	0.456	71.4	0.6	0.36	No	Yes	Yes ^d
Chrysene	200	U	0.076	137 ^h	1.2 ^h	0.33 ⁱ	No	No	--
Fluoranthene	49.1	U	0.122	3,200	64	18.0	No	No	--
Phenanthrene ^g	23.5	U	0.040	24,000	240	1,920	No	No	--
Phenol	0.0288	U	0.066	24,000	480	4,200	No	No	--
Pyrene	68	U	0.077	2,400	48	192	No	No	--
Aroclor-1254	75.6	U	0.180	0.5	0.017 ^a	0.017 ^a	No	Yes	Yes ^u

^a Lookup values and RAGs obtained from the 100 Area RDR/RAWP (DOE-RL 2005b) or calculated per WAC 173-340-720, WAC 173-340-730, and WAC 173-340-740, Method B, 1996, unless otherwise noted.

^b The 100 Area RDR/RAWP (DOE-RL 2005b) does not provide soil cleanup levels for this contaminant to be protective of groundwater and the Columbia River. Based on the soil partitioning distribution coefficient for cesium-137 of 50 mL/g, this contaminant is not predicted to migrate more than 1 m (3.3 ft) vertically in 1,000 years (BHI 2005a). The vadose zone underlying this pipeline site is at least 5 m (16 ft) thick. Therefore, residual concentration of this contaminant is predicted to be protective of groundwater and the Columbia River.

^c Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996).

^d Based on the 100 Area Analogous Sites RESRAD Calculations (BHI 2005a), residual concentrations are not expected to migrate more than 3 m (10 ft) vertically in 1,000 years based on the lowest soil-partitioning coefficient of those contaminants that exceeded the RAG (copper; 22 mL/g). The vadose zone underlying the remediation footprint is approximately 5 m (16 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

^e Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) and an airborne particulate mass-loading rate of 0.0001 g/m³ (WDOH 1997).

^f No cleanup level is available from the Cleanup Levels and Risk Calculations database (Ecology 2005) and/or no bioconcentration factors or ambient water quality criteria values are available to calculate soil cleanup levels for river protection.

**Table 6. Comparison of Maximum Values to Action Levels for the 100-F-26:9 Pipeline
Subsite: Service Area 5 Samples. (2 Pages)**

- ^g Toxicity data for this chemical are not available. Cleanup levels are based on the following surrogate chemicals: Contaminant: acenaphthylene, surrogate: acenaphthene; phenanthrene, surrogate: anthracene.
- ^h Cleanup level calculated with updated toxicity values using the appropriate formulas from WAC 173-340-740 (Ecology 1996). Updated toxicity values are available from the EPA Integrated Risk Information System at < <http://www.epa.gov/iris> > or from the Risk Assessment Information System database of the Oak Ridge National Laboratory on the Internet at < <http://risk.lsd.ornl.gov> >.
- ⁱ Where cleanup levels are less than the RDL, cleanup levels default to the RDL (WAC 173-340-707[2], 1996 and DOE-RL 2005b).
- ^j The soil cleanup value for TPH is from WAC 173-340-740(2), Table 2, "Method A Cleanup Levels – Soil," Ecology 1996, for diesel and other.
- = not applicable
 BG = background
 COPC = contaminant of potential concern
 EPA = U.S. Environmental Protection Agency
 RAG = remedial action goal
 RDL = required detection limit
 RDR/RAWP = Remedial Design Report/Remedial Action Work Plan for the 100 Area
 RESRAD = RESidual RADioactivity (dose model)
 TPH = total petroleum hydrocarbon
 U = not detected
 WAC = Washington Administrative Code

Soil Sampling Results

No radionuclide constituents were detected in the soil sample from this test pit. No nonradionuclide constituents were detected at levels exceeding applicable RAGs.

Pipe Sediment Sampling Results

Cesium-137 was the only radionuclide constituent detected in the sediment sample from this test pit. It was quantified below its single-radionuclide 15 mrem/yr dose-equivalence lookup value. No nonradionuclides were detected in the pipe sediment at levels exceeding direct exposure RAGs. Cesium-137 is predicted to migrate less than 1 m (3.3 ft) vertically in 1,000 years based on its soil-partitioning coefficients. Therefore, the residual concentration of cesium-137 is predicted to be protective of groundwater and the Columbia River.

No nonradionuclides were detected in the pipe sediment at levels exceeding direct exposure RAGs. Barium, copper, lead, mercury, nickel, silver, zinc, bis(2-ethylhexyl)phthalate and Aroclor-1254 were detected at concentrations exceeding RAGs for the protection of groundwater and the Columbia River. Each of these nonradionuclides were predicted to migrate less than 3 m (10 ft) vertically in 1,000 years based on their respective soil-partitioning coefficients. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

Service Area 6 (Test Pit 40)

The manhole to the junction box containing the 0.15 m (6-in.) VCP and three 0.2 m (8-in.) VCPs was opened on December 28, 2004. This junction box received effluent from service areas 7 and 10. Sediment (J025J6) was collected from the bottom of the junction box approximately 3.2 m (11 ft) below the ground surface (bgs). Test pit 40 was excavated on December 28, 2004 (see Figure 11). The 0.2 m (8-in.) VCP that exited the junction box was encased in concrete. A soil sample (J025J7) was collected under the pipe.

Figure 11. 100-F-26:9 Test Pit 40.

The soil and sediment sample results are discussed below. Table 7 provides a comparison of the maximum detected results for COPCs from underlying soil and junction box sediment samples collected from test pit 40 against the RAGs identified in the RDR/RAWP (DOE-RL 2005b) or against cleanup levels calculated in accordance with WAC 173-340, Method B.

Soil Sampling Results

No radionuclide constituents were detected in the soil sample from this test pit. No nonradionuclide constituents were detected at levels exceeding applicable RAGs.

Pipe Sediment Sampling Results

No radionuclide constituents were detected in the sediment sample from this test pit. No nonradionuclides were detected in the pipe sediment at levels exceeding direct exposure RAGs. Aroclor-1260 was detected at a concentration exceeding the RAG for the protection of the Columbia River. Aroclor-1260 was predicted to migrate less than 2 m (6.6 ft) vertically in 1,000 years based on its soil-partitioning coefficient. Therefore, the residual concentration of Aroclor-1260 is predicted to be protective of groundwater and the Columbia River. All other nonradionuclide constituents were not detected at levels exceeding applicable RAGs.

**Table 7. Comparison of Maximum Values to Action Levels
for the 100-F-26:9 Pipeline Subsite: Service Area 6 Samples.**

COPC	Kd Value (mL/g)	Maximum Result (mg/kg)		Remedial Action Goals ^a (mg/kg)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Sediment	Direct Exposure	Soil Standard for Groundwater Protection	Soil Standard for River Protection	Soil	Sediment	
Arsenic	3	1.9	1.1	20 ^a	20 ^a	20 ^a	No	No	--
Barium	25	44 (<BG)	82.2 (<BG)	5,600	132 ^b	224	No	No	--
Beryllium	790	0.36 (<BG)	0.43 (<BG)	10.4 ^c	1.51 ^b	1.51 ^b	No	No	--
Boron	3	0.61	4.1	16,000	320	-- ^d	No	No	--
Chromium (total)	200	9.7 (<BG)	6 (<BG)	80,000	18.5 ^b	18.5 ^b	No	No	--
Hexavalent chromium	0	U	0.26	2.1	4.8	2	No	No	--
Cobalt	50	4.3 (<BG)	4.4 (<BG)	1,600	32	-- ^d	No	No	--
Copper	22	11.6 (<BG)	12.5 (<BG)	2,960	59.2	22.0 ^b	No	No	--
Lead	30	2.8 (<BG)	4.8 (<BG)	353	10.2 ^b	10.2 ^b	No	No	--
Manganese	50	230 (<BG)	185 (<BG)	11,200	512 ^b	512 ^b	No	No	--
Mercury	30	0.1 (<BG)	U	24	0.33 ^b	0.33 ^b	No	No	--
Molybdenum	20	U	0.33	400	8	-- ^d	No	No	--
Nickel	65	10.1 (<BG)	6.2 (<BG)	1,600	19.1 ^b	27.4	No	No	--
Vanadium	1000	30 (<BG)	35.9 (<BG)	560	85.1 ^b	-- ^d	No	No	--
Zinc	30	35.2 (<BG)	30.7 (<BG)	24,000	480	67.8 ^b	No	No	--
TPH ^e	50	U	75.4	-- ^d	200	200	No	No	--
Bis(2-ethylhexyl)phthalate	110	0.049	0.030	71.4	0.6	0.36	No	No	--
Butylbenzylphthalate	13.8	0.048	U	16,000	320	250	No	No	--
Diethylphthalate	0.082	0.034	U	64,000	1,280	4,600	No	No	--
Di-n-butylphthalate	1.57	0.036	U	8,000	160	540	No	No	--
Aroclor-1260	530	U	0.028	0.5	0.017 ^e	0.017 ^e	No	Yes	Yes ^f

^a Lookup values and RAGs obtained from the 100 Area RDR/RAWP (DOE-RL 2005b) or calculated per WAC 173-340-720, WAC 173-340-730, and WAC 173-340-740, Method B, 1996, unless otherwise noted.

^b Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996).

^c Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) and an airborne particulate mass-loading rate of 0.0001 g/m³ (WDOH 1997).

^d No cleanup level is available from the Cleanup Levels and Risk Calculations database (Ecology 2005) and/or no bioconcentration factors or ambient water quality criteria values are available to calculate soil cleanup levels for river protection.

^e Where cleanup levels are less than the RDL, cleanup levels default to the RDL (WAC 173-340-707[2], 1996 and DOE-RL 2005b).

^f Based on the 100 Area Analogous Sites RESRAD Calculations (BHI 2005a), residual concentrations are not expected to migrate more than 1 m (3.3 ft) vertically in 1,000 years (based on the soil-partitioning coefficient for aroclor-1260 of 530 mL/g). The vadose zone underlying the remediation footprint is approximately 5 m (16 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

^g The soil cleanup value for TPH is from WAC 173-340-740(2), Table 2, "Method A Cleanup Levels – Soil," Ecology 1996, for diesel and other.

-- = not applicable

BG = background

COPC = contaminant of potential concern

RAG = remedial action goal

RDL = required detection limit

RDR/RAWP = Remedial Design Report/Remedial Action Work Plan for the 100 Area

RESRAD = RESidual RADioactivity (dose model)

TPH = total petroleum hydrocarbon

U = not detected

WAC = Washington Administrative Code

Service Area 7 (Test Pit 24)

Test pit 24 was excavated on December 27, 2004 (see Figure 12). The 0.15 m (6-in.) VCP was encased in concrete. There was not enough sediment in the VCP to collect a sample. A section of the concrete encased VCP was removed and set aside for sampling at a later date. A soil sample (J025J25) was collected below the section of pipe that was removed. The section of VCP pipe was broken into smaller pieces and sampled (J025K8, J025M4) on January 10, 2005.

Figure 12. 100-F-26:9 Test Pit 24.

The soil and pipe sample results are discussed below. Table 8 provides a comparison of the maximum detected results for COPCs from underlying soil and junction box sediment samples collected from test pit 24 against the RAGs identified in the RDR/RAWP (DOE-RL 2005b) or against cleanup levels calculated in accordance with WAC 173-340, Method B.

Soil Sampling Results

Cesium-137 was the only radionuclide constituent detected in the soil sample from this test pit. It was quantified below its single-radionuclide 15 mrem/yr dose-equivalence lookup value. No nonradionuclides were detected in the pipe sediment at levels exceeding direct exposure RAGs. Cesium-137 is predicted to migrate less than 1 m (3.3 ft) vertically in 1,000 years based on its soil-partitioning coefficients. Therefore, the residual concentration of cesium-137 is predicted to be protective of groundwater and the Columbia River.

No nonradionuclides were detected in the pipe sediment at levels exceeding direct exposure RAGs. Barium, lead, mercury, zinc, and Aroclor-1254 were detected at concentrations exceeding RAGs for the protection of groundwater and the Columbia River. Each of these nonradionuclides were predicted to migrate less than 2 m (6.6 ft) vertically in 1,000 years based on their respective soil-partitioning coefficients. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

**Table 8. Comparison of Maximum Values to Action Levels
for the 100-F-26:9 Pipeline Subsite: Service Area 7 Samples.**

COPC	Kd Value (mL/g)	Maximum Result (pCi/g)		Generic Site Lookup Values ^a (pCi/g)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Pipe	Shallow Zone Lookup Values	Groundwater Protection Lookup Values	River Protection Lookup Values	Soil	Sediment	
Cesium-137	50	0.172	U	6.2	-- ^g	-- ^g	No	No	--
COPC	Kd Value (mL/g)	Maximum Result (mg/kg)		Remedial Action Goals ^a (mg/kg)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Pipe	Direct Exposure	Soil Standard for Groundwater Protection	Soil Standard for River Protection	Soil	Sediment	
Antimony	1.4	0.38 (<BG)	1 (<BG)	32	5 ^c	5 ^c	No	No	--
Arsenic	3	2.4	2	20 ^a	20 ^a	20 ^a	No	No	--
Barium	25	133	81.9 (<BG)	5,600	132 ^c	224	Yes	No	Yes ^d
Beryllium	790	0.5 (<BG)	0.21 (<BG)	10.4 ^e	1.51 ^c	1.51 ^c	No	No	--
Boron	3	2.7	7.5	16,000	320	-- ^f	No	No	--
Cadmium	30	0.34 (<BG)	1.8	13.9	0.81 ^c	0.81 ^c	No	Yes	Yes ^d
Chromium (total)	200	17 (<BG)	30	80,000	18.5 ^c	18.5 ^c	No	Yes	Yes ^d
Cobalt	50	5.3 (<BG)	2.6 (<BG)	1,600	32	-- ^f	No	No	--
Copper	22	20 (<BG)	48.6	2,960	59.2	22.0 ^c	No	Yes	Yes ^d
Lead	30	13	131	353	10.2 ^c	10.2 ^c	Yes	Yes	Yes ^d
Manganese	50	250 (<BG)	85.6 (<BG)	11,200	512 ^c	512 ^c	No	No	--
Mercury	30	0.81	15.4	24	0.33 ^c	0.33 ^c	Yes	Yes	Yes ^d
Molybdenum	20	0.51	0.95	400	8	-- ^f	No	No	--
Nickel	65	10.2 (<BG)	17.2 (<BG)	1,600	19.1 ^c	27.4	No	No	--
Silver	90	0.13 (<BG)	1.2	400	8	0.73 ^c	No	Yes	Yes ^d
Vanadium	1000	39.1 (<BG)	12.8 (<BG)	560	85.1 ^c	-- ^f	No	No	--
Zinc	30	122	140	24,000	480	67.8 ^c	Yes	Yes	Yes ^d
TPH ⁱ	50	U	39.9	-- ^f	200	200	No	No	--
Bis(2-ethylhexyl)phthalate	110	0.061	0.330	71.4	0.6	0.36	No	No	--
Di-n-butylphthalate	1.57	0.023	0.230	8,000	160	540	No	No	--
Aroclor-1254	75.6	0.19	0.550	0.5	0.017 ^g	0.017 ^g	Yes	Yes	Yes ^{u,i}

^a Lookup values and RAGs obtained from the 100 Area RDR/RAWP (DOE-RL 2005b) or calculated per WAC 173-340-720, WAC 173-340-730, and WAC 173-340-740, Method B, 1996, unless otherwise noted.

^b The 100 Area RDR/RAWP (DOE-RL 2005b) does not provide soil cleanup levels for this contaminant to be protective of groundwater and the Columbia River. Based on the soil partitioning distribution coefficient for cesium-137 of 50 mL/g, this contaminant is not predicted to migrate more than 1 m (3.3 ft) vertically in 1,000 years (BHI 2005a). The vadose zone underlying this pipeline site is at least 5 m (16 ft) thick. Therefore, residual concentration of this contaminant is predicted to be protective of groundwater and the Columbia River.

^c Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996).

^d Based on the 100 Area Analogous Sites RESRAD Calculations (BHI 2005a), residual concentrations are not expected to migrate more than 3 m (9.8 ft) vertically in 1,000 years based on the lowest soil-partitioning coefficient of those contaminants that exceeded the RAG (copper; 22 L/g). The vadose zone underlying the remediation footprint is approximately 5 m (16 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

^e Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) and an airborne particulate mass-loading rate of 0.0001 g/m³ (WDOH 1997).

^f No cleanup level is available from the Cleanup Levels and Risk Calculations database (Ecology 2005) and/or no bioconcentration factors or ambient water quality criteria values are available to calculate soil cleanup levels protective of the river.

^g Where cleanup levels are less than the RDL, cleanup levels default to the RDL (WAC 173-340-707[2], 1996 and DOE-RL 2005b).

^h The individual carcinogenic risk from direct exposure to Aroclor-1254 was calculated using a site-specific area factor for soil ingestion pathway (from DOE-RL 1995). The calculation determined that the mass of contamination was too small to cause a direct exposure risk of greater than 10⁻⁶ (refer to calc. no. 0100-F-CA-V0363). Calculations are provided in Appendix C.

ⁱ The soil cleanup value for TPH is from WAC 173-340-740(2), Table 2, "Method A Cleanup Levels – Soil," Ecology 1996, for diesel and other.

-- = not applicable

BG = background

COPC = contaminant of potential concern

RAG = remedial action goal

RDL = required detection limit

RDR/RAWP = Remedial Design Report/Remedial Action Work Plan for the 100 Area

RESRAD = RESidual RADioactivity (dose model)

TPH = total petroleum hydrocarbon

U = not detected

WAC = Washington Administrative Code

Pipe Sampling Results

No radionuclide COPCs were detected in the pipe sample. All of the nonradionuclides detected in the pipe with the exception of Aroclor-1254, were quantified below their respective direct exposure RAGs. A site-specific risk assessment (see calculation number 0100F-CA-V0363) was performed to determine that the measured concentration of Aroclor-1254 in the pipe sample represented a direct exposure risk of less than 1×10^{-6} and thus is protective of human health. The contaminated zone was assumed to have an area of 11.7 m^2 (125.9 ft^2). This was based on a conservative assumption of the contaminated area being 1 m (3.3 ft) wide along the length of the pipeline. Cadmium, chromium, copper, lead, mercury, silver, zinc, and Aroclor-1254 were detected at concentrations in excess of their respective groundwater and/or river protection lookup values. Each of these nonradionuclides was predicted to migrate less than 3 m (10 ft) vertically in 1,000 years based on their respective soil-partitioning coefficients. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

Service Area 8 (Test Pit 25)

Test pit 25 was excavated on December 28, 2004 (Figure 13). The 0.15 m (6-in.) VCP was covered but not completely encased in concrete. There was not enough sediment in the VCP to collect a sample. A piece of the concrete embedded VCP was removed, broken into smaller pieces, and sampled (J025P9, J025L8). A soil sample (J025J8) was collected below the section of pipe that was removed.

Figure 13. 100-F-26:9 Test Pit 25.

The soil and pipe sample results are discussed below. Table 9 provides a comparison of the maximum detected results for COPCs from underlying soil and junction box sediment samples collected from test pit 25 against the RAGs identified in the RDR/RAWP (DOE-RL 2005b) or against cleanup levels calculated in accordance with WAC 173-340, Method B.

Soil Sampling Results

No radionuclide constituents were detected in the soil sample from this test pit. No nonradionuclide constituents were detected at levels exceeding applicable RAGs.

Table 9. Comparison of Maximum Values to Action Levels for the 100-F-26:9 Pipeline Subsite: Service Area 8 Samples.

COPC	Kd Value (mL/g)	Maximum Result (mg/kg)		Remedial Action Goals ^a (mg/kg)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Pipe	Direct Exposure	Soil Standard for Groundwater Protection	Soil Standard for River Protection	Soil	Sediment	
Antimony	1.4	0.28 (<BG)	0.37 (<BG)	32	5 ^b	5 ^b	No	No	--
Arsenic	3	2.1 (<BG)	1.7 (<BG)	20	20	20	No	No	--
Barium	25	37.9 (<BG)	105 (<BG)	5,600	132 ^b	224	No	No	--
Beryllium	790	0.38 (<BG)	0.07 (<BG)	10.4 ^c	1.51 ^b	1.51 ^b	No	No	--
Boron	3	1.9	7.2	16,000	320	-- ^d	No	No	--
Cadmium	30	U	0.04 (<BG)	13.9	0.81 ^b	0.81 ^b	No	No	--
Chromium (total)	200	8.9 (<BG)	3.6 (<BG)	80,000	18.5 ^b	18.5 ^b	No	No	--
Hexavalent chromium	0	0.34	U	2.1	4.8	2	No	No	--
Cobalt	50	4.4 (<BG)	0.88 (<BG)	1,600	32	-- ^d	No	No	--
Copper	22	11.7 (<BG)	10.4 (<BG)	2,960	59.2	22.0 ^b	No	No	--
Lead	30	2.2 (<BG)	156	353	10.2 ^b	10.2 ^b	No	Yes	Yes ^e
Manganese	50	217 (<BG)	39.7 (<BG)	11,200	512 ^b	512 ^b	No	No	--
Mercury	30	U	0.3 (<BG)	24	0.33 ^b	0.33 ^b	No	No	--
Molybdenum	20	0.25	0.69	400	8	-- ^d	No	No	--
Nickel	65	9.3 (<BG)	3.3 (<BG)	1,600	19.1 ^b	27.4	No	No	--
Silver	90	U	0.11 (<BG)	400	8	0.73 ^b	No	No	--
Vanadium	1000	34.8 (<BG)	8.3 (<BG)	560	85.1 ^b	-- ^d	No	No	--
Zinc	30	32 (<BG)	37.2 (<BG)	24,000	480	67.8 ^b	No	No	--
Bis(2-ethylhexyl)phthalate	110	0.031	0.11	71.4	0.6	0.36	No	No	--
Butylbenzylphthalate	13.8	0.049	0.039	16,000	320	250	No	No	--
Diethylphthalate	0.082	0.031	0.030	64,000	1,280	4,600	No	No	--

^a Lookup values and RAGs obtained from the 100 Area RDR/RAWP (DOE-RL 2005b) or calculated per WAC 173-340-720, WAC 173-340-730, and WAC 173-340-740, Method B, 1996, unless otherwise noted.

^b Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996).

^c Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) and an airborne particulate mass-loading rate of 0.0001 g/m³ (WDOH 1997).

^d No cleanup level is available from the Cleanup Levels and Risk Calculations database (Ecology 2005) and/or no bioconcentration factors or ambient water quality criteria values are available to calculate soil cleanup levels for river protection.

^e Based on the 100 Area Analogous Sites RESRAD Calculations (BHI 2005a), residual concentrations are not expected to migrate more than 2 m (6.6 ft) vertically in 1,000 years (based on the soil-partitioning coefficient for lead of 30 mL/g). The vadose zone underlying the remediation footprint is approximately 5 m (16 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

-- = not applicable

BG = background

COPC = contaminant of potential concern

RAG = remedial action goal

RDR/RAWP = Remedial Design Report/Remedial Action Work Plan for the 100 Area

RESRAD = RESidual RADioactivity (dose model)

U = not detected

WAC = Washington Administrative Code

Pipe Sampling Results

No radionuclide constituents were detected in the pipe sample from this test pit. No nonradionuclides were detected in the pipe sediment at levels exceeding direct exposure RAGs. Lead was detected at a concentration exceeding the RAG for the protection of groundwater and the Columbia River. Lead was predicted to migrate less than 2 m (6.6 ft) vertically in 1,000 years based on its soil-partitioning coefficient. Therefore, the residual concentration of lead is predicted to be protective of groundwater and the Columbia River. All other nonradionuclide constituents were not detected at levels exceeding applicable RAGs.

Service Area 9 (Test Pit 27)

Test pit 27 was excavated December 30, 2004 (see Figure 14). The junction box did not have a manhole. This junction box received effluent from the sanitary sewer servicing the 184-F Power House. A section of the 0.15 m (6-in.) VCP encased concrete was removed on January 6, 2005. A sediment sample (J025K6) was collected from inside the pipe. A soil sample (J026D4) was collected from under the junction box.

The soil and sediment sample results are discussed below. Table 10 provides a comparison of the maximum detected results for COPCs from underlying soil and junction box sediment samples collected from test pit 27 against the RAGs identified in the RDR/RAWP (DOE-RL 2005b) or against cleanup levels calculated in accordance with WAC 173-340, Method B.

Figure 14. 100-F-26:9 Test Pit 27.

**Table 10. Comparison of Maximum Values to Action Levels for the 100-F-26:9 Pipeline
Subsite: Service Area 9 Samples.**

COPC	Kd Value (mL/g)	Maximum Result (pCi/g)		Generic Site Lookup Values ^a (pCi/g)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Sediment	Shallow Zone Lookup Values	Groundwater Protection Lookup Values	River Protection Lookup Values	Soil	Sediment	
Cesium-137	50	U	0.159	6.2	-- ^o	-- ^o	No	No	--
COPC	Kd Value (mL/g)	Maximum Result (mg/kg)		Remedial Action Goals ^a (mg/kg)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Sediment	Direct Exposure	Soil Standard for Groundwater Protection	Soil Standard for River Protection	Soil	Sediment	
Antimony	1.4	U	8.2	32	5 ^c	5 ^c	No	Yes	No
Arsenic	3	2.4	12.6	20 ^a	20 ^a	20 ^a	No	No	--
Barium	25	62.7 (<BG)	1,160	5,600	132 ^c	224	No	Yes	Yes ^d
Beryllium	790	0.515 (<BG)	0.589 (<BG)	10.4 ^c	1.51 ^c	1.51 ^c	No	No	--
Boron	3	2.4	58.7	16,000	320	-- ^f	No	No	--
Cadmium	30	U	167	13.9	0.81 ^c	0.81 ^c	No	Yes	No
Chromium (total)	200	8.7 (<BG)	27.9	80,000	18.5 ^c	18.5 ^c	No	Yes	Yes ^d
Cobalt	50	5.4 (<BG)	7.8 (<BG)	1,600	32	-- ^f	No	No	--
Copper	22	13.5 (<BG)	415	2,960	59.2	22.0 ^c	No	Yes	Yes ^d
Lead	30	5.7 (<BG)	3,750	353	10.2 ^c	10.2 ^c	No	Yes	No
Manganese	50	262 (<BG)	336 (<BG)	11,200	512 ^c	512 ^c	No	No	--
Mercury	30	0.223 (<BG)	481	24	0.33 ^c	0.33 ^c	No	Yes	No
Molybdenum	20	0.459	9.6	400	8	-- ^f	No	Yes	Yes ^d
Nickel	65	10.3 (<BG)	51.7	1,600	19.1 ^c	27.4	No	Yes	Yes ^d
Selenium	150	U	1.3	400	5	1	No	Yes	Yes ^d
Silver	90	U	7.1	400	8	0.73 ^c	No	Yes	Yes ^d
Vanadium	1000	37.9 (<BG)	46.3 (<BG)	560	85.1 ^c	-- ^f	No	No	--
Zinc	30	34.2 (<BG)	2,090	24,000	480	67.8 ^c	No	Yes	Yes ^d
TPH ^h	50	U	1,780	-- ^f	200	200	No	Yes	Yes ^d
Bis(2-ethylhexyl)phthalate	110	0.027	0.250	71.4	0.6	0.36	No	No	--
Di-n-butylphthalate	1.57	U	0.114	8,000	160	540	No	No	--
Pentachlorophenol	0.592	U	0.335	8.33	0.33 ^g	0.33 ^g	No	Yes	No
Aroclor-1254	75.6	U	0.810	0.5	0.017 ^g	0.017 ^g	No	Yes	No

^a Lookup values and RAGs obtained from the 100 Area RDR/RAWP (DOE-RL 2005b) or calculated per WAC 173-340-720, WAC 173-340-730, and WAC 173-340-740, Method B, 1996, unless otherwise noted.

^b The 100 Area RDR/RAWP (DOE-RL 2005b) does not provide soil cleanup levels for this contaminant to be protective of groundwater and the Columbia River. Based on the soil partitioning distribution coefficient for cesium-137 of 50 mL/g, this contaminant is not predicted to migrate more than 1 m (3.3 ft) vertically in 1,000 years (BHI 2005a). The vadose zone underlying this pipeline site is at least 5 m (16 ft) thick. Therefore, residual concentration of this contaminant is predicted to be protective of groundwater and the Columbia River.

^c Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996).

^d Based on the 100 Area Analogous Sites RESRAD Calculations (BHI 2005a), residual concentrations are not expected to migrate more than 3 m (9.8 ft) vertically in 1,000 years based on the lowest soil-partitioning coefficient of those contaminants that exceeded the RAG (molybdenum; 20 mL/g). The vadose zone underlying the remediation footprint is approximately 5 m (16 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

^e Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) and an airborne particulate mass-loading rate of 0.0001 g/m³ (WDOH 1997).

^f No cleanup level is available from the Cleanup Levels and Risk Calculations database (Ecology 2005) and/or no bioconcentration factors or ambient water quality criteria values are available to calculate soil cleanup levels protective of the river.

^g Where cleanup levels are less than the RDL, cleanup levels default to the RDL (WAC 173-340-707[2], 1996 and DOE-RL 2005b).

^h The soil cleanup value for TPH is from WAC 173-340-740(2), Table 2, "Method A Cleanup Levels – Soil," Ecology 1996, for diesel and other.

-- = not applicable

BG = background

COPC = contaminant of potential concern

RAG = remedial action goal

RDL = required detection limit

RDR/RAWP = Remedial Design Report/Remedial Action Work Plan for the 100 Area

RESRAD = RESidual RADioactivity (dose model)

TPH = total petroleum hydrocarbon

U = not detected

WAC = Washington Administrative Code

Soil Sampling Results

No radionuclide constituents were detected in the soil sample from this test pit. No nonradionuclide constituents were detected at levels exceeding applicable RAGs.

Pipe Sediment Sampling Results

Cesium-137 was the only radionuclide constituent detected in the sediment sample from this test pit. It was quantified below its single-radionuclide 15 mrem/yr dose-equivalence lookup value. No nonradionuclides were detected in the pipe sediment at levels exceeding direct exposure RAGs. Cesium-137 is predicted to migrate less than 1 m (3.3 ft) vertically in 1,000 years based on its soil-partitioning coefficient. Therefore, the residual concentration of cesium-137 is predicted to be protective of groundwater and the Columbia River.

Cadmium, lead, mercury, and Aroclor-1254 were detected in the sediment at levels exceeding direct exposure RAGs. In addition to these contaminants, antimony, barium, chromium, copper, molybdenum, nickel, selenium, silver, zinc, TPH, and pentachlorophenol were detected at concentrations exceeding RAGs for the protection of groundwater and the Columbia River. Each of these nonradionuclides, with the exception of antimony and pentachlorophenol, were predicted to migrate less than 2 m (6.6 ft) vertically in 1,000 years based on their respective soil-partitioning coefficients. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River. A site-specific risk assessment was not performed to determine whether antimony and pentachlorophenol would achieve the RAGs given the small size of this site, since other contaminants exceeded the direct exposure RAGs. Service area 9 was remediated based on the exceedance of the direct exposure RAGs for multiple COPCs.

Service Area 10 (Test Pits 21 and 23)

The manhole to the junction box containing the two 0.15 m (6-in.) VCPs and two 0.2 m (8-in.) VCPs was opened on December 27, 2004. This junction box received effluent from service areas 1, 2, and 3. Sediment (J025J1) was collected from the bottom of the junction box, approximately 3.6 m (12 ft) bgs. Test pit 21 was excavated on December 27, 2004 (Figure 15). The 0.2 m (8-in.) VCP that exited the junction box was encased in concrete. A soil sample (J025J2) was collected under the pipe.

The manhole to the junction box containing the 0.15 m (6-in.) VCP and two 0.2 m (8-in.) VCPs was opened on December 27, 2004. This junction box received effluent from the junction box described in the paragraph above and service area 4. Sediment (J025J3) was collected from the bottom of the junction box approximately 3.4 m (11 ft) bgs. Test pit 23 was excavated on December 27, 2004 (Figure 16). A soil sample (J025J4) was collected under the junction box.

Figure 15. 100-F-26:9 Test Pit 21. **Figure 16. 100-F-26:9 Test Pit 23.**

The soil and sediment sample results are discussed below. Table 11 provides a comparison of the maximum detected results for COPCs from underlying soil and junction box sediment samples collected from test pits 21 and 23 against the RAGs identified in the RDR/RAWP (DOE-RL 2005b) or against cleanup levels calculated in accordance with WAC 173-340, Method B.

**Table 11. Comparison of Maximum Values to Action Levels for the 100-F-26:9 Pipeline
Subsite: Service Area 10 Samples. (2 Pages)**

COPC	Kd Value (mL/g)	Maximum Result (pCi/g)		Generic Site Lookup Values ^a (pCi/g)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Sediment	Shallow Zone Lookup Values	Groundwater Protection Lookup Values	River Protection Lookup Values	Soil	Sediment	
Americium-241	200	U	0.045	31.1	-- ^b	-- ^b	No	No	--
Cesium-137	50	U	0.602	6.2	-- ^b	-- ^b	No	No	--
Cobalt-60	50	U	0.063	1.4	-- ^b	-- ^b	No	No	--
Europium-152	200	U	0.752	3.3	-- ^b	-- ^b	No	No	--
COPC	Kd Value (mL/g)	Maximum Result (mg/kg)		Remedial Action Goals ^a (mg/kg)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Sediment	Direct Exposure	Soil Standard for Groundwater Protection	Soil Standard for River Protection	Soil	Sediment	
Antimony	1.4	U	8.4	32	5 ^c	5 ^c	No	Yes	No
Arsenic	3	2	21.7	20 ^a	20 ^a	20 ^a	No	Yes	No
Barium	25	49.4 (<BG)	9420	5,600	132 ^c	224	No	Yes	No
Beryllium	790	0.38 (<BG)	0.49 (<BG)	10.4 ^d	1.51 ^c	1.51 ^c	No	No	--
Boron	3	1.5	11.9	16,000	320	-- ^e	No	No	--
Cadmium	30	U	7.2	13.9	0.81 ^c	0.81 ^c	No	Yes	Yes ^f
Chromium (total)	200	9.4 (<BG)	143	80,000	18.5 ^c	18.5 ^c	No	Yes	Yes ^f
Hexavalent chromium	0	0.36	33.9	2.1	4.8	2	No	Yes	No
Cobalt	50	4.5 (<BG)	11 (<BG)	1,600	32	-- ^e	No	No	--
Copper	22	12.8 (<BG)	654	2,960	59.2	22.0 ^c	No	Yes	Yes ^f
Lead	30	3.1 (<BG)	211	353	10.2 ^c	10.2 ^c	No	Yes	Yes ^f
Manganese	50	246 (<BG)	619	11,200	512 ^c	512 ^c	No	Yes	Yes ^f
Mercury	30	0.05 (<BG)	21.2	24	0.33 ^c	0.33 ^c	No	Yes	Yes ^f
Molybdenum	20	0.4	25	400	8	-- ^e	No	Yes	Yes ^f
Nickel	65	9.2 (<BG)	118	1,600	19.1 ^c	27.4	No	Yes	Yes ^f
Selenium	150	U	2	400	5	1	No	Yes	Yes ^f
Silver	90	0.41 (<BG)	7	400	8	0.73 ^c	No	Yes	Yes ^f
Vanadium	1000	32.6 (<BG)	37.2 (<BG)	560	85.1 ^e	-- ^e	No	No	--
Zinc	30	54.1 (<BG)	2280	24,000	480	67.8 ^c	No	Yes	Yes ^f
TPH ^j	50	U	302	-- ^c	200	200	No	Yes	Yes ^f
Acenaphthene	4.9	U	0.041	4,800	96	129	No	No	--
Acenaphthylene ^e	6.12	U	0.100	4,800	96	129	No	No	--
Anthracene	23.5	U	0.310	24,000	240	1,920	No	No	--
Benzo(a)anthracene	360	U	0.990	1.37 ^h	0.33 ⁱ	0.33 ⁱ	No	Yes	Yes ^f
Benzo(a)pyrene	5500	U	0.810	0.33 ⁱ	0.33 ⁱ	0.33 ⁱ	No	Yes	No
Benzo(b)fluoranthene	880	U	0.790	1.37 ^h	0.33 ⁱ	0.33 ⁱ	No	Yes	Yes ^f
Benzo(g,h,i)perylene ^e	2680	U	0.440	2,400	48	192	No	No	--
Benzo(k)fluoranthene	2020	U	0.820	13.7 ^h	0.33 ⁱ	0.33 ⁱ	No	Yes	Yes ^f
Bis(2-ethylhexyl)phthalate	110	0.060	1.10	71.4	0.6	0.36	No	Yes	Yes ^f
Butylbenzylphthalate	13.8	0.045	0.200	16,000	320	250	No	No	--
Carbazole	200	U	0.110	50	0.437	-- ^e	No	No	--
Chrysene	200	U	1.10	137 ^h	1.2 ^h	0.33 ⁱ	No	Yes	Yes ^f
Dibenzo(a,h)anthracene	1790	U	0.240	0.33 ⁱ	0.33 ⁱ	0.33 ⁱ	No	No	--
Diethylphthalate	0.082	0.033	U	64,000	1,280	4,600	No	No	--
Di-n-butylphthalate	1.57	0.035	0.180	8,000	160	540	No	No	--
Fluoranthene	49.1	U	1.60	3,200	64	18.0	No	No	--
Fluorene	7.71	U	0.065	3,200	64	260	No	No	--
Indeno(1,2,3-cd) pyrene	3470	U	0.440	1.37	0.33 ^h	0.33 ^h	No	Yes	Yes ^f
Phenanthrene ^e	23.5	U	0.870	24,000	240	1,920	No	No	--
Pyrene	68	U	1.50	2,400	48	192	No	No	--
Aroclor-1254	75.6	U	0.620	0.5	0.017 ⁱ	0.017 ⁱ	No	Yes	No

^a Lookup values and RAGs obtained from the 100 Area RDR/RAWP (DOE-RL 2005b) or calculated per WAC 173-340-720, WAC 173-340-730, and WAC 173-340-740, Method B, 1996, unless otherwise noted.

Table 11. Comparison of Maximum Values to Action Levels for the 100-F-26:4 Pipeline Subsite: Service Area 10 Samples. (2 Pages)

- ^b The 100 Area RDR/RAWP (DOE-RL 2005b) does not provide soil cleanup levels for these contaminants to be protective of groundwater and the Columbia River. Based on the soil partitioning distribution coefficient for cesium-137 and cobalt-60 of 50 mL/g, and for europium-152 and europium-154 of 200 mL/g, these contaminants are not predicted to migrate more than 1 m (3.3 ft) vertically in 1,000 years (BHI 2005a). The vadose zone underlying this pipeline site is approximately 5 m (16 ft) thick. Therefore, residual concentrations of this contaminant are predicted to be protective of groundwater and the Columbia River.
- ^c Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996).
- ^d Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) and an airborne particulate mass-loading rate of 0.0001 g/m³ (WDOH 1997).
- ^e No cleanup level is available from the Cleanup Levels and Risk Calculations database (Ecology 2005) and/or no bioconcentration factors or ambient water quality criteria values are available to calculate soil cleanup levels for river protection.
- ^f Based on the 100 Area Analogous Sites RESRAD Calculations (BHI 2005a), residual concentrations are not expected to migrate more than 3 m (9.8 ft) vertically in 1,000 years based on the lowest soil-partitioning coefficient of those contaminants that exceeded the RAG (molybdenum; 20 mL/g). The vadose zone underlying the remediation footprint is approximately 5 m (16 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.
- ^g Toxicity data for this chemical are not available. Cleanup levels are based on the following surrogate chemicals: Contaminant: acenaphthylene, surrogate: acenaphthene; benzo(g,h,i)perylene, surrogate: pyrene; phenanthrene, surrogate: anthracene.
- ^h Cleanup level calculated with updated toxicity values using the appropriate formulas from WAC 173-340-740 (Ecology 1996). Updated toxicity values are available from the EPA Integrated Risk Information System at < <http://www.epa.gov/iris> > or from the Risk Assessment Information System database of the Oak Ridge National Laboratory on the Internet at < <http://risk.lsd.ornl.gov> >.
- ⁱ Where cleanup levels are less than the RDL, cleanup levels default to the RDL (WAC 173-340-707[2], 1996 and DOE-RL 2005b).
- ^j The soil cleanup value for TPH is from WAC 173-340-740(2), Table 2, "Method A Cleanup Levels – Soil," Ecology 1996, for diesel and other.
--	= not applicable	RDR/RAWP = Remedial Design Report/Remedial Action Work Plan for the 100 Area
BG	= background	RESRAD = RESidual RADioactivity (dose model)
COPC	= contaminant of potential concern	TPH = total petroleum hydrocarbon
EPA	= U.S. Environmental Protection Agency	U = not detected
RAG	= remedial action goal	WAC = Washington Administrative Code
RDL	= required detection limit	

Soil Sampling Results

No radionuclide constituents were detected in the soil sample from this test pit. No nonradionuclide constituents were detected at levels exceeding applicable RAGs.

Pipe Sediment Sampling Results

Americium-241, cesium-137, cobalt-60, and europium-152 were detected in the pipe sediment sample from this test pit. Table 12 provides a comparison of the result (second column) for the test pit to direct exposure single radionuclide 15 mrem/yr dose-equivalence values and shows the sum of fractions evaluation. The third column presents the single radionuclide 15 mrem/yr dose-equivalence activity, and the last column presents the result divided by the dose-equivalence activity. As demonstrated by the summation of these fractions, the cumulative dose contributed by residual radionuclide populations will be significantly less than the 15 mrem/yr RAG. None of these radionuclides were predicted to migrate more than 1 m (3.3 ft) vertically in 1,000 years based on their respective soil-partitioning coefficients. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

Table 12. Attainment of Radionuclide Direct Exposure Remedial Action Goal for Service Area 10.

COC/COPCs	Maximum Value (pCi/g)	Activity Equivalent to 15 mrem/yr Dose ^a (pCi/g)	Fraction
Americium-241	0.045	31.1	0.00145
Cesium-137	0.602	6.2	0.0971
Cobalt-60	0.063	1.4	0.045
Europium-152	0.752	3.3	0.228
Total			0.372
Equivalent Dose (mrem/yr)			<5.57

^a Single radionuclide 15 mrem/yr dose-equivalence values and derivation methodology are presented in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 2005b).

COC = contaminant of concern

COPC = contaminant of potential concern

Arsenic, barium, hexavalent chromium, benzo(a)pyrene, and Aroclor-1254 were detected in the sediment at levels exceeding direct exposure RAGs. In addition to these contaminants, antimony, cadmium, chromium, copper, lead, manganese, mercury, molybdenum, nickel, selenium, silver, zinc, TPH, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, and indeno(1,2,3-cd)pyrene were detected at concentrations exceeding RAGs for the protection of groundwater and the Columbia River. Each of these nonradionuclides, with the exception of antimony, were predicted to migrate less than 2 m (6.6 ft) vertically in 1,000 years based on their respective soil-partitioning coefficients. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River. It was not necessary to perform a site-specific risk assessment for antimony, since other contaminants exceeded the direct exposure RAGs. Service area 10 was remediated based on the exceedance of the direct exposure RAGs for the multiple inorganic and semi-volatile organic compounds.

Service Area 11 (Test Pit 26)

Test pit 26 was excavated on December 28, 2004 (Figure 17). The 0.15 m (6-in.) VCP was found encased in concrete and was no longer connected to the junction box. By its absence, the junction box is believed to have been previously removed during remediation of 1607-F2. The material (i.e., soil and sediment) inside the VCP was sampled (J025K0). A soil sample (J025J9) was collected below the VCP.

Figure 17. 100-F-26:9 Test Pit 26.

The soil and sediment sample results are discussed below. Table 13 provides a comparison of the maximum detected results for COPCs from underlying soil and junction box sediment samples collected from test pit 26 against the RAGs identified in the RDR/RAWP (DOE-RL 2005b) or against cleanup levels calculated in accordance with WAC 173-340, Method B.

Soil Sampling Results

No radionuclide constituents were detected in the soil sample from this test pit. No nonradionuclide constituents were detected at levels exceeding direct exposure RAGs. Bis(2-ethylhexyl)phthalate was detected at a concentration exceeding the RAG for the protection of groundwater and the Columbia River. bis(2-ethylhexyl)phthalate was predicted to migrate less than 0.3 m (1.0 ft) vertically in 1,000 years based on its soil-partitioning coefficient. Therefore, the residual concentration of Bis(2-ethylhexyl)phthalate is predicted to be protective of groundwater and the Columbia River. All other nonradionuclide constituents were not detected at levels exceeding applicable RAGs.

Pipe Sediment Sampling Results

Cesium-137 was the only radionuclide constituent detected in the sediment sample from this test pit. It was quantified below its single-radionuclide 15 mrem/yr dose-equivalence lookup value. No nonradionuclides were detected in the pipe sediment at levels exceeding direct exposure RAGs. Cesium-137 is predicted to migrate less than 1 m (3.3 ft) vertically in 1,000 years based on its soil-partitioning coefficients. Therefore, the residual concentration of cesium-137 is predicted to be protective of groundwater and the Columbia River.

**Table 13. Comparison of Maximum Values to Action Levels
for the 100-F-26:9 Pipeline Subsite: Service Area 11 Samples. (2 Pages)**

COPC	Kd Value (mL/g)	Maximum Result (pCi/g)		Generic Site Lookup Values ^a (pCi/g)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Sediment	Shallow Zone Lookup Values	Groundwater Protection Lookup Values	River Protection Lookup Values	Soil	Sediment	
Cesium-137	50	U	0.172	6.2	-- ^d	-- ^d	No	No	--
COPC	Kd Value (mL/g)	Maximum Result (mg/kg)		Remedial Action Goals ^a (mg/kg)			Does the Maximum Result Exceed RAGs?		Do the Maximum Results Pass RESRAD Modeling?
		Soil	Sediment	Direct Exposure	Soil Standard for Groundwater Protection	Soil Standard for River Protection	Soil	Sediment	
Antimony	1.4	U	0.34 (<BG)	32	5 ^c	5 ^c	No	No	--
Arsenic	3	1.7 (<BG)	2.4 (<BG)	20	20	20	No	No	--
Barium	25	59.9 (<BG)	139	5,600	132 ^c	224	No	Yes	Yes ^d
Beryllium	790	0.45 (<BG)	0.5 (<BG)	10.4 ^c	1.51 ^c	1.51 ^c	No	No	--
Boron	3	0.72	3.5	16,000	320	-- ^f	No	No	--
Cadmium	30	U	0.05 (<BG)	13.9	0.81 ^c	0.81 ^c	No	No	--
Chromium (total)	200	6.6 (<BG)	14.5 (<BG)	80,000	18.5 ^c	18.5 ^c	No	No	--
Hexavalent chromium	0	U	0.4	2.1	4.8	2	No	No	--
Cobalt	50	4.9 (<BG)	5.7 (<BG)	1,600	32	-- ^f	No	No	--
Copper	22	9 (<BG)	20.1 (<BG)	2,960	59.2	22.0 ^c	No	No	--
Lead	30	2.6 (<BG)	15.1	353	10.2 ^c	10.2 ^c	No	Yes	Yes ^d
Manganese	50	224 (<BG)	264 (<BG)	11,200	512 ^c	512 ^c	No	No	--
Mercury	30	U	3.5	24	0.33 ^c	0.33 ^c	No	Yes	Yes ^d
Nickel	65	8.3 (<BG)	16.7 (<BG)	1,600	19.1 ^c	27.4	No	No	--
Silver	90	U	3.2	400	8	0.73 ^c	No	Yes	Yes ^d
Vanadium	1000	33.6 (<BG)	34.6 (<BG)	560	85.1 ^c	-- ^f	No	No	--
Zinc	30	29.3 (<BG)	94.8	24,000	480	67.8 ^c	No	Yes	Yes ^d
Acenaphthylene ^e	6.12	U	0.025	4,800	96	129	No	No	--
Anthracene	23.5	U	0.074	24,000	240	1,920	No	No	--
Benzo(a)anthracene	360	U	0.430	1.37 ^h	0.33 ⁱ	0.33 ⁱ	No	Yes	Yes ^d
Benzo(a)pyrene	5500	U	0.330	0.33 ⁱ	0.33 ⁱ	0.33 ⁱ	No	No	--
Benzo(b)fluoranthene	880	U	0.340	1.37 ^h	0.33 ⁱ	0.33 ⁱ	No	Yes	Yes ^d
Benzo(g,h,i)perylene ^e	2680	U	0.240	2,400	48	192	No	No	--
Benzo(k)fluoranthene	2020	U	0.330	13.7 ^h	0.33 ⁱ	0.33 ⁱ	No	No	--
Bis(2-ethylhexyl)phthalate	110	0.69	0.160	71.4	0.6	0.36	Yes	No	Yes ^d
Butylbenzylphthalate	13.8	0.041	0.020	16,000	320	250	No	No	--
Carbazole	200	U	0.036	50	0.437	-- ^f	No	No	--
Chrysene	200	U	0.430	137 ^h	1.2 ^h	0.33 ⁱ	No	Yes	Yes ^d
Dibenzo(a,h)anthracene	1790	U	0.110	0.33 ⁱ	0.33 ⁱ	0.33 ⁱ	No	No	--
Diethylphthalate	0.082	0.03	U	64,000	1,280	4,600	No	No	--
Di-n-butylphthalate	1.57	U	0.062	8,000	160	540	No	No	--
Fluoranthene	49.1	U	0.670	3,200	64	18.0	No	No	--
Indeno(1,2,3-cd)pyrene	3470	U	0.230	1.37	0.33 ^h	0.33 ^h	No	No	--
Phenanthrene ^e	23.5	U	0.248	24,000	240	1,920	No	No	--
Pyrene	68	U	0.640	2,400	48	192	No	No	--
Aroclor-1254	75.6	U	0.046	0.5	0.017 ⁱ	0.017 ⁱ	No	Yes	Yes ^u

^a Lookup values and RAGs obtained from the 100 Area RDR/RAWP (DOE-RL 2005b) or calculated per WAC 173-340-720, WAC 173-340-730, and WAC 173-340-740, Method B, 1996, unless otherwise noted.

^b The 100 Area RDR/RAWP (DOE-RL 2005b) does not provide soil cleanup levels for this contaminant to be protective of groundwater and the Columbia River. Based on the soil partitioning distribution coefficient for cesium-137 of 50 mL/g, this contaminant is not predicted to migrate more than 1 m (3.3 ft) vertically in 1,000 years (BHI 2005a). The vadose zone underlying this pipeline site is at least 5 m (16 ft) thick. Therefore, residual concentration of this contaminant is predicted to be protective of groundwater and the Columbia River.

^c Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996).

^d Based on the 100 Area Analogous Sites RESRAD Calculations (BHI 2005a), residual concentrations are not expected to migrate more than 2 m (6.6 ft) vertically in 1,000 years based on the lowest soil-partitioning coefficient of those contaminants that exceeded the RAG (barium; 25 mL/g). The vadose zone underlying the remediation footprint is approximately 5 m (16 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

^e Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) and an airborne particulate mass-loading rate of 0.0001 g/m³ (WDOH 1997).

Table 13. Comparison of Maximum Values to Action Levels for the 100-F-26:4 Pipeline Subsite: Service Area 11 Samples. (2 Pages)

- ^f No cleanup level is available from the Cleanup Levels and Risk Calculations database (Ecology 2005) and/or no bioconcentration factors or ambient water quality criteria values are available to calculate soil cleanup levels protective of the river.
- ^g Toxicity data for this chemical are not available. Cleanup levels are based on the following surrogate chemicals: Contaminant: acenaphthylene, surrogate: acenaphthene; benzo(g,h,i)perylene, surrogate: pyrene; phenanthrene, surrogate: anthracene.
- ^h Cleanup level calculated with updated toxicity values using the appropriate formulas from WAC 173-340-740 (Ecology 1996). Updated toxicity values are available from the EPA Integrated Risk Information System at < <http://www.epa.gov/iris> > or from the Risk Assessment Information System database of the Oak Ridge National Laboratory on the Internet at < <http://risk.lsd.ornl.gov> >.
- ⁱ Where cleanup levels are less than the RDL, cleanup levels default to the RDL (WAC 173-340-707[2], 1996 and DOE-RL 2005b).
- = not applicable RDR/RAWP = Remedial Design Report/Remedial Action Work Plan for the 100 Area
- BG = background RESRAD = RESidual RADioactivity (dose model)
- COPC = contaminant of potential concern TPH = total petroleum hydrocarbon
- EPA = U.S. Environmental Protection Agency U = not detected
- RAG = remedial action goal WAC = Washington Administrative Code
- RDL = required detection limit

No nonradionuclides were detected in the pipe sediment at levels exceeding direct exposure RAGs. Barium, lead, mercury, silver, zinc, benzo(a)anthracene, benzo(b)fluoranthene, chrysene, and Aroclor-1254 were detected at concentrations exceeding RAGs for the protection of groundwater and/or the Columbia River. Each of these nonradionuclides were predicted to migrate less than 2 m (6.6 ft) vertically in 1,000 years based on their respective soil-partitioning coefficients. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River. Service area 11 was remediated since it was downstream of service areas 2 and 10 which exceeded direct exposure RAGs for the multiple inorganic and semi-volatile organic compounds.

Human Health Risk Evaluation for Nonradionuclides (Cumulative)

Assessment of the risk requirements for the 100-F-26:9 pipeline site is determined by calculation of the hazard quotient and carcinogenic (excess cancer) risk values for nonradionuclides. These calculations are located in Appendix C. The requirements include an individual hazard quotient of less than 1.0, a cumulative hazard quotient of less than 1.0, an individual contaminant carcinogenic risk of less than 1×10^{-6} , and a cumulative excess carcinogenic risk of less than 1×10^{-5} . These risk values were calculated for each service area of the pipeline site using the highest values from the samples (pipe contents and underlying soils) among the test pits that make up each service area. Service areas 2, 9, 10, and 11 were remediated and are included in a separate calculation.

Risk values were not calculated for constituents that were not detected or were detected at concentrations below Hanford Site or Washington State background values. Table 14 provides a summary of the risk values calculated for each service area. The calculations indicated that all individual hazard quotients for noncarcinogenic constituents are less than 1.0. The maximum cumulative hazard quotient for the 100-F-26:9 pipeline site is 8.1×10^{-1} . All individual cumulative carcinogenic risk values are less than 1×10^{-6} . The maximum cumulative carcinogenic risk value is 3.4×10^{-6} , which is less than the limitation of total excess cancer risk of $<1 \times 10^{-5}$ for carcinogens. Therefore, nonradionuclide risk requirements are met.

Table 14. Summary of Cumulative Risk and Achievement of Remedial Action Goals for Service Areas Following Confirmatory Sampling.

Service Area	Test Pit(s)	Cumulative Hazard Quotient	Cumulative Carcinogenic Risk	Disposition
	RAG	1.0	1.0E-05	--
1	19	1.5E-02	3.2E-07	Achieved RAGs
2	12	NA	NA	Remediated
3	8	7.7E-02	3.4E-06	Achieved RAGs
4	22	6.1E-02	3.6E-07	Achieved RAGs
5	28	6.3E-01	9.8E-07	Achieved RAGs
6	40	2.2E-03	1.8E-07	Achieved RAGs
7	24	9.6E-04	1.4E-07	Achieved RAGs
8	25	3.7E-03	1.6E-07	Achieved RAGs
9	27	--	--	Remediated
10	21 and 23	--	--	Remediated
11	26	--	--	Remediated

-- = not applicable

RAG = remedial action goals

Confirmatory Sampling Summary

Twelve test pits were excavated and sampled in the 100-F-26:9 pipeline subsite. The contaminants at seven of the service areas (1, 3, 4, 5, 6, 7 and 8) were found to be at concentrations protective of human health, groundwater, and the Columbia River.

Multiple COPCs, including arsenic, barium, cadmium, hexavalent chromium, lead, mercury, benzo(a)pyrene, and Aroclor-1254, were detected above direct exposure RAGs at one or more service areas (2, 9, and 10) of the 100-F-26:9 pipeline site. Based on these findings, a remedial action requirement was determined for service areas 2, 9, and 10. Service Area 11 was remediated because it was downstream of service areas 2 and 10.

REMEDIAL ACTION SUMMARY

Remedial action at the 100-F-26:9 pipeline site was performed between February 8 and October 30, 2007. The site was excavated between 2.4 m (8 ft) and 3.7 m (12 ft) below grade resulting in approximately 1,360 bank cubic meters (BCM) (1,780 bank cubic yards [BCY]) of material removed for disposal at the Environmental Restoration Disposal Facility (ERDF), including removal of approximately 584 m (1,916 ft) of pipeline. Approximately 6,340 BCM (8,292 BCY) of soil (overburden) was removed and stockpiled for evaluation for use as clean backfill. A photograph of the partially excavated pipeline is shown in Figures 18 and 19. The pipeline's entire length was encased in concrete.

Figure 18. 100-F-26:9 Pipeline During Excavation of Site. **Figure 19. Aerial Photograph of 100-F-26:9 Pipeline Remediation in Progress April 10, 2007.**

The pipeline ran under major roadways in the 100-F area at two locations. In order to accommodate site access, one of the locations was excavated, immediately sampled, and backfilled. During the excavation, a 5.1-cm (2-in.) steel sodium dichromate pipeline (100-F-26:7) was breached by the excavator bucket. The pipeline broke open spilling approximately 5 gal of yellowish-green liquid into the excavation. The spill area was sampled, the soil remediated, and a sample was collected to verify that all impacted soil had been excavated (refer to sample RC-2 in Table 15). The 100-F-26:7 pipeline is a separate subsite and will be remediated at a later date. There were no other anomalies or stained soil discovered during remediation.

FIELD SCREENING

Radiological field screening was conducted during the site remedial action. Field screening was used to guide the excavation to quickly assess the presence and level of contamination. Field screening at the site included using a radiological data mapping system survey (Global Positioning Environmental Radiological Surveyor [GPERS]) and hand-held sodium iodide detectors. The radiological surveys indicated a localized spot of elevated radioactivity at the north end in the excavation. The area was thoroughly resurveyed using hand-held beta-gamma detectors and found no indication of remaining contamination. No further action was taken regarding this anomalous reading.

The radiological surveys completed in the overburden and layback stockpiles did not indicate the presence of radioactive contamination following remediation. The GPERS radiological surveys for the 100-F-26:9 service areas 2, 9, 10, and 11 pipeline site are provided in Appendix D.

VERIFICATION SAMPLING ACTIVITIES

RAGs are the specific numeric goals against which the cleanup verification data are evaluated to demonstrate attainment of the remedial action objectives for the site. Verification sampling for the 100-F-26:9 service areas 2, 9, 10, and 11 pipeline site was performed between February 2007 and February 2008 (WCH 2007a, 2007b) to collect data to determine if the RAGs had been met. 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 site.

Contaminants of Concern and Contaminants of Potential Concern

The COC/COPCs for verification sampling were identified in the *100-F-26:9, 1607-F2 Sanitary Sewer Pipelines Verification Work Instruction* (WCH 2007c) as gamma-emitting radionuclides by gamma energy analysis, alpha-emitting radionuclides by gross alpha proportional counting; beta-emitting radionuclides by gross beta proportional counting and for inductively coupled plasma metals, mercury, hexavalent chromium, TPH, semivolatile organic compounds, and PCBs.

Verification Sampling Design for Service Areas 2, 9, 10, and 11

This section describes the basis for selection of an appropriate sample design and determination of the number of verification samples that were collected. The 100-F-26:9 service areas 2, 9, 10, and 11 pipeline subsite was divided into three decision units for the purpose of verification sampling. The first decision unit consisted of the excavation footprint of the pipeline, the second decision unit consisted of the overburden and layback stockpiles, and the third decision unit consisted of the staging pile footprint. Judgmental samples were also collected at the road crossings and are included in the data evaluation for the excavation footprint decision unit.

The decision rule for demonstrating compliance with the cleanup criteria requires comparison of the true population mean, as estimated by the 95% upper confidence limit on the sample mean, with the cleanup level. Therefore, a statistical sampling design was selected as the verification sampling approach for the three decision units because the distribution of potential residual soil contamination over these areas was uncertain. The Washington State Department of Ecology publication *Guidance on Sampling and Data Analysis Methods* (Ecology 1995) recommends that systematic sampling with sample locations distributed over the entire study area be used. This sampling approach is referred to by the Washington State Department of Ecology as “area-wide sampling.” Additional discussion of the development of the statistical verification design is provided in the 100-F-26:9 verification work instruction (WCH 2007c).

A summary of the samples collected and the analyses performed for the verification sampling event are presented in Tables 15 and 16.

Table 15. 100-F-26:9 Statistical Verification Sampling Summary Table. (3 Pages)

Sample Location	Sample Media	Sample Number	Coordinate Locations ^a	Sample Analysis
SZ-1	Soil	J16934	N 147705.1 E 580458.9	ICP metals, mercury, hexavalent chromium, PCB, TPH, SVOA, GEA, gross alpha, gross beta
SZ-2	Soil	J16935	N 147704.9 E 580481.4	same as SZ-1
SZ-3	Soil	J16936	N 147704.7 E 580504.0	same as SZ-1
SZ-4	Soil	J16937	N 147709.3 E 580623.4	same as SZ-1
SZ-5	Soil	J16938	N 147709.1 E 580646.0	same as SZ-1
SZ-6	Soil	J16939	N 147732.9 E 580799.4	same as SZ-1
SZ-7	Soil	J16940	N 147772.0 E 580799.8	same as SZ-1
SZ-8	Soil	J16941	N 147858.6 E 580798.9	same as SZ-1
SZ-9	Soil	J16942	N 147897.7 E 580799.2	same as SZ-1

Table 15. 100-F-26:9 Statistical Verification Sampling Summary Table. (3 Pages)

Sample Location	Sample Media	Sample Number	Coordinate Locations ^a	Sample Analysis
SZ-10	Soil	J16943	N 147936.8 E 580799.6	same as SZ-1
Duplicate of SZ-10	Soil	J16944	N 147936.8 E 580799.6	same as SZ-1
OB-1	Soil	J16947	N 147720.2 E 580743.4	ICP metals, mercury, hexavalent chromium, PCB, TPH, SVOA, GEA, gross alpha, gross beta
OB-2	Soil	J16948	N 147746.2 E 580807.8	same as OB-1
OB-3	Soil	J16949	N 147691.1 E 580617.8	same as OB-1
OB-4	Soil	J16950	N 147769.1 E 580811.0	same as OB-1
OB-5	Soil	J16951	N 147710.9 E 580559.9	same as OB-1
OB-6	Soil	J16952	N 147719.6 E 580581.3	same as OB-1
OB-7	Soil	J16953	N 147713.5 E 580459.0	same as OB-1
OB-8	Soil	J16954	N 147722.1 E 580480.5	same as OB-1
OB-9	Soil	J16955	N 147875.0 E 580805.7	same as OB-1
OB-10	Soil	J16956	N 147898.0 E 580808.9	same as OB-1
OB-11	Soil	J16957	N 147715.1 E 580421.2	same as OB-1
OB-12	Soil	J16958	N 147698.0 E 580788.2	same as OB-1
OB-13	Soil	J16959	N 147714.1 E 580811.6	same as OB-1
OB-14	Soil	J16960	N 147952.5 E 580784.1	same as OB-1
SP-1	Soil	J16961	N 147737.5 E 580465.9	ICP metals, mercury, hexavalent chromium, PCB, TPH, SVOA, pesticides, GEA, gross alpha, gross beta
SP-2	Soil	J16962	N 147746.9 E 580490.7	same as SP-1
SP-3	Soil	J16963	N 147735.4 E 580395.7	same as SP-1
SP-4	Soil	J16964	N 147744.8 E 580420.5	same as SP-1
SP-5	Soil	J16965	N 147754.3 E 580445.3	same as SP-1
SP-6	Soil	J16966	N 147763.7 E 580470.1	same as SP-1
SP-7	Soil	J16967	N 147773.1 E 580494.9	same as SP-1
SP-8	Soil	J16968	N 147761.6 E 580400.0	same as SP-1

Table 15. 100-F-26:9 Statistical Verification Sampling Summary Table. (3 Pages)

Sample Location	Sample Media	Sample Number	Coordinate Locations ^a	Sample Analysis
SP-9	Soil	J16969	N 147771.0 E 580424.8	same as SP-1
SP-10	Soil	J16970	N 147780.4 E 580449.6	same as SP-1
Duplicate of SP-10	Soil	J16971	N 147780.4 E 580449.6	same as SP-1

Source: Field logbooks EFL-1174-4 (WCH 2007b).

^a Washington State Plane (meters).

GEA = gamma energy analysis

ICP = inductively coupled plasma

OB = overburden

PCB = polychlorinated biphenyl

SP = staging pile

SVOA = semivolatile organic analysis

SZ = shallow zone

TPH = total petroleum hydrocarbons

Table 16. 100-F-26:9 Judgmental Verification Sampling Summary Table. (2 Pages)

Sample Location	Description	Sample Media	Sample Number	Coordinate Locations ^a	Sample Analysis
RC-1	Road crossing	Soil	J14JT0	N 147708.8 E 580559.2	ICP metals, mercury, hexavalent chromium, PCBs, SVOA, TPH, GEA, gross alpha, gross beta
RC-2	Road crossing (spill cleanup)	Soil	J14JT3	N 147708.9 E 580567.5	Same as RC-1
RC-3	Road crossing	Soil	J14JT4	N 147709.0 E 580619.8	Same as RC-1
RC-4	Road crossing	Soil	J13W57	N 147709.0 E 580646.4	Same as RC-1
RB-1	Overburden stockpile	Soil	J14JT1	N 147714.6 E 580555.1	Same as RC-1
RB-2	Overburden stockpile	Soil	J14JT2	N 147720.3 E 580553.8	Same as RC-1
RB-3	Overburden stockpile	Soil	J14JT5	N 147687.3 E 580677.9	Same as RC-1
FS-1	Road crossing (pipe remains)	Soil	J16945	N 147705 E 580655	Same as RC-1
FS-2	Road crossing (pipe remains)	Soil	J16946	N 147705 E 580721	Same as RC-1
FS-3	Road crossing	Soil	J169W9	N 147709 E 580534	Same as RC-1
FS-4	Road crossing	Soil	J169X0	N 147707 E 580545	Same as RC-1
FS-5	Road crossing	Soil	J169X1	N 147707 E 580558	Same as RC-1

Table 16. 100-F-26:9 Judgmental Verification Sampling Summary Table. (2 Pages)

Sample Location	Description	Sample Media	Sample Number	Coordinate Locations ^a	Sample Analysis
--	Equip. blank	Silica sand	J16933	--	ICP metals, mercury, SVOA

Source: Field logbooks EFL-1174-2 (WCH 2007a).

^a Washington State Plane (meters).

--	= not applicable	RB	= road crossing overburden sample
FS	= focused sample	RC	= road crossing verification sample
ICP	= inductively coupled plasma	SVOA	= semivolatile organic analysis
GEA	= gamma energy analysis	TPH	= total petroleum hydrocarbons
PCB	= polychlorinated biphenyl		

Verification Sampling – Excavation Footprint

The sampling area was restricted to a narrow segment of the excavation floor directly below the location of the removed pipelines. This area (Figure 20) was delineated in Visual Sample Plan¹ (VSP) and used as the basis for location of a random-start systematic grid for verification soil sample collection locations. A total of 10 soil samples were collected on a random-start, triangular grid for this sampling area (Figure 21). A triangular grid was selected for this investigation based on studies that indicate triangular grids are superior to square grids (Gilbert 1987).

Verification Sampling – Overburden Stockpile

Verification sampling of the overburden and layback stockpiles was performed to evaluate the suitability of the soil for use as clean backfill for the excavation. This area was delineated in VSP and used as the basis for placement of a random-start systematic grid for verification soil sample collection locations. A total of 10 soil samples were collected on a random-start, triangular grid for this sampling area. However, because placement of the sampling grid over the soil stockpile area results in four of the smaller stockpiles not being sampled, an additional sample was located and collected for each of those soil stockpiles. This resulted in 10 samples located using the grid plus four more, one located in the center of each of the other four stockpiles. Therefore, a total of 14 verification soil samples were collected from the overburden soil stockpiles (identified with the prefix “OB-” in Figure 22) and were used in the statistical calculations.

¹ Visual Sample Plan is a site map-based user-interface program that may be downloaded at <http://dgo.pnl.gov>.

Figure 20. 100-F-26:9 Service Areas 2, 9, 10, and 11 Post-Excavation Topography.

Figure 21. Verification Soil Sample Locations at the 100-F-26:9 Service Areas 2, 9, 10, and 11 Pipeline Excavation Footprint.

Figure 22. Verification Soil Sample Locations at the 100-F-26:9 Overburden Stockpile and Staging Pile Footprint.

Verification Sampling- Staging Pile Footprint

Contaminated soil from 100-F-26:9 was stockpiled onsite prior to disposal at ERDF. The stockpile was also used to stage pipeline remnants from other 100-F-26 subsite remedial actions, including:

- 100-F-26:4, South process pipelines
- 100-F-26:8, 1607-F1 sanitary sewer pipelines
- 100-F-26:9, 1607-F2 sanitary sewer pipelines
- 100-F-26:10, 1607-F3 sanitary sewer pipelines
- 100-F-26:13, 108-F drain pipelines
- 100-F-26:14, 116-F-5 influent pipelines
- 100-F-26:15, Miscellaneous pipelines associated with the 1608-F sump.

The entire stockpile, including pipeline remnants, was removed and disposed of at ERDF. The location where the stockpile stood is referred to as the miscellaneous pipe staging-pile footprint (referred to herein as “staging pile footprint”) for sampling purposes. The staging pile footprint was also delineated in VSP and used as the basis for location of a random-start systematic grid for verification soil sample collection locations. A total of 10 sample locations were identified for this area (identified with the prefix “SP-” in Figure 22).

Judgmental Samples

There were 12 additional samples taken at discreet locations (identified with the prefixes “FS-”, “RB-”, and “RC-” in Figure 23). These focused samples were placed using professional judgment. Three were placed at the anticipated road crossing location (RC-1, RC-3 and RC-4). Later, it was discovered that the road crossing was actually constructed east of where the samples were taken. The road crossing was excavated again and three samples (FS-3, FS-4 and FS-5) were collected at the new location. The area was subsequently backfilled to accommodate the road crossing.

A second road crossing was adjacent to a utility pole and was the primary access point into the 100-F Area. The decision was made to abandon a short section of the 100-F-26:9 pipeline in-place after a cost-benefit analysis. Verification samples were collected from below the pipe on each end of the road crossing to support site close out (FS-1 and FS-2).

A soil sample (RC-2) was collected where a release of liquid containing sodium dichromate (from the breached 100-F-26:7 pipeline) was remediated. Verification sampling was also performed for the overburden stockpiles used to backfill the road crossing. Three discrete samples (RB-1, RB-2 and RB-3) were collected from the surface of the stockpiles.

Figure 23. Verification Samples Used in Data Evaluation for Excavation Footprint Decision Unit.

Verification Sampling Results

Verification samples were analyzed using U.S. Environmental Protection Agency-approved analytical methods. The laboratory-reported data results for all constituents are stored in the ENRE project-specific database prior to submission for archival in the HEIS site-wide database and are summarized in Appendix B.

As noted earlier, the 100-F-26:9 service areas 2, 9, 10, and 11 pipeline subsite was divided into three decision units for verification sampling: (1) excavation footprint, (2) overburden and layback stockpile, and (3) staging pile footprint. Evaluation of the verification data was calculated using the 95% upper confidence limit (UCL) on the true population mean for residual concentrations of COCs/COPCs. The calculations were also performed on other analytes included in the analyses requested for the COCs/COPCs. These calculations are provided in Appendix C. When a nonradionuclide analyte was detected in fewer than 50% of the verification samples collected, the maximum detected value was used for comparison against the RAGs. If no detections for a given analyte were reported in the data set, no statistical evaluation or calculations were performed for that analyte.

The judgmental samples were first evaluated by direct comparison of the maximum sample results for each detected analyte against cleanup criteria. The maximum sample result was then compared to the 95% UCL derived from the statistically placed excavation verification samples. The higher value of the two data sets (maximum and 95% UCL) was used to evaluate against the cleanup criteria (Table 17). Comparisons of the analyte results using the 95% UCL with the shallow zone RAGs for the other two decision units are summarized in Tables 18 and 19.

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 2005) under *Washington Administrative Code* (WAC) 173-340-740(3) for aluminum, calcium, iron, magnesium, potassium, silicon, and sodium; therefore, these constituents are not considered site COCs. Potassium-40, radium-226, radium-228, thorium-228, and thorium-232 were detected in samples collected at the site, but are not considered within statistical calculations or the following tables, as these isotopes are not related 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 DOE-RL 1996).

Table 17. Comparison of Statistical Contaminant Concentrations to Action Levels for the 100-F-26:9 Excavation Footprint Verification Sampling Event. (2 Pages)

COC/COPC	Maximum Result (pCi/g)	Generic Site Lookup Values ^a (pCi/g)			Does the Maximum Result Exceed Lookup Values?	Does the Result Pass RESRAD Modeling?
		Shallow Zone Lookup Value	Groundwater Protection Lookup Value	River Protection Lookup Value		
Cesium-137	0.289	6.2	-- ^b	-- ^b	No	--
COC/COPC	Maximum Result (mg/kg)	Remedial Action Goals ^a (mg/kg)			Does the Maximum Result Exceed RAGs?	Does the Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Antimony	1.6 (<BG)	32	5 ^c	5 ^c	No	--
Arsenic	2.7 (<BG)	20	20	20	No	--
Barium	329	5,600	132 ^c	224	Yes	Yes ^d
Beryllium	0.39 (<BG)	10.4 ^e	1.5 ^c	1.51 ^c	No	--
Boron	28.6	16,000	320	-- ^f	No	--
Cadmium	0.23 (<BG)	13.9	0.81 ^c	0.81 ^c	No	--
Chromium (total)	9.1 (<BG)	80,000	18.5 ^c	18.5 ^c	No	--
Cobalt	6.3 (<BG)	1,600	32	-- ^f	No	--
Copper	26.5	2,960	59.2	22.0 ^c	Yes	Yes ^d
Hexavalent chromium	0.38	2.1	4.8	2	No	--
Lead	16.9	353	10.2 ^c	10.2 ^c	Yes	Yes ^d
Manganese	288 (<BG)	11,200	512 ^c	512 ^c	No	--
Mercury	0.27 (<BG)	24	0.33 ^c	0.33 ^c	No	--
Molybdenum	1.1	400	8	-- ^f	No	--
Nickel	10.1 (<BG)	1,600	19.1 ^c	27.4	No	--
Selenium	1.3	400	5	1	Yes	Yes ^d
Silver	1.2	400	8	0.73 ^c	Yes	Yes ^d
Vanadium	42.8 (<BG)	560	85.1 ^c	-- ^f	No	--
Zinc	77.6	24,000	480	67.8 ^c	Yes	Yes ^d
Anthracene	0.026	24,000	240	1,920	No	--
Benzo(a)anthracene	0.130	1.37 ^g	0.33 ^h	0.33 ^h	No	--
Benzo(a)pyrene	0.120	0.33 ^h	0.33 ^h	0.33 ^h	No	--
Benzo(b)fluoranthene	0.096	1.37 ^g	0.33 ⁱ	0.33 ^h	No	--
Benzo(ghi)perylene ⁱ	0.087	2,400	48	192	No	--

Table 17. Comparison of Statistical Contaminant Concentrations to Action Levels for the 100-F-26:9 Excavation Footprint Verification Sampling Event. (2 Pages)

COC/COPC	Maximum Result (mg/kg)	Remedial Action Goals ^a (mg/kg)			Does the Maximum Result Exceed RAGs?	Does the Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Benzo(k)fluoranthene	0.101	13.7 ^g	0.33 ^h	0.33 ^h	No	--
Bis(2-ethylhexyl)phthalate	0.450	71.4	0.6	0.36	Yes	Yes ^d
Chrysene	0.159	137 ^g	1.2 ^g	0.33 ^h	No	--
Dibenz(a,h)anthracene	0.036	0.33 ^h	0.33 ^h	0.33 ^h	No	--
Fluoranthene	0.287	3,200	64	18.0	No	--
Indeno(1,2,3-cd)pyrene	0.074	1.37	0.33 ^h	0.33 ^h	No	--
Naphthalene	0.023	1,600	16.0	988	No	--
Phenanthrene ⁱ	0.145	24,000	240	1,920	No	--
Pyrene	0.310	2,400	48	192	No	--
Aroclor-1254	0.092	0.5	0.017 ^h	0.017 ^h	Yes	Yes ^d
Aroclor-1260	0.060	0.5	0.017 ^h	0.017 ^h	Yes	Yes ^d

^a Lookup values and RAGs obtained from the 100 Area RDR/RAWP (DOE-RL 2005b) or calculated per WAC 173-340-720, WAC 173-340-730, and WAC 173-340-740, Method B, 1996, unless otherwise noted.

^b The 100 Area RDR/RAWP (DOE-RL 2005) does not provide soil cleanup levels for this contaminant to be protective of groundwater and the Columbia River. Based on the soil partitioning distribution coefficient for cesium-137 of 50 mL/g, this contaminant is not predicted to migrate more than 1 m (3.3 ft) vertically in 1,000 years (BHI 2005a). The vadose zone underlying this pipeline site is approximately 5 m (16 ft) thick. Therefore, residual concentrations of this contaminant are predicted to be protective of groundwater and the Columbia River.

^c Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996).

^d Based on the 100 Area Analogous Sites RESRAD Calculations (BHI 2005a), residual concentrations are not expected to migrate more than 3 m (10 ft) vertically in 1,000 years (based on the lowest soil-partitioning distribution coefficient [copper] of 22 mL/g). The vadose zone underlying the remediation footprint is approximately 5 m (16 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

^e Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) and an airborne particulate mass-loading rate of 0.0001 g/m³ (WDOH 1997).

^f No cleanup level is available from the *Cleanup Levels and Risk Calculations Database* (Ecology 2005), and/or no bioconcentration factor or ambient water quality criteria values are available to calculate cleanup levels (WAC 173-340-730(3)(a)(iii), 1996 [Method B for surface waters]).

^g Cleanup level calculated with updated toxicity values using the appropriate formulas from WAC 173-340-740 (Ecology 1996). Updated toxicity values are available from the EPA Integrated Risk Information System at < <http://www.epa.gov/iris> > or from the Risk Assessment Information System database of the Oak Ridge National Laboratory on the Internet at < <http://risk.lsd.ornl.gov> >.

^h Where cleanup levels are less than RDLs, cleanup levels default to RDLs (WAC 173-340-707(2), 1996 and DOE-RL 2005b).

ⁱ Toxicity data for this chemical are not available. Cleanup levels are based on the following surrogate chemicals: Contaminant: benzo(g,h,i)perylene, surrogate: pyrene; phenanthrene, surrogate: anthracene.

-- = not applicable

RDL = required detection limit

BG = background

RDR/RAWP = Remedial Design Report/Remedial Action Work Plan for the 100 Area

COC = contaminant of concern

RESRAD = RESidual RADioactivity (dose assessment model)

COPC = contaminant of potential concern

WAC = Washington Administrative Code

EPA = U.S. Environmental Protection Agency

RAG = remedial action goal

Table 18. Comparison of Maximum Contaminant Concentrations to Action Levels for the 100-F-26:9 Overburden Stockpile Verification Sampling Event. (2 Pages)

COC/COPC	Maximum Result (pCi/g)	Generic Site Lookup Values ^a (pCi/g)			Does the Maximum Result Exceed Lookup Values?	Does the Result Pass RESRAD Modeling?
		Shallow Zone Lookup Value	Groundwater Protection Lookup Value	River Protection Lookup Value		
Cesium-137	0.030	6.2	-- ^b	-- ^b	No	--
COC/COPC	Maximum Result (mg/kg)	Remedial Action Goals ^a (mg/kg)			Does the Maximum Result Exceed RAGs?	Does the Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Antimony	1.0 (<BG)	32	5 ^c	5 ^c	No	--
Arsenic	2.8 (<BG)	20	20	20	No	--
Barium	167	5,600	132 ^c	224	Yes	Yes ^d
Beryllium	0.29 (<BG)	10.4 ^e	1.5 ^c	1.51 ^c	No	--
Boron	22.8	16,000	320	-- ^f	No	--
Chromium (total)	8.4 (<BG)	80,000	18.5 ^c	18.5 ^c	No	--
Cobalt	6.3 (<BG)	1,600	32	-- ^f	No	--
Copper	17.3 (<BG)	2,960	59.2	22.0 ^c	No	--
Hexavalent chromium	0.26	2.1	4.8	2	No	--
Lead	8.1 (<BG)	353	10.2 ^c	10.2 ^c	No	--
Manganese	277 (<BG)	11,200	512 ^c	512 ^c	No	--
Mercury	0.10 (<BG)	24	0.33 ^c	0.33 ^c	No	--
Molybdenum	1.3	400	8	-- ^f	No	--
Nickel	10.5 (<BG)	1,600	19.1 ^c	27.4	No	--
Vanadium	39.6 (<BG)	560	85.1 ^c	-- ^f	No	--
Zinc	44.7 (<BG)	24,000	480	67.8 ^c	No	--
Anthracene	0.022	24,000	240	1,920	No	--
Benzo(a)anthracene	0.100	1.37 ^g	0.33 ^h	0.33 ^h	No	--
Benzo(a)pyrene	0.110	0.33 ^h	0.33 ^h	0.33 ^h	No	--
Benzo(b)fluoranthene	0.089	1.37 ^g	0.33 ^h	0.33 ^h	No	--
Benzo(ghi)perylene ⁱ	0.070	2,400	48	192	No	--
Benzo(k)fluoranthene	0.097	13.7 ^g	0.33 ^h	0.33 ^h	No	--
Bis(2-ethylhexyl)phthalate	0.273	71.4	0.6	0.36	No	--

Table 18. Comparison of Maximum Contaminant Concentrations to Action Levels for the 100-F-26:9 Overburden Stockpile Verification Sampling Event. (2 Pages)

COC/COPC	Maximum Result (mg/kg)	Remedial Action Goals ^a (mg/kg)			Does the Maximum Result Exceed RAGs?	Does the Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Chrysene	0.140	137 ^g	1.2 ^g	0.33 ^h	No	--
Dibenz(a,h)anthracene	0.022	0.33 ^h	0.33 ^h	0.33 ^h	No	--
Fluoranthene	0.220	3,200	64	18.0	No	--
Indeno(1,2,3-cd)pyrene	0.071	1.37	0.33 ^h	0.33 ^h	No	--
2-methylnaphthalene	0.027	320	3.2	NA	No	--
Naphthalene	0.018	1,600	16.0	988	No	--
Phenanthrene ⁱ	0.110	24,000	240	1,920	No	--
Pyrene	0.260	2,400	48	192	No	--
Aroclor-1254	0.045	0.5	0.017 ^h	0.017 ^h	Yes	Yes ^d
Aroclor-1260	0.180	0.5	0.017 ^h	0.017 ^h	Yes	Yes ^d

^a Lookup values and RAGs obtained from the 100 Area RDR/RAWP (DOE-RL 2005b) or calculated per WAC 173-340-720, WAC 173-340-730, and WAC 173-340-740, Method B, 1996, unless otherwise noted.

^b The 100 Area RDR/RAWP (DOE-RL 2005) does not provide soil cleanup levels for this contaminant to be protective of groundwater and the Columbia River. Based on the soil partitioning distribution coefficient for cesium-137 of 50 mL/g, this contaminant is not predicted to migrate more than 1 m (3.3 ft) vertically in 1,000 years (BHI 2005a). The vadose zone underlying this pipeline site is approximately 5 m (16 ft) thick. Therefore, residual concentrations of this contaminant are predicted to be protective of groundwater and the Columbia River.

^c Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996).

^d Based on the *100 Area Analogous Sites RESRAD Calculations* (BHI 2005a), residual concentrations are not expected to migrate more than 2 m (6.6 ft) vertically in 1,000 years (based on the lowest soil-partitioning distribution coefficient [barium] of 25 mL/g). The vadose zone underlying the remediation footprint is approximately 5 m (16 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

^e Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) and an airborne particulate mass-loading rate of 0.0001 g/m³ (WDOH 1997).

^f No cleanup level is available from the *Cleanup Levels and Risk Calculations Database* (Ecology 2005), and/or no bioconcentration factor or ambient water quality criteria values are available to calculate cleanup levels (WAC 173-340-730(3)(a)(iii), 1996 [Method B for surface waters]).

^g Cleanup level calculated with updated toxicity values using the appropriate formulas from WAC 173-340-740 (Ecology 1996). Updated toxicity values are available from the EPA Integrated Risk Information System at < <http://www.epa.gov/iris> > or from the Risk Assessment Information System database of the Oak Ridge National Laboratory on the Internet at < <http://risk.lsd.ornl.gov> >.

^h Where cleanup levels are less than RDLs, cleanup levels default to RDLs (WAC 173-340-707(2), 1996 and DOE-RL 2005b).

ⁱ Toxicity data for this chemical are not available. Cleanup levels are based on the following surrogate chemicals: Contaminant: benzo(g,h,i)perylene, surrogate: pyrene; phenanthrene, surrogate: anthracene.

-- = not applicable

BG = background

COC = contaminant of concern

COPC = contaminant of potential concern

EPA = U.S. Environmental Protection Agency

RAG = remedial action goal

RDL = required detection limit

RDR/RAWP = Remedial Design Report/Remedial Action Work Plan for the 100 Area

RESRAD = RESidual RADioactivity (dose assessment model)

WAC = Washington Administrative Code

Table 19. Comparison of Statistical Contaminant Concentrations to Action Levels for the 100-F-26:9 Staging Pile Footprint Verification Sampling Event. (2 Pages)

COC/COPC	Statistical Result (mg/kg)	Remedial Action Goals ^a (mg/kg)			Does the Maximum Result Exceed RAGs?	Does the Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Arsenic	6.7 (<BG)	20	20	20	No	--
Barium	58.7 (<BG)	5,600	132 ^b	224	No	--
Beryllium	0.46 (<BG)	10.4 ^c	1.5 ^b	1.51 ^b	No	--
Boron	1.8	16,000	320	-- ^d	No	--
Chromium (total)	10.4 (<BG)	80,000	18.5 ^b	18.5 ^b	No	--
Cobalt	5.8 (<BG)	1,600	32	-- ^d	No	--
Copper	15.5 (<BG)	2,960	59.2	22.0 ^b	No	--
Hexavalent chromium	0.23	2.1	4.8	2	No	--
Lead	20.2	353	10.2 ^b	10.2 ^b	Yes	Yes ^e
Manganese	264 (<BG)	11,200	512 ^b	512 ^b	No	--
Mercury	0.12 (<BG)	24	0.33 ^b	0.33 ^b	No	--
Molybdenum	0.75	400	8	-- ^d	No	--
Nickel	11.1 (<BG)	1,600	19.1 ^b	27.4	No	--
Vanadium	30.6 (<BG)	560	85.1 ^b	-- ^d	No	--
Zinc	36.3 (<BG)	24,000	480	67.8 ^b	No	--
Endrin	0.0026	24	0.2	0.039	No	--
DDE, 4,4'-	0.0029	2.94	0.0257	0.0033 ^g	No	--
beta-BHC	0.0039	0.556	0.00486	0.00554	No	--
alpha-Chlordane	0.0027	2.86 ^f	0.02 ^g	0.02 ^g	No	--
gamma-Chlordane	0.0026	2.86 ^f	0.02 ^g	0.02 ^g	No	--
TPH	418	-- ^d	200	200	Yes	Yes ^h
Anthracene	0.026	24,000	240	1,920	No	--
Benzo(a)anthracene	0.120	1.37 ^f	0.33 ^g	0.33 ^g	No	--
Benzo(a)pyrene	0.140	0.33 ^g	0.33 ^g	0.33 ^g	No	--
Benzo(b)fluoranthene	0.075	1.37 ^f	0.33 ^g	0.33 ^g	No	--
Benzo(ghi)perylene ⁱ	0.087	2,400	48	192	No	--
Benzo(k)fluoranthene	0.120	13.7 ^f	0.33 ^g	0.33 ^g	No	--
Bis(2-ethylhexyl)phthalate	0.245	71.4	0.6	0.36	No	--
Chrysene	0.160	137 ^f	1.2 ^f	0.33 ^g	No	--

Table 19. Comparison of Statistical Contaminant Concentrations to Action Levels for the 100-F-26:9 Staging Pile Footprint Verification Sampling Event. (2 Pages)

COC/COPC	Statistical Result (mg/kg)	Remedial Action Goals ^a (mg/kg)			Does the Maximum Result Exceed RAGs?	Does the Result Pass RESRAD Modeling?
		Direct Exposure	Soil Cleanup Level for Groundwater Protection	Soil Cleanup Level for River Protection		
Di-n-butylphthalate	0.026	8,000	160	540	No	--
Fluoranthene	0.200	3,200	64	18.0	No	--
Indeno(1,2,3-cd)pyrene	0.083	1.37	0.33 ^g	0.33 ^g	No	--
Phenanthrene ⁱ	0.150	24,000	240	1,920	No	--
Pyrene	0.260	2,400	48	192	No	--
Aroclor-1254	0.023	0.5	0.017 ^g	0.017 ^g	Yes	Yes ^e
Aroclor-1260	0.019	0.5	0.017 ^g	0.017 ^g	Yes	Yes ^e

^a Lookup values and RAGs obtained from the 100 Area RDR/RAWP (DOE-RL 2005b) or calculated per WAC 173-340-720, WAC 173-340-730, and WAC 173-340-740, Method B, 1996, unless otherwise noted.

^b Where cleanup levels are less than background, cleanup levels default to background (WAC 173-340-700[4][d], 1996).

^c Carcinogenic cleanup level calculated based on the inhalation exposure pathway (WAC 173-340-750[3], 1996) and an airborne particulate mass-loading rate of 0.0001 g/m³ (WDOH 1997).

^d No cleanup level is available from the *Cleanup Levels and Risk Calculations (CLARC) Database* (Ecology 2005), and/or no bioconcentration factor or ambient water quality criteria values are available to calculate cleanup levels (WAC 173-340-730(3)(a)(iii), 1996 [Method B for surface waters]).

^e Based on the *100 Area Analogous Sites RESRAD Calculations* (BHI 2005a), residual concentrations are not expected to migrate more than 2 m (6.6 ft) vertically in 1,000 years (based on the lowest soil-partitioning distribution coefficient [lead] of 30 mL/g). The vadose zone underlying the staging pile footprint is approximately 5 m (16 ft) thick. Therefore, residual concentrations of these contaminants are predicted to be protective of groundwater and the Columbia River.

^f Cleanup level calculated with updated toxicity values using the appropriate formulas from WAC 173-340-740 (Ecology 1996). Updated toxicity values are available from the EPA Integrated Risk Information System (IRIS) at < <http://www.epa.gov/iris> > or from the Risk Assessment Information System database of the Oak Ridge National Laboratory (ORNL) on the Internet at < <http://risk.lsd.ornl.gov> >.

^g Where cleanup levels are less than RDLs, cleanup levels default to RDLs (WAC 173-340-707(2), 1996 and DOE-RL 2005b).

^h A layer of soil (0.3 m [1 ft]) was removed from the area associated with sample SP-6. The 190-F building foundation was encountered precluding the collection of a replacement sample for SP-6. The TPH contaminated soil was removed in its entirety since the foundation is expected to have inhibited its migration deeper.

ⁱ Toxicity data for this chemical are not available. Cleanup levels are based on the following surrogate chemicals: Contaminant: benzo(g,h,i)perylene, surrogate: pyrene; phenanthrene, surrogate: anthracene.

-- = not applicable

BG = background

COPC = contaminant of potential concern

COC = contaminant of concern

EPA = U.S. Environmental Protection Agency

RAG = remedial action goal

RDL = required detection limit

RDR/RAWP = Remedial Design Report/Remedial Action Work Plan for the 100 Area

RESRAD = RESidual RADioactivity (dose assessment model)

WAC = Washington Administrative Code

DATA EVALUATION

Evaluation of the results listed in Tables 17, 18 and 19 indicates nine 100-F-26:9 (service areas 2, 9, 10, and 11) pipeline site contaminants exceed the soil RAGs for the protection of groundwater and the Columbia River in one or more of the decision units. The contaminants include barium, copper, lead, selenium, silver, zinc, bis(2-ethylhexyl phthalate), TPH, Aroclor-1254, and Aroclor-1260. The elevated TPH concentration was in a single sample (SP-6) from the staging pile footprint. A layer of soil (0.3 m [1 ft]) was removed from the area associated with sample SP-6. The 190-F building foundation was encountered precluding the collection of a replacement sample for SP-6 (Figure 24). The TPH contaminated soil was removed in its entirety since the foundation is expected to have inhibited its migration deeper.

Data was not collected on the vertical extent of residual contamination associated with the other analytes, but, given the lowest soil-partitioning coefficient (copper is the lowest, at 22 mL/g), RESRAD modeling (BHI 2005a) predicts that these contaminants will not migrate more than 3 m (10 ft) vertically in 1,000 years. The vadose zone beneath the 100-F-26:9 excavation is approximately 5 m (16 ft) thick. Therefore, residual concentrations of these contaminants are protective of groundwater. The only pathway for contamination to reach the Columbia River is via groundwater migration, so these contaminant concentrations are also protective of river water. All other contaminants for the 100-F-26:9 (service areas 2, 9, 10, and 11) pipeline site were either not detected or quantified below RAGs. All of the residual contaminant concentrations were below the direct exposure RAGs.

When using a statistical sampling approach, a RAG requirement for nonradionuclides is the WAC 173-340-740(7)(e) three-part test. The application of the three-part test for the 100-F-26:9 (service areas 2, 9, 10, and 11) three decision units is included in the statistical calculations (Appendix C). All residual COC/COPC concentrations for the 100-F-26:9 remediation footprint pass the three-part test. All residual COC/COPC concentrations for the 100-F-26:9 overburden stockpile pass the three-part test, except for barium. As noted above, barium is not predicated to migrate more than 2 m (6.6 ft) vertically in 1,000 years. Therefore, residual concentrations of barium within these sampling areas are also protective of groundwater and the Columbia River. All residual COC/COPC concentrations for the 100-F-26:9 staging pile footprint pass the three-part test, except for lead and bis(2-ethylhexyl)phthalate. As noted above, lead and bis(2-ethylhexyl)phthalate are not predicated to migrate more than 2 m (6.6 ft) vertically in 1,000 years. Therefore, residual concentrations of lead and bis(2-ethylhexyl)phthalate within these sampling areas are also protective of groundwater and the Columbia River.

Assessment of the risk requirements for the 100-F-26:9 (service areas 2, 9, 10, and 11) pipeline site is determined by calculation of the hazard quotient and carcinogenic (excess cancer) risk values for nonradionuclides. These calculations are located in Appendix C. The requirements include an individual hazard quotient of less than 1.0, a cumulative hazard quotient of less than 1.0, an individual contaminant carcinogenic risk of less than 1×10^{-6} , and a cumulative excess carcinogenic risk of less than 1×10^{-5} . These risk values were conservatively calculated by using the highest value from the excavation footprint and overburden stockpile for each of the analytes. A separate calculation was performed for the staging pile footprint verification samples.

Risk values were not calculated for constituents that were not detected or were detected at concentrations below Hanford Site or Washington State background values. Table 20 provides a summary of the risk values calculated for the decision units. The calculations indicated that all individual hazard quotients for noncarcinogenic constituents are less than 1.0. The maximum cumulative hazard quotient for the 100-F-26:9 (service areas 2, 9, 10, and 11) pipeline site is 1.9×10^{-1} . All individual cumulative carcinogenic risk values are less than 1×10^{-6} . The maximum cumulative carcinogenic risk value is 2.1×10^{-6} . Therefore, nonradionuclide risk requirements are met.

Figure 24. 190-F Building Foundation Encountered During Removal of TPH Contaminated Soils Near Verification Sample SP-6.

Table 20. Summary of Cumulative Risk and Achievement of Remedial Action Goals for 100-F-26:9 (Service Areas 2, 9, 10, and 11) Pipeline Site Following Verification Sampling.

Decision Unit	Comment	Cumulative Hazard Quotient	Cumulative Carcinogenic Risk	Disposition
RAG		1.0	1.0E-05	--
Excavation footprint	--	0.19	2.1E-06	Achieved RAGs
Overburden stockpile	See note	--	--	--
Staging pile footprint	--	0.018	1.4E-06	Achieved RAGs

Note: Hazard quotient and risk calculations for the overburden stockpile were included with the excavation footprint decision unit.

-- = not applicable

RAG = remedial action goals

DATA QUALITY ASSESSMENT

A data quality assessment (DQA) was performed to compare the confirmatory and verification sampling approaches and resulting analytical data with the sampling and data quality requirements specified by the project objectives and performance specifications. The DQA for the 100-F-26:9 pipeline site established that the data are of the right type, quality, and quantity to support site verification decisions within specified error tolerances. All analytical data were found to be acceptable for decision-making purposes. The evaluation verified that the sample design was sufficient for the purpose of clean site verification. The detailed DQA is presented in Appendix E.

SUMMARY FOR INTERIM CLOSURE

The 100-F-26:9 pipeline site has been evaluated and remediated in accordance with the Remaining Sites ROD (EPA 1999) and the RDR/RAWP (DOE-RL 2005b). Confirmatory sampling results supported no action for seven of the 11 service areas. The remaining four service areas (2, 9, 10, and 11) were remediated by removing approximately 1,360 BCM (1,780 BCY) of material for disposal at the ERDF. Statistical and judgmental sampling to verify the completeness of remediation was performed, and analytical results for the three decision units (excavation footprint, overburden stockpiles and staging pile footprint) were shown to meet the cleanup objectives for direct exposure, groundwater protection, and river protection. Accordingly, an interim closure reclassification is supported for the 100-F-26:9 pipeline site. The site does not have a deep zone or residual contaminant concentrations that would require any institutional controls.

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APPENDIX A

**PHOTOGRAPHS OF CONFIRMATORY SAMPLING
AND REMEDIATION ACTIVITIES**

SERVICE AREA 1 (TEST PIT 19)

Junction Box Debris 1.2 m (4 ft) Below Ground Surface (bgs).

Section of 20 cm (8 in.) North-South Vitriified Clay Pipe (VCP) Staged for Sampling.

Section of 10 cm (4 in.) Cast-Iron Discovery Pipe Located in Excavation Sidewall.

Close-Up Photograph of 10 cm (4 in.) Cast-Iron Discovery Pipe.

Concrete Encased Section of 15 cm (6 in.) East-West VCP Removed for Sampling.

Remnants of Junction Box that was Previously Demolished in Place.

Junction Box Foundation Removed for Collection of Soil Sample Below.

Soil Sample (J025K5) Location from Under Junction Box Baseplate After Removal.

Junction Box Foundation.

Sediment Sampled (J025K4) Inside Concrete Encased VCP.

SERVICE AREA 2 (TEST PIT 12)

**Interior of 20 cm (8 in.) VCP Containing a Small Amount of
Debris from Excavation. No Sediment is Present.**

Junction Box Being Backfilled Early in the Morning.

SERVICE AREA 3 (TEST PIT 8)

Excavation Exposes Junction Box and Concrete Encased 15 cm (6 in.) VCP.

Contents of 15 cm (6 in.) VCP.

RCT Screening Soil from Below Junction Box.

VCP Broken Into Smaller Pieces for Sampling (J025K9).

SERVICE AREA 4 (TEST PIT 22)

Test Pit 22 (20 m [65 ft] North of Original Stake Location).

VCP 20 cm (8 in.) Encased in Concrete.

VCP 20 cm (8 in.) Encased in Concrete 2.4 m (8 ft) bgs.

Concrete Encased VCP Removed for Sampling.

SERVICE AREA 5 (TEST PIT 28)

Junction Box Covered Prior to Sampling.

Soil Sample (J026D1) Location Below Junction Box.

SERVICE AREA 6 (TEST PIT 40)

Sediment in Junction Box Prior to Sampling.

Collection Device for Obtaining Samples from the Bottom of the Junction Box.

Technique and Collection Device Used to Obtain Sediment Sample (J025J6).

Sediment Remaining Following Sampling.

Sediment Sample Collected from the Bottom of the Junction Box (J025J6).

Location of Soil Sample (J025J7) Taken Below Junction Box and Effluent Pipe.

Soil Sample (J025J7) Taken Below Junction Box and Effluent Pipe.

SERVICE AREA 7 (TEST PIT 24)

Test Pit 24, 1.8 m (6 ft) bgs.

VCP 15 cm (6 in.) Contained No Sediment.

VCP 15 cm (6 in.) Contained No Sediment.

Concrete Encased VCPs 15 cm (6 in.) and 20 cm (8 in.) Visible in Bottom of Test Pit.

Soil from Beneath Removed Section of VCP Staged for Sampling.

SERVICE AREA 8 (TEST PIT 25)

Concrete Discovered at 1.5 m (5 ft) bgs.

Concrete Appears to be a Layer Rather Than a Block.

VCP 15 cm (6 in.) is Visible Below Concrete Layer.

VCP 15 cm (6 in.) is Not Completely Encased in Concrete.

RCT Screening Soil Sampled (J025J8) from Excavator Bucket.

Soil Sample (J025J8).

Pieces of VCP Being Prepared for Sampling.

SERVICE AREA 9 (TEST PIT 27)

Sediment and Debris Inside 15 cm (6 in.) VCP.

Sediment Sample (J025K6) Collected from Inside VCP.

SERVICE AREA 10 (TEST PIT 21)

Junction Box Sediment Visible 3.7 m (12 ft) bgs.

Sediment Sample (J025J1) Being Collected from Bottom of Junction Box.

Stockpile of Excavated Material from Test Pit 21.

North Side of Junction Box with Effluent Pipe.

SERVICE AREA 10 (TEST PIT 23)

Sediment Sample (J025J3) Being Collected 3.7 m (12 ft) bgs.

Soil Sample (J025J4) Collected Below Junction Box Foundation.

SERVICE AREA 11 (TEST PIT 26)

Section of 20 cm (8 in.) Concrete Encased VCP Found Loose in Test Pit.

VCP was Buried 1.5 m (5 ft) bgs.

Soil Sample (J025J9) location.

Excavated Material Used to Obtain Soil Sample (J025J9).

Concrete Encased 20 cm (8 in.) VCP was Breached to Obtain Sediment Sample.

Sediment Sample (J025K0).

CORRECTIVE ACTION

Stockpiling Overburden from 100-F-26:9 Pipeline Subsite.

Steel Sodium Dichromate 5.1 cm (2 in.) Pipeline (100-F-26:7) was Breached.

**Approximately Five Gallons of Yellowish-Green Liquid
was Released Into the Excavation.**

**Breached 100-F-26:7 Pipeline in Foreground of
100-F-26:9 Pipeline Excavation.**

Load Out of 100-F-26:9 Pipeline and Soil.

Excavation of 100-F-26:9 Continues.

**Excavated Service Line from Former 184-F Building
(October 24, 2007).**

**Load Out of Soil and Debris from 100-F-26:9 Service Area 11
(October 25, 2007).**

**Service Area 11 Excavation that Cut Through South Parking Lot
(October 25, 2007).**

Excavation of 100-F-26:9 Pipeline is Backfilled (April 15, 2008)

**Contaminated Soil at 100-F-26:9 Removed Beneath Area
Related to Sample SP-6. Portion of 190-F Building
Foundation was Uncovered (April 9, 2008).**

APPENDIX B

100-F-26:9 DATA SUMMARY TABLES

Table B-1. 100-F-26:9 Radionuclide Data Results. (4 Pages)

Sample Location	HEIS Number	Sample Date	Americium-241			Americium-241 GEA			Antimony-125			Barium-133			Cesium-137			Cobalt-60		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Test pit 21, junction box contents	J025J1	12/27/04	0.045		0.045	0.2	U	0.2	0.12	U	0.12	0.051	U	0.051	0.602		0.068	0.063		0.042
Test pit 21, soil under junction box	J025J2	12/27/04	-0.03	U	0.051	0.15	U	0.15	0.095	U	0.095	0.05	U	0.05	0.042	U	0.042	0.048	U	0.048
Test pit 23, junction box contents	J025J3	12/27/04	0.014	U	0.048	0.3	U	0.3	0.088	U	0.088	0.042	U	0.042	0.175		0.047	0.049	U	0.049
Test pit 23, soil under junction box	J025J4	12/27/04	0.023	U	0.043	0.35	U	0.35	0.098	U	0.098	0.044	U	0.044	0.045	U	0.045	0.053	U	0.053
Test pit 24, soil under pipe	J025J5	12/27/04	0.015	U	0.028	0.18	U	0.18	0.11	U	0.11	0.043	U	0.043	0.172		0.066	0.054	U	0.054
Test pit 40, junction box contents	J025J6	12/28/04	0.186	U	0.24	0.31	U	0.31	0.082	U	0.082	0.04	U	0.04	0.043	U	0.043	0.044	U	0.044
Test pit 40, soil under junction box	J025J7	12/28/04	0.149	U	0.28	0.27	U	0.27	0.072	U	0.072	0.036	U	0.036	0.036	U	0.036	0.036	U	0.036
Test pit 25, soil under pipe	J025J8	12/28/04	0.03	U	0.23	0.26	U	0.26	0.15	U	0.15	0.066	U	0.066	0.062	U	0.062	0.065	U	0.065
Test pit 26, soil under junction box	J025J9	12/28/04	-0.029	U	0.22	0.18	U	0.18	0.095	U	0.095	0.043	U	0.043	0.046	U	0.046	0.05	U	0.05
Test pit 26, junction box contents	J025K0	12/28/04	0.03	U	0.23	0.4	U	0.4	0.11	U	0.11	0.05	U	0.05	0.172		0.058	0.052	U	0.052
Test pit 12, junction box contents	J025K1	1/3/05	0	U	0.17	0.19	U	0.19	0.11	U	0.11	0.053	U	0.053	0.294		0.065	0.053	U	0.053
Test pit 12, soil under junction box	J025K2	1/3/05	-0.046	U	0.17	0.33	U	0.33	0.09	U	0.09	0.042	U	0.042	0.037	U	0.037	0.047	U	0.047
Test pit 12, duplicate J025K2	J025K3	1/3/05	-0.022	U	0.17	0.3	U	0.3	0.081	U	0.081	0.039	U	0.039	0.036	U	0.036	0.043	U	0.043
Test pit 19, junction box contents	J025K4	1/3/05	0	U	0.19	0.18	U	0.18	0.1	U	0.1	0.046	U	0.046	0.047	U	0.047	0.065	U	0.065
Test pit 19, soil under junction box	J025K5	1/3/05	0.024	U	0.18	0.28	U	0.28	0.074	U	0.074	0.036	U	0.036	0.086		0.038	0.034	U	0.034
Test pit 28, soil under junction box	J026D1	1/3/05	-0.075	U	0.19	0.18	U	0.18	0.11	U	0.11	0.047	U	0.047	0.045	U	0.045	0.059	U	0.059
Test pit 28, junction box contents	J026D2	1/3/05	0	U	0.16	0.39	U	0.39	0.11	U	0.11	0.052	U	0.052	0.219		0.067	0.054	U	0.054
Test pit 27, soil under junction box	J026D4	1/6/05	0.024	U	0.19	0.3	U	0.3	0.078	U	0.078	0.037	U	0.037	0.036	U	0.036	0.04	U	0.04
Test pit 8, soil under junction box	J02D75	1/13/05				0.3	U	0.3							0.11	U	0.11	0.038	U	0.038
Test pit 22, soil under junction box	J02D76	1/13/05				0.3	U	0.3							0.035	U	0.035	0.037	U	0.037
Test pit 27, junction box contents	J025K6	1/6/05	0	U	0.2	0.26	U	0.26							0.159		0.13	0.13	U	0.13
Test pit 24, pipe contents	J025K8	1/10/05	0.089	U	0.17	0.5	U	0.5							0.11	U	0.11	0.054	U	0.054
Test pit 8, junction box/elbow contents	J025K9	1/13/05	0.022	U	0.17	0.5	U	0.5							0.096	U	0.096	0.085	U	0.085
Test pit 22, junction box contents	J025L0	1/13/05	0.047	U	0.18	0.63	U	0.63							0.13	U	0.13	0.13	U	0.13
Test pit 25, pipe contents	J025P9	12/28/04	0	U	0.26	0.3	U	0.3							0.12	U	0.12	0.1	U	0.1

Acronyms and notes apply to all of the tables in this appendix

Note: Data qualified with C, D, and/or J are considered acceptable values.

B	= blank contamination (organic constituents)	MDA	= minimum detectable activity
C	= blank contamination (inorganic constituents)	TP	= Test pit
GEA	= gamma energy analysis	PQL	= practical quantitation limit
HEIS	= Hanford Environmental Information System	Q	= qualifier
J	= estimate	U	= undetected

Table B-1. 100-F-26:9 Radionuclide Data Results. (4 Pages)

Sample Location	HEIS Number	Sample Date	Europium-152			Europium-154			Europium-155			Gross alpha			Gross beta			Potassium-40		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Test pit 21, junction box contents	J025J1	12/27/04	0.752		0.13	0.2	U	0.2	0.14	U	0.14	7.86		2.7	11.2		6.9	4.8		0.31
Test pit 21, soil under junction box	J025J2	12/27/04	0.097	U	0.097	0.16	U	0.16	0.11	U	0.11	6.25		5.8	21.6		5.5	15.6		0.38
Test pit 23, junction box contents	J025J3	12/27/04	0.11	U	0.11	0.15	U	0.15	0.14	U	0.14	-5.14	U	9	16.5		5.9	13.3		0.32
Test pit 23, soil under junction box	J025J4	12/27/04	0.11	U	0.11	0.16	U	0.16	0.15	U	0.15	7.47		3.3	19.4		9.3	17		0.55
Test pit 24, soil under pipe	J025J5	12/27/04	0.14	U	0.14	0.2	U	0.2	0.13	U	0.13	6.96		4.1	15.2		6.1	15.4		0.51
Test pit 40, junction box contents	J025J6	12/28/04	0.098	U	0.098	0.13	U	0.13	0.14	U	0.14	6.23		3.7	15.4		5.4	13.9		0.39
Test pit 40, soil under junction box	J025J7	12/28/04	0.082	U	0.082	0.14	U	0.14	0.12	U	0.12	9.43		4	25.4		5.4	16.5		0.35
Test pit 25, soil under pipe	J025J8	12/28/04	0.15	U	0.15	0.22	U	0.22	0.17	U	0.17	3.44	U	4.6	11.6		5.3	10.1		0.46
Test pit 26, soil under junction box	J025J9	12/28/04	0.12	U	0.12	0.19	U	0.19	0.13	U	0.13	11.3		3.7	19.2		5.5	14.2		0.54
Test pit 26, junction box contents	J025K0	12/28/04	0.14	U	0.14	0.17	U	0.17	0.17	U	0.17	4.08	U	5.6	18.6		5.5	16.3		0.36
Test pit 12, junction box contents	J025K1	1/3/05	0.12	U	0.12	0.16	U	0.16	0.2	U	0.2	7.57		3.6	16.1		5.4	10.7		0.57
Test pit 12, soil under junction box	J025K2	1/3/05	0.1	U	0.1	0.17	U	0.17	0.14	U	0.14	11.1		3.9	16.7		5.3	15.1		0.44
Test pit 12, duplicate J025K2	J025K3	1/3/05	0.1	U	0.1	0.14	U	0.14	0.13	U	0.13	4.08	U	4.7	14.2		5.4	15.7		0.34
Test pit 19, junction box contents	J025K4	1/3/05	0.11	U	0.11	0.15	U	0.15	0.12	U	0.12	8.32		4.7	15		5.4	15		0.52
Test pit 19, soil under junction box	J025K5	1/3/05	0.087	U	0.087	0.13	U	0.13	0.13	U	0.13	2.23	U	4.6	15.1		5.5	14		0.29
Test pit 28, soil under junction box	J026D1	1/3/05	0.11	U	0.11	0.17	U	0.17	0.13	U	0.13	10.1		3.4	17.9		5.3	15.7		0.52
Test pit 28, junction box contents	J026D2	1/3/05	0.13	U	0.13	0.18	U	0.18	0.17	U	0.17	1.76	U	6.1	16.7		5.6	14.7		0.46
Test pit 27, soil under junction box	J026D4	1/6/05	0.091	U	0.091	0.14	U	0.14	0.13	U	0.13	4.56		4.1	19.5		5.5	14.4		0.36
Test pit 8, soil under junction box	J02D75	1/13/05	0.091	U	0.091	0.14	U	0.14	0.13	U	0.13	16.7		5.8	17.6		5.6	15.3		0.34
Test pit 22, soil under junction box	J02D76	1/13/05	0.091	U	0.091	0.13	U	0.13	0.13	U	0.13	7.05		5.6	13.7		5.6	15.6		0.34
Test pit 27, junction box contents	J025K6	1/6/05	0.29	U	0.29	0.38	U	0.38	0.25	U	0.25	5.77		4	12.2		5.4	2.13		1.4
Test pit 24, pipe contents	J025K8	1/10/05	0.26	U	0.26	0.29	U	0.29	0.29	U	0.29	14.3		5.1	17.2		5.3	8.64		1.3
Test pit 8, junction box/elbow contents	J025K9	1/13/05	0.29	U	0.29	0.35	U	0.35	0.3	U	0.3	15.9		4.4	21		5.9	9.54		0.98
Test pit 22, junction box contents	J025L0	1/13/05	0.33	U	0.33	0.38	U	0.38	0.37	U	0.37	10.6		4.6	18.1		5.5	13.8		1.1
Test pit 25, pipe contents	J025P9	12/28/04	0.27	U	0.27	0.36	U	0.36	0.27	U	0.27	11.3		5.8	21.1		5.5	3.8	U	3.8

Table B-1. 100-F-26:9 Radionuclide Data Results. (4 Pages)

Sample Location	HEIS Number	Sample Date	Radium-226			Radium-228			Thorium-228 GEA			Thorium-232 GEA			Total Rad Sr		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Test pit 21, junction box contents	J025J1	12/27/04	0.587		0.12	0.67		0.22	0.417		0.058	0.67		0.22			
Test pit 21, soil under junction box	J025J2	12/27/04	0.559		0.071	0.764		0.21	0.68		0.045	0.764		0.21			
Test pit 23, junction box contents	J025J3	12/27/04	0.527		0.084	0.808		0.17	0.643		0.049	0.808		0.17			
Test pit 23, soil under junction box	J025J4	12/27/04	0.59		0.072	0.754		0.22	0.605		0.054	0.754		0.22			
Test pit 24, soil under pipe	J025J5	12/27/04	0.698		0.091	0.865		0.18	0.663		0.056	0.865		0.18			
Test pit 40, junction box contents	J025J6	12/28/04	0.613		0.078	1.11		0.18	0.603		0.046	1.11		0.18			
Test pit 40, soil under junction box	J025J7	12/28/04	0.579		0.056	0.745		0.17	0.615		0.042	0.745		0.17	-0.016	U	0.27
Test pit 25, soil under pipe	J025J8	12/28/04	0.306		0.12	0.537		0.2	0.45		0.11	0.537		0.2			
Test pit 26, soil under junction box	J025J9	12/28/04	0.504		0.091	0.872		0.2	0.594		0.053	0.872		0.2			
Test pit 26, junction box contents	J025K0	12/28/04	0.682		0.097	0.739		0.23	0.645		0.055	0.739		0.23			
Test pit 12, junction box contents	J025K1	1/3/05	0.719		0.11	0.938		0.24	0.787		0.055	0.938		0.24			
Test pit 12, soil under junction box	J025K2	1/3/05	0.511		0.078	0.82		0.19	0.567		0.046	0.82		0.19			
Test pit 12, duplicate J025K2	J025K3	1/3/05	0.573		0.082	0.861		0.2	0.675		0.046	0.861		0.2			
Test pit 19, junction box contents	J025K4	1/3/05	0.527		0.1	0.659		0.23	0.695		0.051	0.659		0.23			
Test pit 19, soil under junction box	J025K5	1/3/05	0.639		0.064	1.02		0.16	0.583		0.043	1.02		0.16			
Test pit 28, soil under junction box	J026D1	1/3/05	0.534		0.1	0.801		0.22	0.741		0.056	0.801		0.22			
Test pit 28, junction box contents	J026D2	1/3/05	0.712		0.1	0.768		0.22	0.65		0.06	0.768		0.22			
Test pit 27, soil under junction box	J026D4	1/6/05	0.531		0.082	0.615		0.16	0.604		0.046	0.615		0.16			
Test pit 8, soil under junction box	J02D75	1/13/05	0.667		0.068	1.06		0.19	0.749		0.044	1.06		0.19			
Test pit 22, soil under junction box	J02D76	1/13/05	0.492		0.07	0.673		0.18	0.598		0.046	0.673		0.18			
Test pit 27, junction box contents	J025K6	1/6/05	0.353		0.25	0.62	U	0.62	0.229		0.17	0.62	U	0.62			
Test pit 24, pipe contents	J025K8	1/10/05	1.17		0.2	1.05		0.41	1.1		0.13	1.05		0.41			
Test pit 8, junction box/elbow contents	J025K9	1/13/05	1.4		0.18	1.63		0.44	1.37		0.12	1.63		0.44			
Test pit 22, junction box contents	J025L0	1/13/05	1.48		0.21	2.1		0.57	1.74		0.14	2.1		0.57			
Test pit 25, pipe contents	J025P9	12/28/04	1.06		0.25	1.35		0.47	1.26		0.11	1.35		0.47			

Table B-1. 100-F-26:9 Radionuclide Data Results. (4 Pages)

Sample Location	HEIS Number	Sample Date	Uranium-235 GEA			Uranium-238 GEA		
			pCi/g	Q	MDA	pCi/g	Q	MDA
Test pit 21, junction box contents	J025J1	12/27/04	0.2	U	0.2	7	U	7
Test pit 21, soil under junction box	J025J2	12/27/04	0.16	U	0.16	5.8	U	5.8
Test pit 23, junction box contents	J025J3	12/27/04	0.16	U	0.16	5.4	U	5.4
Test pit 23, soil under junction box	J025J4	12/27/04	0.17	U	0.17	5.8	U	5.8
Test pit 24, soil under pipe	J025J5	12/27/04	0.2	U	0.2	6.3	U	6.3
Test pit 40, junction box contents	J025J6	12/28/04	0.16	U	0.16	4.7	U	4.7
Test pit 40, soil under junction box	J025J7	12/28/04	0.14	U	0.14	4.6	U	4.6
Test pit 25, soil under pipe	J025J8	12/28/04	0.21	U	0.21	8.8	U	8.8
Test pit 26, soil under junction box	J025J9	12/28/04	0.18	U	0.18	6.6	U	6.6
Test pit 26, junction box contents	J025K0	12/28/04	0.2	U	0.2	7.1	U	7.1
Test pit 12, junction box contents	J025K1	1/3/05	0.2	U	0.2	5.9	U	5.9
Test pit 12, soil under junction box	J025K2	1/3/05	0.16	U	0.16	5.6	U	5.6
Test pit 12, duplicate J025K2	J025K3	1/3/05	0.16	U	0.16	5.3	U	5.3
Test pit 19, junction box contents	J025K4	1/3/05	0.17	U	0.17	6.4	U	6.4
Test pit 19, soil under junction box	J025K5	1/3/05	0.14	U	0.14	4.1	U	4.1
Test pit 28, soil under junction box	J026D1	1/3/05	0.19	U	0.19	6.2	U	6.2
Test pit 28, junction box contents	J026D2	1/3/05	0.2	U	0.2	5.7	U	5.7
Test pit 27, soil under junction box	J026D4	1/6/05	0.14	U	0.14	4.6	U	4.6
Test pit 8, soil under junction box	J02D75	1/13/05	0.17	U	0.17	4.7	U	4.7
Test pit 22, soil under junction box	J02D76	1/13/05	0.16	U	0.16	4.5	U	4.5
Test pit 27, junction box contents	J025K6	1/6/05	0.37	U	0.37	14	U	14
Test pit 24, pipe contents	J025K8	1/10/05	0.42	U	0.42	10	U	10
Test pit 8, junction box/elbow contents	J025K9	1/13/05	0.43	U	0.43	13	U	13
Test pit 22, junction box contents	J025L0	1/13/05	0.5	U	0.5	17	U	17
Test pit 25, pipe contents	J025P9	12/28/04	0.4	U	0.4	15	U	15

Table B-2. 100-F-26:9 Inorganic Data Results. (5 Pages)

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
Test pit 21, junction box contents	J025J1	12/27/04	6110		5.2	8.4		0.46	21.7		0.43	9420		0.13	0.27		0.02	10.1	C	0.49
Test pit 21, soil under junction box	J025J2	12/27/04	4800		3.1	0.28	U	0.28	2		0.26	45.6		0.04	0.38		0.01	1.1	C	0.3
Test pit 23, junction box contents	J025J3	12/27/04	5190		3.4	0.32		0.3	2.9		0.28	224		0.04	0.49		0.01	11.9	C	0.32
Test pit 23, soil under junction box	J025J4	12/27/04	4740		3.3	0.3	U	0.3	1.9		0.28	49.4		0.04	0.38		0.01	1.5	C	0.32
Test pit 24, soil under pipe	J025J5	12/27/04	5800		2.8	0.38		0.25	2.4		0.27	133		0.04	0.5		0.009	2.7	C	0.27
Test pit 40, junction box contents	J025J6	12/28/04	3200		2.7	0.25	U	0.25	1.1		0.23	82.2		0.04	0.43		0.009	4.1	C	0.26
Test pit 40, soil under junction box	J025J7	12/28/04	4810		3.2	0.28	U	0.28	1.9		0.26	44		0.04	0.36		0.01	0.61	C	0.3
Test pit 25, soil under pipe	J025J8	12/28/04	4160		3.1	0.28		0.28	2.1		0.26	37.9		0.04	0.38		0.01	1.9	C	0.29
Test pit 26, soil under junction box	J025J9	12/28/04	4430		3.3	0.29	U	0.29	1.7		0.27	59.9		0.04	0.45		0.01	0.72	C	0.31
Test pit 26, junction box contents	J025K0	12/28/04	5760		3.5	0.34		0.32	2.4		0.29	139		0.05	0.5		0.01	3.5	C	0.34
Test pit 12, junction box contents	J025K1	01/03/05	9880		3.2	0.458		0.28	2.9	C	0.26	659	C	0.04	1		0.01	130		0.3
Test pit 12, soil under junction box	J025K2	01/03/05	4070		3	0.265	U	0.27	2.2	C	0.25	43.3	C	0.04	0.548		0.009	1.3		0.28
Test pit 12, soil	J025K3	01/03/05	4730		2.7	0.247		0.25	2	C	0.23	43	C	0.04	0.597		0.009	1.1		0.26
Test pit 19, junction box contents	J025K4	01/03/05	4910		3.1	0.296		0.27	2.4	C	0.25	58.4	C	0.04	0.596		0.01	1.4		0.29
Test pit 19, soil under junction box	J025K5	01/03/05	5540		3.1	0.414		0.28	2.8	C	0.26	99.8	C	0.04	0.596		0.01	4.8		0.3
Test pit 28, soil under junction box	J026D1	01/03/05	3340		3	0.311		0.27	2.3	C	0.26	23	C	0.04	0.373		0.01	0.288		0.29
Test pit 28, junction box contents	J026D2	01/03/05	5480		3	0.42		0.27	3.1	C	0.25	198	C	0.04	0.676		0.01	11.5		0.29
Test pit 27, soil under junction box	J026D4	01/06/05	4930		2.9	0.262	U	0.26	2.4	C	0.24	62.7	C	0.04	0.515		0.009	2.4		0.28
Test pit 8, soil under junction box	J02D75	01/13/05	4950		3.1	0.499		0.26	2.6		0.26	94.8		0.04	0.474		0.01	2.6		0.3
Test pit 22, soil under junction box	J02D76	01/13/05	5080		3.1	0.276	U	0.28	2		0.26	57.7		0.04	0.475		0.01	4.2		0.3
Test pit 25, soil under pipe	J025L8	12/28/04																		
Test pit 25, pipe contents	J025P9	12/28/04	1150		3.2	0.37		0.29	1.7		0.26	105	C	0.04	0.07		0.01	7.2		0.31
Test pit 27, junction box contents	J025K6	01/06/05	7410		3.6	8.2		0.32	12.6	C	0.3	1160	C	0.05	0.589		0.01	58.7		0.34
Test pit 24, pipe contents	J025K8	01/10/05	1990		2.8	1		0.25	2		0.23	81.9		0.04	0.21		0.009	7.5		0.27
Test pit 24, pipe contents	J025M4	01/10/05																		
Test pit 8, junction box/elbow contents	J025K9	01/13/05	2080		2.8	0.42		0.25	2.2		0.23	125		0.04	0.17	C	0.009	13.6		0.26
Test pit 8, junction box/elbow contents	J02DD6	01/13/05																		
Test pit 22, junction box contents	J02DD7	01/13/05																		
Test pit 22, junction box contents	J025L0	01/13/05	3000		3.1	1.3		0.27	11.7		0.25	57.9		0.04	0.21		0.01	16.7		0.29

Table B-2. 100-F-26:9 Inorganic Data Results. (5 Pages)

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
Test pit 21, junction box contents	J025J1	12/27/04	7.2		0.05	12700	C	4.6	143	C	0.13	11		0.12	654	C	0.23	33.9	D	33.9
Test pit 21, soil under junction box	J025J2	12/27/04	0.03	U	0.03	4040	C	2.8	9.4	C	0.08	4.3		0.07	11.7	C	0.14	0.3		0.21
Test pit 23, junction box contents	J025J3	12/27/04	0.03	U	0.03	6540	C	3	13.3	C	0.09	5.2		0.07	32.5	C	0.15	0.22	U	0.22
Test pit 23, soil under junction box	J025J4	12/27/04	0.03	U	0.03	3250	C	3	8.8	C	0.09	4.5		0.07	12.8	C	0.15	0.36		0.22
Test pit 24, soil under pipe	J025J5	12/27/04	0.34		0.03	3670	C	2.5	17	C	0.07	5.3		0.06	20	C	0.13	0.21	U	0.21
Test pit 40, junction box contents	J025J6	12/28/04	0.03	U	0.03	3560	C	2.4	6	C	0.07	4.4		0.06	12.5	C	0.12	0.26		0.21
Test pit 40, soil under junction box	J025J7	12/28/04	0.03	U	0.03	4710	C	2.8	9.7	C	0.08	4.3		0.07	11.6	C	0.14	0.21	U	0.21
Test pit 25, soil under pipe	J025J8	12/28/04	0.03	U	0.03	4330	C	2.7	8.9	C	0.08	4.4		0.07	11.7	C	0.14	0.34		0.21
Test pit 26, soil under junction box	J025J9	12/28/04	0.03	U	0.03	2920	C	2.9	6.6	C	0.08	4.9		0.07	9	C	0.15	0.22	U	0.22
Test pit 26, junction box contents	J025K0	12/28/04	0.05		0.03	4800	C	3.1	14.5	C	0.09	5.7		0.08	20.1	C	0.16	0.4		0.23
Test pit 12, junction box contents	J025K1	01/03/05	0.082	C	0.03	15200	C	2.8	6.8	C	0.08	5.2		0.07	29	C	0.14	0.281		0.21
Test pit 12, soil under junction box	J025K2	01/03/05	0.028	U	0.03	4960	C	2.6	6.8	C	0.08	4.7		0.07	10.9	C	0.13	0.208	U	0.21
Test pit 12, soil	J025K3	01/03/05	0.026	U	0.03	5510	C	2.4	7.9	C	0.07	5.2		0.06	11.4	C	0.12	0.308		0.21
Test pit 19, junction box contents	J025K4	01/03/05	0.029	U	0.03	4450	C	2.7	7.9	C	0.08	5.3		0.07	11.8	C	0.14	0.205	U	0.2
Test pit 19, soil under junction box	J025K5	01/03/05	0.03	U	0.03	6040	C	2.8	9.7	C	0.08	5.5		0.07	13.6	C	0.14	0.258		0.21
Test pit 28, soil under junction box	J026D1	01/03/05	0.029	U	0.03	5340	C	2.7	7.1	C	0.08	4		0.07	12	C	0.13	0.209	U	0.21
Test pit 28, junction box contents	J026D2	01/03/05	0.283		0.03	5340	C	2.7	17.3	C	0.08	6.6		0.07	33.6	C	0.12	0.527		0.21
Test pit 27, soil under junction box	J026D4	01/06/05	0.028	U	0.03	3330	C	2.6	8.7		0.07	5.4		0.07	13.5		0.13	0.214	U	0.21
Test pit 8, soil under junction box	J02D75	01/13/05	0.064		0.03	4540		2.8	12.4	C	0.08	4.6		0.07	15.9		0.14	0.213	U	0.21
Test pit 22, soil under junction box	J02D76	01/13/05	0.06		0.03	4950		2.7	9	C	0.08	4.7		0.07	11.8		0.14	0.253		0.2
Test pit 25, soil under pipe	J025L8	12/28/04																0.35	U	0.35
Test pit 25, pipe contents	J025P9	12/28/04	0.04		0.03	3040	C	2.8	3.6	C	0.08	0.88		0.07	10.4	C	0.14	0.21	U	0.21
Test pit 27, junction box contents	J025K6	01/06/05	167		0.03	15100	C	3.2	27.9		0.09	7.8		0.08	415		0.16			
Test pit 24, pipe contents	J025K8	01/10/05	1.8		0.03	6690		2.5	30	C	0.07	2.6		0.06	48.6		0.13			
Test pit 24, pipe contents	J025M4	01/10/05																0.35	U	0.35
Test pit 8, junction box/elbow contents	J025K9	01/13/05	0.9		0.03	12400		2.5	7.1		0.07	1.4		0.06	26.1		0.12			
Test pit 8, junction box/elbow contents	J02DD6	01/13/05																0.35	U	0.35
Test pit 22, junction box contents	J02DD7	01/13/05																0.35	U	0.35
Test pit 22, junction box contents	J025L0	01/13/05	0.12		0.03	195000		32.7	3.9	C	0.08	1.9		0.07	10		0.14			

Table B-2. 100-F-26:9 Inorganic Data Results. (5 Pages)

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
Test pit 21, junction box contents	J025J1	12/27/04	78100	C	4.6	211		0.36	1270	C	1.1	619	C	0.05	21.2		0.25	25		0.38
Test pit 21, soil under junction box	J025J2	12/27/04	13400	C	2.8	3.1		0.22	3420	C	0.69	212	C	0.03	0.05		0.02	0.4		0.23
Test pit 23, junction box contents	J025J3	12/27/04	18200	C	3	9.6		0.24	3230	C	0.74	224	C	0.03	0.2		0.01	1.7		0.25
Test pit 23, soil under junction box	J025J4	12/27/04	13300	C	3	3		0.23	3420	C	0.74	246	C	0.03	0.03		0.02	0.26		0.25
Test pit 24, soil under pipe	J025J5	12/27/04	17000	C	2.5	13		0.2	3430	C	0.62	250	C	0.03	0.81		0.02	0.51		0.21
Test pit 40, junction box contents	J025J6	12/28/04	14300	C	2.4	4.8		0.19	2380	C	0.61	185	C	0.03	0.02	U	0.02	0.33		0.2
Test pit 40, soil under junction box	J025J7	12/28/04	12700	C	2.8	2.8		0.22	3550	C	0.7	230	C	0.03	0.1		0.02	0.23	U	0.23
Test pit 25, soil under pipe	J025J8	12/28/04	13100	C	2.7	2.2		0.28	3470	C	0.68	217	C	0.03	0.01	U	0.01	0.25		0.23
Test pit 26, soil under junction box	J025J9	12/28/04	14100	C	2.9	2.6		0.23	3200	C	0.72	224	C	0.03	0.02	U	0.02	0.24	U	0.24
Test pit 26, junction box contents	J025K0	12/28/04	16200	C	3.1	15.1		0.25	3820	C	0.78	264	C	0.03	3.5		0.09	0.26	U	0.26
Test pit 12, junction box contents	J025K1	01/03/05	13000	C	2.8	25.2		0.22	4170	C	0.7	199	C	0.03	0.508		0.02	1.4		0.23
Test pit 12, soil under junction box	J025K2	01/03/05	13600	C	2.6	3.3		0.21	3040	C	0.65	222	C	0.03	0.048		0.01	0.442		0.22
Test pit 12, soil	J025K3	01/03/05	15700	C	2.4	3.7		0.19	3340	C	0.6	254	C	0.03	0.033		0.01	0.348		0.2
Test pit 19, junction box contents	J025K4	01/03/05	15100	C	2.7	3.9		0.22	3440	C	0.67	254	C	0.03	0.015	U	0.02	0.366		0.22
Test pit 19, soil under junction box	J025K5	01/03/05	15200	C	2.8	9.6		0.22	3600	C	0.69	224	C	0.03	0.095		0.02	0.711		0.23
Test pit 28, soil under junction box	J026D1	01/03/05	11100	C	2.7	2.8		0.21	3010	C	0.66	186	C	0.03	0.014	U	0.01	0.379		0.22
Test pit 28, junction box contents	J026D2	01/03/05	17300	C	2.7	62.7		0.21	3420	C	0.66	244	C	0.03	10.5		0.76	1.6		0.22
Test pit 27, soil under junction box	J026D4	01/06/05	15800		2.6	5.7		0.21	3360	C	0.65	262		0.03	0.223		0.02	0.459		0.22
Test pit 8, soil under junction box	J02D75	01/13/05	16200		2.8	4.6		0.22	3440		0.68	193		0.03	0.273		0.02	0.756		0.23
Test pit 22, soil under junction box	J02D76	01/13/05	14200		2.7	3.1		0.22	3690		0.68	233		0.03	0.016	U	0.02	0.338		0.23
Test pit 25, soil under pipe	J025L8	12/28/04																		
Test pit 25, pipe contents	J025P9	12/28/04	4130	C	2.8	156		0.22	448	C	0.7	39.7	C	0.03	0.3		0.02	0.69		0.23
Test pit 27, junction box contents	J025K6	01/06/05	26200		3.2	3750		0.25	4750	C	0.79	336		0.03	481		9.3	9.6		0.26
Test pit 24, pipe contents	J025K8	01/10/05	7840		1.7	131		0.2	1360		0.62	85.6		0.03	15.4		0.33	0.95	C	0.21
Test pit 24, pipe contents	J025M4	01/10/05																		
Test pit 8, junction box/elbow contents	J025K9	01/13/05	7550		1.7	17.8		0.19	1030		0.61	94.5		0.03	0.9		0.02	1		0.2
Test pit 8, junction box/elbow contents	J02DD6	01/13/05																		
Test pit 22, junction box contents	J02DD7	01/13/05																		
Test pit 22, junction box contents	J025L0	01/13/05	5110		2.7	23.5		0.21	1570		0.67	73.6		0.03	1.3		0.01	0.29		0.22

Table B-2. 100-F-26:9 Inorganic Data Results. (5 Pages)

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
Test pit 21, junction box contents	J025J1	12/27/04	118		0.2	476	C	3.1	2		0.61	790	C	2.3	7		0.16	195	C	0.84
Test pit 21, soil under junction box	J025J2	12/27/04	8.8		0.12	743	C	1.9	0.37	U	0.37	629	C	1.4	0.1	U	0.1	155	C	0.51
Test pit 23, junction box contents	J025J3	12/27/04	18.1		0.13	852	C	2	0.4	U	0.4	585	C	1.5	0.11	U	0.11	285	C	0.55
Test pit 23, soil under junction box	J025J4	12/27/04	9.2		0.13	690	C	2	0.39	U	0.39	729	C	1.5	0.41		0.11	120	C	0.54
Test pit 24, soil under pipe	J025J5	12/27/04	10.2		0.11	926	C	1.7	0.33	U	0.33	665	C	1.3	0.13		0.09	198	C	0.46
Test pit 40, junction box contents	J025J6	12/28/04	6.2		0.11	483	C	1.7	0.32	U	0.32	379	C	1.2	0.09	U	0.09	197	C	0.45
Test pit 40, soil under junction box	J025J7	12/28/04	10.1		0.12	706	C	1.9	0.38	U	0.38	458	C	1.4	0.1	U	0.1	153	C	0.52
Test pit 25, soil under pipe	J025J8	12/28/04	9.3		0.12	500	C	1.9	0.36	U	0.36	359	C	1.4	0.01	U	0.1	146	C	0.5
Test pit 26, soil under junction box	J025J9	12/28/04	8.3		0.13	954	C	2	0.39	U	0.39	496	C	1.5	0.1	U	0.1	263	C	0.53
Test pit 26, junction box contents	J025K0	12/28/04	16.7		0.14	1500	C	2.1	0.42	U	0.42	576	C	1.6	3.2		0.11	293	C	0.57
Test pit 12, junction box contents	J025K1	01/03/05	8		0.12	945	C	1.9	0.59		0.37	1890	C	1.4	0.101	U	0.1	1640	C	0.51
Test pit 12, soil under junction box	J025K2	01/03/05	7.9		0.11	755	C	1.8	0.35	U	0.35	420	C	1.3	0.095	U	0.09	217	C	0.48
Test pit 12, soil	J025K3	01/03/05	8.4		0.11	823	C	1.7	0.324	U	0.32	341	C	1.2	0.088	U	0.09	240	C	0.46
Test pit 19, junction box contents	J025K4	01/03/05	8.6		0.12	941	C	1.8	0.412		0.36	700	C	1.4	0.098	U	0.1	168	C	0.5
Test pit 19, soil under junction box	J025K5	01/03/05	9.8		0.12	1320	C	1.9	0.37	U	0.37	687	C	1.4	0.1	U	0.1	432	C	0.51
Test pit 28, soil under junction box	J026D1	01/03/05	9		0.12	556	C	1.8	0.355	U	0.36	413	C	1.3	0.096	U	0.1	121	C	0.49
Test pit 28, junction box contents	J026D2	01/03/05	39.4		0.11	1220	C	1.8	0.353	U	0.35	972	C	1.3	0.862		0.1	366	C	0.49
Test pit 27, soil under junction box	J026D4	01/06/05	10.3		0.11	1030	C	1.8	0.347	U	0.35	183		1.3	0.094	U	0.09	142	C	0.48
Test pit 8, soil under junction box	J02D75	01/13/05	9.1		0.12	717	C	1.9	0.365	U	0.36	220		1.4	0.099		0.1	134	C	0.5
Test pit 22, soil under junction box	J02D76	01/13/05	9.9		0.12	710	C	1.9	0.364	U	0.36	118		1.4	0.099	U	0.1	177	C	0.5
Test pit 25, soil under pipe	J025L8	12/28/04																		
Test pit 25, pipe contents	J025P9	12/28/04	3.3		0.12	290		1.9	0.38	UC	0.38	201		1.4	0.11		0.1	368	C	0.52
Test pit 27, junction box contents	J025K6	01/06/05	51.7		0.14	1980	C	2.2	1.3		0.43	351		1.6	7.1		0.11	1400	C	0.59
Test pit 24, pipe contents	J025K8	01/10/05	17.2		0.11	437	C	1.7	0.33	U	0.33	142		1.3	1.2		0.09	441		0.46
Test pit 24, pipe contents	J025M4	01/10/05																		
Test pit 8, junction box/elbow contents	J025K9	01/13/05	4.2		0.11	304	C	1.7	0.33	U	0.33	178		1.2	0.13		0.09	342	C	0.45
Test pit 8, junction box/elbow contents	J02DD6	01/13/05																		
Test pit 22, junction box contents	J02DD7	01/13/05																		
Test pit 22, junction box contents	J025L0	01/13/05	3.2		0.14	562	C	1.8	0.36	U	0.36	1580		1.4	0.27		0.1	583	C	0.5

Table B-2. 100-F-26:9 Inorganic Data Results. (5 Pages)

Sample Location	HEIS Number	Sample Date	Vanadium			Zinc			Total Petroleum Hydrocarbons		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
Test pit 21, junction box contents	J025J1	12/27/04	37.2		0.12	2280	C	0.43	302		56.4
Test pit 21, soil under junction box	J025J2	12/27/04	32.6		0.07	54.1	C	0.13	34.9	U	34.9
Test pit 23, junction box contents	J025J3	12/27/04	33.1		0.07	45.5	C	0.14	71.2		37
Test pit 23, soil under junction box	J025J4	12/27/04	32.2		0.07	39	C	0.14	36.3	U	36.3
Test pit 24, soil under pipe	J025J5	12/27/04	39.1		0.06	122	C	0.12	35.4	U	35.4
Test pit 40, junction box contents	J025J6	12/28/04	35.9		0.06	30.7	C	0.11	75.4		34.5
Test pit 40, soil under junction box	J025J7	12/28/04	30		0.07	35.2	C	0.13	35	U	35
Test pit 25, soil under pipe	J025J8	12/28/04	34.8		0.07	32	C	0.13	34.9	U	34.9
Test pit 26, soil under junction box	J025J9	12/28/04	33.6		0.07	29.3	C	0.14	36.6	U	36.6
Test pit 26, junction box contents	J025K0	12/28/04	34.6		0.08	94.8	C	0.15	38.6	U	38.6
Test pit 12, junction box contents	J025K1	01/03/05	41.8		0.07	72.6	C	0.13	125		34.3
Test pit 12, soil under junction box	J025K2	01/03/05	34.2		0.07	41	C	0.12	34.7	U	34.7
Test pit 12, soil	J025K3	01/03/05	39.7		0.06	42.4	C	0.11	34.6	U	34.6
Test pit 19, junction box contents	J025K4	01/03/05	35.5		0.07	45.7	C	0.13	34.2	U	34.2
Test pit 19, soil under junction box	J025K5	01/03/05	37.7		0.07	83.5	C	0.13	34.3	U	34.3
Test pit 28, soil under junction box	J026D1	01/03/05	26.3		0.07	23.8	C	0.13	34.8	U	34.8
Test pit 28, junction box contents	J026D2	01/03/05	32.5		0.07	93.4	C	0.12	165		35.5
Test pit 27, soil under junction box	J026D4	01/06/05	37.9		0.07	34.2		0.12	35.5	U	35.5
Test pit 8, soil under junction box	J02D75	01/13/05	40.1		0.07	62.8	C	0.13	35.5	U	35.5
Test pit 22, soil under junction box	J02D76	01/13/05	34.1		0.07	29.9	C	0.13	34.1	U	34.1
Test pit 25, soil under pipe	J025L8	12/28/04									
Test pit 25, pipe contents	J025P9	12/28/04	8.3		0.07	37.2		0.13	35.6	U	35.6
Test pit 27, junction box contents	J025K6	01/06/05	46.3		0.08	2090		0.9	1780		446
Test pit 24, pipe contents	J025K8	01/10/05	12.8		0.06	140	C	0.12	39.9		34
Test pit 24, pipe contents	J025M4	01/10/05									
Test pit 8, junction box/elbow contents	J025K9	01/13/05	10.9		0.06	359	C	0.11	76.3		35.6
Test pit 8, junction box/elbow contents	J02DD6	01/13/05									
Test pit 22, junction box contents	J02DD7	01/13/05									
Test pit 22, junction box contents	J025L0	01/13/05	14.1		0.07	79.4	C	0.13	34.6	U	34.6

Table B-3. 100-F-26:9 Organic Data Results. (14 Pages)

Constituent	J025J1, Test Pit 21 Junction Box Contents Sample Date 12/27/04			J025J2, Test Pit 21 Soil Under Junction Box Sample Date 12/27/04			J025J3, Test Pit 23 Junction Box Contents Sample Date 12/27/04			J025J4, Test Pit 23 Soil Under Junction Box Sample Date 12/27/04		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PCBs (Polychlorinated Biphenyls)												
Aroclor-1016	230	U	230	14	U	14	15	U	15	15	U	15
Aroclor-1221	230	U	230	14	U	14	15	U	15	15	U	15
Aroclor-1232	230	U	230	14	U	14	15	U	15	15	U	15
Aroclor-1242	230	U	230	14	U	14	15	U	15	15	U	15
Aroclor-1248	230	U	230	14	U	14	15	U	15	15	U	15
Aroclor-1254	620		230	14	U	14	15	U	15	15	U	15
Aroclor-1260	230	U	230	14	U	14	15	U	15	15	U	15
Semivolatle Organic Analysis (SVOA)												
1,2,4-Trichlorobenzene	560	U	560	350	U	350	370	U	370	360	U	360
1,2-Dichlorobenzene	560	U	560	350	U	350	370	U	370	360	U	360
1,3-Dichlorobenzene	560	U	560	350	U	350	370	U	370	360	U	360
1,4-Dichlorobenzene	560	U	560	350	U	350	370	U	370	360	U	360
2,4,5-Trichlorophenol	1400	U	1400	870	U	870	930	U	930	910	U	910
2,4,6-Trichlorophenol	560	U	560	350	U	350	370	U	370	360	U	360
2,4-Dichlorophenol	560	U	560	350	U	350	370	U	370	360	U	360
2,4-Dimethylphenol	560	U	560	350	U	350	370	U	370	360	U	360
2,4-Dinitrophenol	1400	U	1400	870	U	870	930	U	930	910	U	910
2,4-Dinitrotoluene	560	U	560	350	U	350	370	U	370	360	U	360
2,6-Dinitrotoluene	560	U	560	350	U	350	370	U	370	360	U	360
2-Chloronaphthalene	560	U	560	350	U	350	370	U	370	360	U	360
2-Chlorophenol	560	U	560	350	U	350	370	U	370	360	U	360
2-Methylnaphthalene	560	U	560	350	U	350	370	U	370	360	U	360
2-Methylphenol (cresol, o-)	560	U	560	350	U	350	370	U	370	360	U	360
2-Nitroaniline	1400	U	1400	870	U	870	930	U	930	910	U	910
2-Nitrophenol	560	U	560	350	U	350	370	U	370	360	U	360
3+4 Methylphenol (cresol, m+p)	560	U	560	350	U	350	370	U	370	360	U	360
3,3'-Dichlorobenzidine	560	U	560	350	U	350	370	U	370	360	U	360
3-Nitroaniline	1400	U	1400	870	U	870	930	U	930	910	U	910
4,6-Dinitro-2-methylphenol	1400	U	1400	870	U	870	930	U	930	910	U	910
4-Bromophenylphenyl ether	560	U	560	350	U	350	370	U	370	360	U	360
4-Chloro-3-methylphenol	560	U	560	350	U	350	370	U	370	360	U	360
4-Chloroaniline	560	U	560	350	U	350	370	U	370	360	U	360
4-Chlorophenylphenyl ether	560	U	560	350	U	350	370	U	370	360	U	360
4-Nitroaniline	1400	U	1400	870	U	870	930	U	930	910	U	910
4-Nitrophenol	1400	U	1400	870	U	870	930	U	930	910	U	910
Acenaphthene	41	J	560	350	U	350	370	U	370	360	U	360
Acenaphthylene	100	J	560	350	U	350	370	U	370	360	U	360
Anthracene	310	J	560	350	U	350	40	J	370	360	U	360
Benzo(a)anthracene	990		560	350	U	350	180	J	370	360	U	360
Benzo(a)pyrene	810		560	350	U	350	130	J	370	360	U	360
Benzo(b)fluoranthene	790		560	350	U	350	150	J	370	360	U	360
Benzo(ghi)perylene	440	J	560	350	U	350	130	J	370	360	U	360
Benzo(k)fluoranthene	820		560	350	U	350	150	J	370	360	U	360
Bis(2-chloro-1-methylethyl)ether	560	U	560	350	U	350	370	U	370	360	U	360
Bis(2-Chloroethoxy)methane	560	U	560	350	U	350	370	U	370	360	U	360
Bis(2-chloroethyl) ether	560	U	560	350	U	350	370	U	370	360	U	360
Bis(2-ethylhexyl) phthalate	1100		560	25	J	350	36	J	370	60	J	360
Butylbenzylphthalate	200	J	560	45	J	350	370	U	370	360	U	360
Carbazole	110	J	560	350	U	350	370	U	370	360	U	360
Chrysene	1100		560	350	U	350	200	J	370	360	U	360

Table B-3. 100-F-26:9 Organic Data Results. (14 Pages)

Constituent	J025J1, Test Pit 21 Junction Box Contents Sample Date 12/27/04			J025J2, Test Pit 21 Soil Under Junction Box Sample Date 12/27/04			J025J3, Test Pit 23 Junction Box Contents Sample Date 12/27/04			J025J4, Test Pit 23 Soil Under Junction Box Sample Date 12/27/04		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Analysis (SVOA) (continued)												
Di-n-butylphthalate	180	J	560	350	U	350	370	U	370	35	J	360
Di-n-octylphthalate	560	U	560	350	U	350	370	U	370	360	U	360
Dibenz[a,h]anthracene	240	J	560	350	U	350	46	J	370	360	U	360
Dibenzofuran	560	U	560	350	U	350	370	U	370	360	U	360
Diethylphthalate	560	U	560	33	J	350	370	U	370	360	U	360
Dimethyl phthalate	560	U	560	350	U	350	370	U	370	360	U	360
Fluoranthene	1600		560	350	U	350	370		370	360	U	360
Fluorene	65	J	560	350	U	350	370	U	370	360	U	360
Hexachlorobenzene	560	U	560	350	U	350	370	U	370	360	U	360
Hexachlorobutadiene	560	U	560	350	U	350	370	U	370	360	U	360
Hexachlorocyclopentadiene	560	U	560	350	U	350	370	U	370	360	U	360
Hexachloroethane	560	U	560	350	U	350	370	U	370	360	U	360
Indeno(1,2,3-cd)pyrene	440	J	560	350	U	350	110	J	370	360	U	360
Isophorone	560	U	560	350	U	350	370	U	370	360	U	360
N-Nitroso-di-n-dipropylamine	560	U	560	350	U	350	370	U	370	360	U	360
N-Nitrosodiphenylamine	560	U	560	350	U	350	370	U	370	360	U	360
Naphthalene	560	U	560	350	U	350	370	U	370	360	U	360
Nitrobenzene	560	U	560	350	U	350	370	U	370	360	U	360
Pentachlorophenol	1400	U	1400	870	U	870	930	U	930	910	U	910
Phenanthrene	870		560	350	U	350	164.697	J	370	360	U	360
Phenol	560	U	560	350	U	350	370	U	370	360	U	360
Pyrene	1500		560	350	U	350	330	J	370	360	U	360

Table B-3. 100-F-26:9 Organic Data Results. (14 Pages)

Constituent	J025J5, Test Pit 24 Soil Under Pipe Sample Date 12/27/04			J025J6, Test Pit 40 Junction Box Contents Sample Date 12/28/04			J025J7, Test Pit 40 Soil Under Junction Box Sample Date 12/28/04			J025J8, Test Pit 25 Soil Under Pipe Sample Date 12/28/04		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PCBs (Polychlorinated Biphenyls)												
Aroclor-1016	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1221	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1232	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1242	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1248	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1254	190		14	14	U	14	14	U	14	14	U	14
Aroclor-1260	14	U	14	28		14	14	U	14	14	U	14
Semivolatle Organic Analysis (SVOA)												
1,2,4-Trichlorobenzene	350	U	350	340	U	340	350	U	350	350	U	350
1,2-Dichlorobenzene	350	U	350	340	U	340	350	U	350	350	U	350
1,3-Dichlorobenzene	350	U	350	340	U	340	350	U	350	350	U	350
1,4-Dichlorobenzene	350	U	350	340	U	340	350	U	350	350	U	350
2,4,5-Trichlorophenol	880	U	880	860	U	860	870	U	870	880	U	880
2,4,6-Trichlorophenol	350	U	350	340	U	340	350	U	350	350	U	350
2,4-Dichlorophenol	350	U	350	340	U	340	350	U	350	350	U	350
2,4-Dimethylphenol	350	U	350	340	U	340	350	U	350	350	U	350
2,4-Dinitrophenol	880	U	880	860	U	860	870	U	870	880	U	880
2,4-Dinitrotoluene	350	U	350	340	U	340	350	U	350	350	U	350
2,6-Dinitrotoluene	350	U	350	340	U	340	350	U	350	350	U	350
2-Chloronaphthalene	350	U	350	340	U	340	350	U	350	350	U	350
2-Chlorophenol	350	U	350	340	U	340	350	U	350	350	U	350
2-Methylnaphthalene	350	U	350	340	U	340	350	U	350	350	U	350
2-Methylphenol (cresol, o-)	350	U	350	340	U	340	350	U	350	350	U	350
2-Nitroaniline	880	U	880	860	U	860	870	U	870	880	U	880
2-Nitrophenol	350	U	350	340	U	340	350	U	350	350	U	350
3+4 Methylphenol (cresol, m+p)	350	U	350	340	U	340	350	U	350	350	U	350
3,3'-Dichlorobenzidine	350	U	350	340	U	340	350	U	350	350	U	350
3-Nitroaniline	880	U	880	860	U	860	870	U	870	880	U	880
4,6-Dinitro-2-methylphenol	880	U	880	860	U	860	870	U	870	880	U	880
4-Bromophenylphenyl ether	350	U	350	340	U	340	350	U	350	350	U	350
4-Chloro-3-methylphenol	350	U	350	340	U	340	350	U	350	350	U	350
4-Chloroaniline	350	U	350	340	U	340	350	U	350	350	U	350
4-Chlorophenylphenyl ether	350	U	350	340	U	340	350	U	350	350	U	350
4-Nitroaniline	880	U	880	860	U	860	870	U	870	880	U	880
4-Nitrophenol	880	U	880	860	U	860	870	U	870	880	U	880
Acenaphthene	350	U	350	340	U	340	350	U	350	350	U	350
Acenaphthylene	350	U	350	340	U	340	350	U	350	350	U	350
Anthracene	350	U	350	340	U	340	350	U	350	350	U	350
Benzo(a)anthracene	350	U	350	340	U	340	350	U	350	350	U	350
Benzo(a)pyrene	350	U	350	340	U	340	350	U	350	350	U	350
Benzo(b)fluoranthene	350	U	350	340	U	340	350	U	350	350	U	350
Benzo(ghi)perylene	350	U	350	340	U	340	350	U	350	350	U	350
Benzo(k)fluoranthene	350	U	350	340	U	340	350	U	350	350	U	350
Bis(2-chloro-1-methylethyl)ether	350	U	350	340	U	340	350	U	350	350	U	350
Bis(2-Chloroethoxy)methane	350	U	350	340	U	340	350	U	350	350	U	350
Bis(2-chloroethyl) ether	350	U	350	340	U	340	350	U	350	350	U	350
Bis(2-ethylhexyl) phthalate	61	J	350	30	J	340	49	J	350	31	J	350
Butylbenzylphthalate	350	U	350	340	U	340	48	J	350	49	J	350
Carbazole	350	U	350	340	U	340	350	U	350	350	U	350
Chrysene	350	U	350	340	U	340	350	U	350	350	U	350

Table B-3. 100-F-26:9 Organic Data Results. (14 Pages)

Constituent	J025J5, Test Pit 24 Soil Under Pipe Sample Date 12/27/04			J025J6, Test Pit 40 Junction Box Contents Sample Date 12/28/04			J025J7, Test Pit 40 Soil Under Junction Box Sample Date 12/28/04			J025J8, Test Pit 25 Soil Under Pipe Sample Date 12/28/04		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Analysis (SVOA) (continued)												
Di-n-butylphthalate	23	J	350	340	U	340	36	J	350	350	U	350
Di-n-octylphthalate	350	U	350	340	U	340	350	U	350	350	U	350
Dibenz[a,h]anthracene	350	U	350	340	U	340	350	U	350	350	U	350
Dibenzofuran	350	U	350	340	U	340	350	U	350	350	U	350
Diethylphthalate	350	U	350	340	U	340	34	J	350	31	J	350
Dimethyl phthalate	350	U	350	340	U	340	350	U	350	350	U	350
Fluoranthene	350	U	350	340	U	340	350	U	350	350	U	350
Fluorene	350	U	350	340	U	340	350	U	350	350	U	350
Hexachlorobenzene	350	U	350	340	U	340	350	U	350	350	U	350
Hexachlorobutadiene	350	U	350	340	U	340	350	U	350	350	U	350
Hexachlorocyclopentadiene	350	U	350	340	U	340	350	U	350	350	U	350
Hexachloroethane	350	U	350	340	U	340	350	U	350	350	U	350
Indeno(1,2,3-cd)pyrene	350	U	350	340	U	340	350	U	350	350	U	350
Isophorone	350	U	350	340	U	340	350	U	350	350	U	350
N-Nitroso-di-n-dipropylamine	350	U	350	340	U	340	350	U	350	350	U	350
N-Nitrosodiphenylamine	350	U	350	340	U	340	350	U	350	350	U	350
Naphthalene	350	U	350	340	U	340	350	U	350	350	U	350
Nitrobenzene	350	U	350	340	U	340	350	U	350	350	U	350
Pentachlorophenol	880	U	880	860	U	860	870	U	870	880	U	880
Phenanthrene	350	U	350	340	U	340	350	U	350	350	U	350
Phenol	350	U	350	340	U	340	350	U	350	350	U	350
Pyrene	350	U	350	340	U	340	350	U	350	350	U	350

Table B-3. 100-F-26:9 Organic Data Results. (14 Pages)

Constituent	J025J9, Test Pit 26 Soil Under Pipe Sample Date 12/28/04			J025K0, Test Pit 26 Junction Box Contents Sample Date 12/28/04			J025K1, Test Pit 12 Junction Box Contents Sample Date 01/03/05			J025K2, Test Pit 12 Soil Under Junction Box Sample Date 01/03/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PCBs (Polychlorinated Biphenyls)												
Aroclor-1016	15	U	15	15	U	15	34	U	34	35	U	35
Aroclor-1221	15	U	15	15	U	15	34	U	34	35	U	35
Aroclor-1232	15	U	15	15	U	15	34	U	34	35	U	35
Aroclor-1242	15	U	15	15	U	15	34	U	34	35	U	35
Aroclor-1248	15	U	15	15	U	15	34	U	34	35	U	35
Aroclor-1254	15	U	15	46		15	34	U	34	35	U	35
Aroclor-1260	15	U	15	15	U	15	34	U	34	35	U	35
Semivolatle Organic Analysis (SVOA)												
1,2,4-Trichlorobenzene	370	U	370	390	U	390	340	U	340	350	U	350
1,2-Dichlorobenzene	370	U	370	390	U	390	340	U	340	350	U	350
1,3-Dichlorobenzene	370	U	370	390	U	390	340	U	340	350	U	350
1,4-Dichlorobenzene	370	U	370	390	U	390	340	U	340	350	U	350
2,4,5-Trichlorophenol	920	U	920	970	U	970	860	U	860	870	U	870
2,4,6-Trichlorophenol	370	U	370	390	U	390	340	U	340	350	U	350
2,4-Dichlorophenol	370	U	370	390	U	390	340	U	340	350	U	350
2,4-Dimethylphenol	370	U	370	390	U	390	340	U	340	350	U	350
2,4-Dinitrophenol	920	U	920	970	U	970	860	U	860	870	U	870
2,4-Dinitrotoluene	370	U	370	390	U	390	340	U	340	350	U	350
2,6-Dinitrotoluene	370	U	370	390	U	390	340	U	340	350	U	350
2-Chloronaphthalene	370	U	370	390	U	390	340	U	340	350	U	350
2-Chlorophenol	370	U	370	390	U	390	340	U	340	350	U	350
2-Methylnaphthalene	370	U	370	390	U	390	340	U	340	350	U	350
2-Methylphenol (cresol, o-)	370	U	370	390	U	390	340	U	340	350	U	350
2-Nitroaniline	920	U	920	970	U	970	860	U	860	870	U	870
2-Nitrophenol	370	U	370	390	U	390	340	U	340	350	U	350
3+4 Methylphenol (cresol, m+p)	370	U	370	390	U	390	340	U	340	350	U	350
3,3'-Dichlorobenzidine	370	U	370	390	U	390	340	U	340	350	U	350
3-Nitroaniline	920	U	920	970	U	970	860	U	860	870	U	870
4,6-Dinitro-2-methylphenol	920	U	920	970	U	970	860	U	860	870	U	870
4-Bromophenylphenyl ether	370	U	370	390	U	390	340	U	340	350	U	350
4-Chloro-3-methylphenol	370	U	370	390	U	390	340	U	340	350	U	350
4-Chloroaniline	370	U	370	390	U	390	340	U	340	350	U	350
4-Chlorophenylphenyl ether	370	U	370	390	U	390	340	U	340	350	U	350
4-Nitroaniline	920	U	920	970	U	970	860	U	860	870	U	870
4-Nitrophenol	920	U	920	970	U	970	860	U	860	870	U	870
Acenaphthene	370	U	370	390	U	390	79.941	J	340	350	U	350
Acenaphthylene	370	U	370	25	J	390	340	U	340	350	U	350
Anthracene	370	U	370	74	J	390	128.413	J	340	350	U	350
Benzo(a)anthracene	370	U	370	430		390	509.401		340	350	U	350
Benzo(a)pyrene	370	U	370	330	J	390	472.378		340	350	U	350
Benzo(b)fluoranthene	370	U	370	340	J	390	397.579		340	350	U	350
Benzo(ghi)perylene	370	U	370	240	J	390	98.932	J	340	350	U	350
Benzo(k)fluoranthene	370	U	370	330.234	J	390	574.875		340	350	U	350
Bis(2-chloro-1-methylethyl)ether	370	U	370	390	U	390	340	U	340	350	U	350
Bis(2-Chloroethoxy)methane	370	U	370	390	U	390	340	U	340	350	U	350
Bis(2-chloroethyl) ether	370	U	370	390	U	390	340	U	340	350	U	350
Bis(2-ethylhexyl) phthalate	690		370	160	J	390	33.989	J	340	51.137	J	350
Butylbenzylphthalate	41	J	370	20	J	390	340	U	340	350	U	350
Carbazole	370	U	370	36	J	390	103.114	J	340	350	U	350
Chrysene	370	U	370	430		390	667.655		340	350	U	350

Constituent	J025J9, Test Pit 26 Soil Under Pipe Sample Date 12/28/04			J025K0, Test Pit 26 Junction Box Contents Sample Date 12/28/04			J025K1, Test Pit 12 Junction Box Contents Sample Date 01/03/05			J025K2, Test Pit 12 Soil Under Junction Box Sample Date 01/03/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Analysis (SVOA) (continued)												
Di-n-butylphthalate	370	U	370	62	J	390	340	U	340	350	U	350
Di-n-octylphthalate	370	U	370	390	U	390	340	U	340	350	U	350
Dibenz[a,h]anthracene	370	U	370	110	J	390	47.084	J	340	350	U	350
Dibenzofuran	370	U	370	390	U	390	17.723	J	340	350	U	350
Diethylphthalate	30	J	370	390	U	390	340	U	340	350	U	350
Dimethyl phthalate	370	U	370	390	U	390	340	U	340	350	U	350
Fluoranthene	370	U	370	670		390	1351.883		340	350	U	350
Fluorene	370	U	370	390	U	390	50.546	J	340	350	U	350
Hexachlorobenzene	370	U	370	390	U	390	340	U	340	350	U	350
Hexachlorobutadiene	370	U	370	390	U	390	340	U	340	350	U	350
Hexachlorocyclopentadiene	370	U	370	390	U	390	340	U	340	350	U	350
Hexachloroethane	370	U	370	390	U	390	340	U	340	350	U	350
Indeno(1,2,3-cd)pyrene	370	U	370	230	J	390	117.58	J	340	350	U	350
Isophorone	370	U	370	390	U	390	340	U	340	350	U	350
N-Nitroso-di-n-dipropylamine	370	U	370	390	U	390	340	U	340	350	U	350
N-Nitrosodiphenylamine	370	U	370	390	U	390	340	U	340	350	U	350
Naphthalene	370	U	370	390	U	390	340	U	340	350	U	350
Nitrobenzene	370	U	370	390	U	390	340	U	340	350	U	350
Pentachlorophenol	920	U	920	970	U	970	860	U	860	870	U	870
Phenanthrene	370	U	370	247.637	J		719.263		340	350	U	350
Phenol	370	U	370	390	U	390	340	U	340	350	U	350
Pyrene	370	U	370	640		390	871.963		340	350	U	350

Table B-3. 100-F-26:9 Organic Data Results. (14 Pages)

Constituent	J025K3, Test Pit 12 Duplicate of J025K2 Sample Date 01/03/05			J025K4, Test Pit 19 Junction Box Contents Sample Date 01/03/05			J025K5, Test Pit 19 Soil Under Junction Box Sample Date 01/03/05			J026D1, Test Pit 28 Soil Under Junction Box Sample Date 01/03/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PCBs (Polychlorinated Biphenyls)												
Aroclor-1016	35	U	35	34	U	34	34	U	34	35	U	35
Aroclor-1221	35	U	35	34	U	34	34	U	34	35	U	35
Aroclor-1232	35	U	35	34	U	34	34	U	34	35	U	35
Aroclor-1242	35	U	35	34	U	34	34	U	34	35	U	35
Aroclor-1248	35	U	35	34	U	34	34	U	34	35	U	35
Aroclor-1254	35	U	35	34	U	34	14		34	35	U	35
Aroclor-1260	35	U	35	34	U	34	34	U	34	35	U	35
Semivolatle Organic Analysis (SVOA)												
1,2,4-Trichlorobenzene	350	U	350	340	U	340	340	U	340	350	U	350
1,2-Dichlorobenzene	350	U	350	340	U	340	340	U	340	350	U	350
1,3-Dichlorobenzene	350	U	350	340	U	340	340	U	340	350	U	350
1,4-Dichlorobenzene	350	U	350	340	U	340	340	U	340	350	U	350
2,4,5-Trichlorophenol	870	U	870	860	U	860	860	U	860	870	U	870
2,4,6-Trichlorophenol	350	U	350	340	U	340	340	U	340	350	U	350
2,4-Dichlorophenol	350	U	350	340	U	340	340	U	340	350	U	350
2,4-Dimethylphenol	350	U	350	340	U	340	340	U	340	350	U	350
2,4-Dinitrophenol	870	U	870	860	U	860	860	U	860	870	U	870
2,4-Dinitrotoluene	350	U	350	340	U	340	340	U	340	350	U	350
2,6-Dinitrotoluene	350	U	350	340	U	340	340	U	340	350	U	350
2-Chloronaphthalene	350	U	350	340	U	340	340	U	340	350	U	350
2-Chlorophenol	350	U	350	340	U	340	340	U	340	350	U	350
2-Methylnaphthalene	350	U	350	340	U	340	340	U	340	350	U	350
2-Methylphenol (cresol, o-)	350	U	350	340	U	340	340	U	340	350	U	350
2-Nitroaniline	870	U	870	860	U	860	860	U	860	870	U	870
2-Nitrophenol	350	U	350	340	U	340	340	U	340	350	U	350
3+4 Methylphenol (cresol, m+p)	350	U	350	340	U	340	340	U	340	350	U	350
3,3'-Dichlorobenzidine	350	U	350	340	U	340	340	U	340	350	U	350
3-Nitroaniline	870	U	870	860	U	860	860	U	860	870	U	870
4,6-Dinitro-2-methylphenol	870	U	870	860	U	860	860	U	860	870	U	870
4-Bromophenylphenyl ether	350	U	350	340	U	340	340	U	340	350	U	350
4-Chloro-3-methylphenol	350	U	350	340	U	340	340	U	340	350	U	350
4-Chloroaniline	350	U	350	340	U	340	340	U	340	350	U	350
4-Chlorophenylphenyl ether	350	U	350	340	U	340	340	U	340	350	U	350
4-Nitroaniline	870	U	870	860	U	860	860	U	860	870	U	870
4-Nitrophenol	870	U	870	860	U	860	860	U	860	870	U	870
Acenaphthene	350	U	350	340	U	340	340	U	340	350	U	350
Acenaphthylene	350	U	350	340	U	340	340	U	340	350	U	350
Anthracene	350	U	350	340	U	340	340	U	340	350	U	350
Benzo(a)anthracene	350	U	350	340	U	340	19.242	J	340	350	U	350
Benzo(a)pyrene	350	U	350	340	U	340	21.266	J	340	350	U	350
Benzo(b)fluoranthene	350	U	350	340	U	340	340	U	340	350	U	350
Benzo(ghi)perylene	350	U	350	340	U	340	340	U	340	350	U	350
Benzo(k)fluoranthene	350	U	350	340	U	340	22.141	J	340	350	U	350
Bis(2-chloro-1-methylethyl)ether	350	U	350	340	U	340	340	U	340	350	U	350
Bis(2-Chloroethoxy)methane	350	U	350	340	U	340	340	U	340	350	U	350
Bis(2-chloroethyl) ether	350	U	350	340	U	340	340	U	340	350	U	350
Bis(2-ethylhexyl) phthalate	47.204	J	350	18.427	J	340	21.935	J	340	18.319	J	350
Butylbenzylphthalate	350	U	350	340	U	340	340	U	340	350	U	350
Carbazole	350	U	350	340	U	340	340	U	340	350	U	350
Chrysene	350	U	350	340	U	340	29.395	J	340	350	U	350

Table B-3. 100-F-26:9 Organic Data Results. (14 Pages)

Constituent	J025K3, Test Pit 12 Duplicate of J025K2 Sample Date 01/03/05			J025K4, Test Pit 19 Junction Box Contents Sample Date 01/03/05			J025K5, Test Pit 19 Soil Under Junction Box Sample Date 01/03/05			J026D1, Test Pit 28 Soil Under Junction Box Sample Date 01/03/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Analysis (SVOA) (continued)												
Di-n-butylphthalate	350	U	350	340	U	340	17.579	J	340	350	U	350
Di-n-octylphthalate	350	U	350	340	U	340	340	U	340	350	U	350
Dibenz[a,h]anthracene	350	U	350	340	U	340	340	U	340	350	U	350
Dibenzofuran	350	U	350	340	U	340	340	U	340	350	U	350
Diethylphthalate	350	U	350	340	U	340	340	U	340	350	U	350
Dimethyl phthalate	350	U	350	340	U	340	340	U	340	350	U	350
Fluoranthene	350	U	350	340	U	340	37.095	J	340	350	U	350
Fluorene	350	U	350	340	U	340	340	U	340	350	U	350
Hexachlorobenzene	350	U	350	340	U	340	340	U	340	350	U	350
Hexachlorobutadiene	350	U	350	340	U	340	340	U	340	350	U	350
Hexachlorocyclopentadiene	350	U	350	340	U	340	340	U	340	350	U	350
Hexachloroethane	350	U	350	340	U	340	340	U	340	350	U	350
Indeno(1,2,3-cd)pyrene	350	U	350	340	U	340	340	U	340	350	U	350
Isophorone	350	U	350	340	U	340	340	U	340	350	U	350
N-Nitroso-di-n-dipropylamine	350	U	350	340	U	340	340	U	340	350	U	350
N-Nitrosodiphenylamine	350	U	350	340	U	340	340	U	340	350	U	350
Naphthalene	350	U	350	340	U	340	340	U	340	350	U	350
Nitrobenzene	350	U	350	340	U	340	340	U	340	350	U	350
Pentachlorophenol	870	U	870	860	U	860	860	U	860	870	U	870
Phenanthrene	350	U	350	340	U	340	28.589	J	340	350	U	350
Phenol	350	U	350	340	U	340	340	U	340	350	U	350
Pyrene	350	U	350	340	U	340	46.665	J	340	350	U	350

Table B-3. 100-F-26:9 Organic Data Results. (14 Pages)

Constituent	J026D2, Test Pit 28 Junction Box Contents Sample Date 01/03/05			J026D4, Test Pit 27 Soil Under Junction Box Sample Date 01/06/05			J02D75, Test Pit 8 Soil Under Junction Box Sample Date 01/13/05			J02D76, Test Pit 22 Soil Under Junction Box Sample Date 01/13/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PCBs (Polychlorinated Biphenyls)												
Aroclor-1016	36	U	36	36	U	36	36	U	36	34	U	34
Aroclor-1221	36	U	36	36	U	36	36	U	36	34	U	34
Aroclor-1232	36	U	36	36	U	36	36	U	36	34	U	34
Aroclor-1242	36	U	36	36	U	36	36	U	36	34	U	34
Aroclor-1248	36	U	36	36	U	36	36	U	36	34	U	34
Aroclor-1254	180		36	36	U	36	36	U	36	34	U	34
Aroclor-1260	36	U	36	36	U	36	36	U	36	34	U	34
Semivolatle Organic Analysis (SVOA)												
1,2,4-Trichlorobenzene	360	U	360	360	U	360	360	U	360	340	U	340
1,2-Dichlorobenzene	360	U	360	360	U	360	360	U	360	340	U	340
1,3-Dichlorobenzene	360	U	360	360	U	360	360	U	360	340	U	340
1,4-Dichlorobenzene	360	U	360	360	U	360	360	U	360	340	U	340
2,4,5-Trichlorophenol	890	U	890	890	U	890	890	U	890	860	U	860
2,4,6-Trichlorophenol	360	U	360	360	U	360	360	U	360	340	U	340
2,4-Dichlorophenol	360	U	360	360	U	360	360	U	360	340	U	340
2,4-Dimethylphenol	360	U	360	360	U	360	360	U	360	340	U	340
2,4-Dinitrophenol	890	U	890	890	U	890	890	U	890	860	U	860
2,4-Dinitrotoluene	360	U	360	360	U	360	360	U	360	340	U	340
2,6-Dinitrotoluene	360	U	360	360	U	360	360	U	360	340	U	340
2-Chloronaphthalene	360	U	360	360	U	360	360	U	360	340	U	340
2-Chlorophenol	360	U	360	360	U	360	360	U	360	340	U	340
2-Methylnaphthalene	360	U	360	360	U	360	360	U	360	340	U	340
2-Methylphenol (cresol, o-)	360	U	360	360	U	360	360	U	360	340	U	340
2-Nitroaniline	890	U	890	890	U	890	890	U	890	860	U	860
2-Nitrophenol	360	U	360	360	U	360	360	U	360	340	U	340
3+4 Methylphenol (cresol, m+p)	360	U	360	360	U	360	360	U	360	340	U	340
3,3'-Dichlorobenzidine	360	U	360	360	U	360	360	U	360	340	U	340
3-Nitroaniline	890	U	890	890	U	890	890	U	890	860	U	860
4,6-Dinitro-2-methylphenol	890	U	890	890	U	890	890	U	890	860	U	860
4-Bromophenylphenyl ether	360	U	360	360	U	360	360	U	360	340	U	340
4-Chloro-3-methylphenol	360	U	360	360	U	360	360	U	360	340	U	340
4-Chloroaniline	360	U	360	360	U	360	360	U	360	340	U	340
4-Chlorophenylphenyl ether	360	U	360	360	U	360	360	U	360	340	U	340
4-Nitroaniline	890	U	890	890	U	890	890	U	890	860	U	860
4-Nitrophenol	890	U	890	890	U	890	890	U	890	860	U	860
Acenaphthene	360	U	360	360	U	360	360	U	360	340	U	340
Acenaphthylene	21.508	J	360	360	U	360	360	U	360	340	U	340
Anthracene	19.32	J	360	360	U	360	360	U	360	340	U	340
Benzo(a)anthracene	40.792	J	360	360	U	360	360	U	360	340	U	340
Benzo(a)pyrene	39.494	J	360	360	U	360	360	U	360	340	U	340
Benzo(b)fluoranthene	64.756	J	360	360	U	360	360	U	360	340	U	340
Benzo(ghi)perylene	360	U	360	360	U	360	360	U	360	340	U	340
Benzo(k)fluoranthene	62.14	J	360	360	U	360	360	U	360	340	U	340
Bis(2-chloro-1-methylethyl)ether	360	U	360	360	U	360	360	U	360	340	U	340
Bis(2-Chloroethoxy)methane	360	U	360	360	U	360	360	U	360	340	U	340
Bis(2-chloroethyl) ether	360	U	360	360	U	360	360	U	360	340	U	340
Bis(2-ethylhexyl) phthalate	456.42		360	26.647	J	360	86.633	JB	360	54.84	JB	340
Butylbenzylphthalate	360	U	360	360	U	360	27.43	J	360	340	U	340
Carbazole	360	U	360	360	U	360	360	U	360	340	U	340
Chrysene	75.643	J	360	360	U	360	360	U	360	340	U	340

Table B-3. 100-F-26:9 Organic Data Results. (14 Pages)

Constituent	J026D2, Test Pit 28 Junction Box Contents Sample Date 01/03/05			J026D4, Test Pit 27 Soil Under Junction Box Sample Date 01/06/05			J02D75, Test Pit 8 Soil Under Junction Box Sample Date 01/13/05			J02D76, Test Pit 22 Soil Under Junction Box Sample Date 01/13/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Analysis (SVOA) (continued)												
Di-n-butylphthalate	360	U	360	360	U	360	135.743	J	360	340	U	340
Di-n-octylphthalate	360	U	360	360	U	360	360	U	360	340	U	340
Dibenz[a,h]anthracene	360	U	360	360	U	360	360	U	360	340	U	340
Dibenzofuran	360	U	360	360	U	360	360	U	360	340	U	340
Diethylphthalate	360	U	360	360	U	360	360	U	360	340	U	340
Dimethyl phthalate	360	U	360	360	U	360	360	U	360	340	U	340
Fluoranthene	122.395	J	360	360	U	360	360	U	360	340	U	340
Fluorene	360	U	360	360	U	360	360	U	360	340	U	340
Hexachlorobenzene	360	U	360	360	U	360	360	U	360	340	U	340
Hexachlorobutadiene	360	U	360	360	U	360	360	U	360	340	U	340
Hexachlorocyclopentadiene	360	U	360	360	U	360	360	U	360	340	U	340
Hexachloroethane	360	U	360	360	U	360	360	U	360	340	U	340
Indeno(1,2,3-cd)pyrene	360	U	360	360	U	360	360	U	360	340	U	340
Isophorone	360	U	360	360	U	360	360	U	360	340	U	340
N-Nitroso-di-n-dipropylamine	360	U	360	360	U	360	360	U	360	340	U	340
N-Nitrosodiphenylamine	360	U	360	360	U	360	360	U	360	340	U	340
Naphthalene	360	U	360	360	U	360	360	U	360	340	U	340
Nitrobenzene	360	U	360	360	U	360	360	U	360	340	U	340
Pentachlorophenol	890	U	890	890	U	890	890	U	890	860	U	860
Phenanthrene	39.974	J	360	360	U	360	360	U	360	340	U	340
Phenol	65.663	J	360	360	U	360	360	U	360	340	U	340
Pyrene	76.817	J	360	360	U	360	360	U	360	340	U	340

Table B-3. 100-F-26:9 Organic Data Results. (14 Pages)

Constituent	J025K6, Test Pit 27 Junction Box Contents Sample Date 01/06/05			J025K8, Test Pit 24 Pipe Contents Sample Date 01/10/05			J025K9, Test Pit 8 Junction Box/ Elbow Contents Sample Date 01/13/05			J025L0, Test Pit 22 Junction Box Contents Sample Date 01/13/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PCBs (Polychlorinated Biphenyls)												
Aroclor-1016	45	U	45	340	U	340	35	U	35	35	U	35
Aroclor-1221	45	U	45	340	U	340	35	U	35	35	U	35
Aroclor-1232	45	U	45	340	U	340	35	U	35	35	U	35
Aroclor-1242	45	U	45	340	U	340	35	U	35	35	U	35
Aroclor-1248	45	U	45	340	U	340	35	U	35	35	U	35
Aroclor-1254	810		45	550		340	35	U	35	35	U	35
Aroclor-1260	45	U	45	340	U	340	13		35	35	U	35
Semivolatle Organic Analysis (SVOA)												
1,2,4-Trichlorobenzene	1800	U	1800	340	U	340	350	U	350	350	U	350
1,2-Dichlorobenzene	1800	U	1800	340	U	340	350	U	350	350	U	350
1,3-Dichlorobenzene	1800	U	1800	340	U	340	350	U	350	350	U	350
1,4-Dichlorobenzene	1800	U	1800	340	U	340	350	U	350	350	U	350
2,4,5-Trichlorophenol	4500	U	4500	850	U	850	880	U	880	870	U	870
2,4,6-Trichlorophenol	1800	U	1800	340	U	340	350	U	350	350	U	350
2,4-Dichlorophenol	1800	U	1800	340	U	340	350	U	350	350	U	350
2,4-Dimethylphenol	1800	U	1800	340	U	340	350	U	350	350	U	350
2,4-Dinitrophenol	4500	U	4500	850	U	850	880	U	880	870	U	870
2,4-Dinitrotoluene	1800	U	1800	340	U	340	350	U	350	350	U	350
2,6-Dinitrotoluene	1800	U	1800	340	U	340	350	U	350	350	U	350
2-Chloronaphthalene	1800	U	1800	340	U	340	350	U	350	350	U	350
2-Chlorophenol	1800	U	1800	340	U	340	350	U	350	350	U	350
2-Methylnaphthalene	1800	U	1800	340	U	340	350	U	350	350	U	350
2-Methylphenol (cresol, o-)	1800	U	1800	340	U	340	350	U	350	350	U	350
2-Nitroaniline	4500	U	4500	850	U	850	880	U	880	870	U	870
2-Nitrophenol	1800	U	1800	340	U	340	350	U	350	350	U	350
3+4 Methylphenol (cresol, m+p)	1800	U	1800	340	U	340	350	U	350	350	U	350
3,3'-Dichlorobenzidine	1800	U	1800	340	U	340	350	U	350	350	U	350
3-Nitroaniline	4500	U	4500	850	U	850	880	U	880	870	U	870
4,6-Dinitro-2-methylphenol	4500	U	4500	850	U	850	880	U	880	870	U	870
4-Bromophenylphenyl ether	1800	U	1800	340	U	340	350	U	350	350	U	350
4-Chloro-3-methylphenol	1800	U	1800	340	U	340	350	U	350	350	U	350
4-Chloroaniline	1800	U	1800	340	U	340	350	U	350	350	U	350
4-Chlorophenylphenyl ether	1800	U	1800	340	U	340	350	U	350	350	U	350
4-Nitroaniline	4500	U	4500	850	U	850	880	U	880	870	U	870
4-Nitrophenol	4500	U	4500	850	U	850	880	U	880	870	U	870
Acenaphthene	1800	U	1800	340	U	340	350	U	350	350	U	350
Acenaphthylene	1800	U	1800	340	U	340	350	U	350	350	U	350
Anthracene	1800	U	1800	340	U	340	69	J	350	350	U	350
Benzo(a)anthracene	1800	U	1800	340	U	340	360		350	29	J	350
Benzo(a)pyrene	1800	U	1800	340	U	340	290	J	350	24	J	350
Benzo(b)fluoranthene	1800	U	1800	340	U	340	280	J	350	33	J	350
Benzo(ghi)perylene	1800	U	1800	340	U	340	180	J	350	23	J	350
Benzo(k)fluoranthene	1800	U	1800	340	U	340	290	J	350	21	J	350
Bis(2-chloro-1-methylethyl)ether	1800	U	1800	340	U	340	350	U	350	350	U	350
Bis(2-Chloroethoxy)methane	1800	U	1800	340	U	340	350	U	350	350	U	350
Bis(2-chloroethyl) ether	1800	U	1800	340	U	340	350	U	350	350	U	350
Bis(2-ethylhexyl) phthalate	250.046	J	1800	330	JB	340	140	JB	350	67	JB	350
Butylbenzylphthalate	1800	U	1800	340	U	340	71	J	350	350	U	350
Carbazole	1800	U	1800	340	U	340	65	J	350	350	U	350
Chrysene	1800	U	1800	340	U	340	370		350	37	J	350

Table B-3. 100-F-26:9 Organic Data Results. (14 Pages)

Constituent	J025K6, Test Pit 27 Junction Box Contents Sample Date 01/06/05			J025K8, Test Pit 24 Pipe Contents Sample Date 01/10/05			J025K9, Test Pit 8 Junction Box/ Elbow Contents Sample Date 01/13/05			J025L0, Test Pit 22 Junction Box Contents Sample Date 01/13/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Analysis (SVOA) (continued)												
Di-n-butylphthalate	114.496	J	1800	230	J	340	500		350	45	J	350
Di-n-octylphthalate	1800	U	1800	340	U	340	350	U	350	350	U	350
Dibenz[a,h]anthracene	1800	U	1800	340	U	340	79	J	350	350	U	350
Dibenzofuran	1800	U	1800	340	U	340	350	U	350	350	U	350
Diethylphthalate	1800	U	1800	340	U	340	350	U	350	350	U	350
Dimethyl phthalate	1800	U	1800	340	U	340	350	U	350	350	U	350
Fluoranthene	1800	U	1800	340	U	340	620		350	46	J	350
Fluorene	1800	U	1800	340	U	340	350	U	350	350	U	350
Hexachlorobenzene	1800	U	1800	340	U	340	350	U	350	350	U	350
Hexachlorobutadiene	1800	U	1800	340	U	340	350	U	350	350	U	350
Hexachlorocyclopentadiene	1800	U	1800	340	U	340	350	U	350	350	U	350
Hexachloroethane	1800	U	1800	340	U	340	350	U	350	350	U	350
Indeno(1,2,3-cd)pyrene	1800	U	1800	340	U	340	180	J	350	18	J	350
Isophorone	1800	U	1800	340	U	340	350	U	350	350	U	350
N-Nitroso-di-n-dipropylamine	1800	U	1800	340	U	340	350	U	350	350	U	350
N-Nitrosodiphenylamine	1800	U	1800	340	U	340	350	U	350	350	U	350
Naphthalene	1800	U	1800	340	U	340	350	U	350	350	U	350
Nitrobenzene	1800	U	1800	340	U	340	350	U	350	350	U	350
Pentachlorophenol	334.798	J	4500	850	U	850	880	U	880	870	U	870
Phenanthrene	1800	U	1800	340	U	340	220	J	350	350	U	350
Phenol	1800	U	1800	340	U	340	350	U	350	350	U	350
Pyrene	1800	U	1800	340	U	340	470		350	32	J	350

Table B-3. 100-F-26:9 Organic Data Results. (14 Pages)

Constituent	J025P9, Test Pit 25 Pipe Contents Sample Date 12/28/04											
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
PCBs (Polychlorinated Biphenyls)												
Aroclor-1016	36	U	36									
Aroclor-1221	36	U	36									
Aroclor-1232	36	U	36									
Aroclor-1242	36	U	36									
Aroclor-1248	36	U	36									
Aroclor-1254	36	U	36									
Aroclor-1260	36	U	36									
Semivolatle Organic Analysis (SVOA)												
1,2,4-Trichlorobenzene	360	U	360									
1,2-Dichlorobenzene	360	U	360									
1,3-Dichlorobenzene	360	U	360									
1,4-Dichlorobenzene	360	U	360									
2,4,5-Trichlorophenol	890	U	890									
2,4,6-Trichlorophenol	360	U	360									
2,4-Dichlorophenol	360	U	360									
2,4-Dimethylphenol	360	U	360									
2,4-Dinitrophenol	890	U	890									
2,4-Dinitrotoluene	360	U	360									
2,6-Dinitrotoluene	360	U	360									
2-Chloronaphthalene	360	U	360									
2-Chlorophenol	360	U	360									
2-Methylnaphthalene	360	U	360									
2-Methylphenol (cresol, o-)	360	U	360									
2-Nitroaniline	890	U	890									
2-Nitrophenol	360	U	360									
3+4 Methylphenol (cresol, m+p)	360	U	360									
3,3'-Dichlorobenzidine	360	U	360									
3-Nitroaniline	890	U	890									
4,6-Dinitro-2-methylphenol	890	U	890									
4-Bromophenylphenyl ether	360	U	360									
4-Chloro-3-methylphenol	360	U	360									
4-Chloroaniline	360	U	360									
4-Chlorophenylphenyl ether	360	U	360									
4-Nitroaniline	890	U	890									
4-Nitrophenol	890	U	890									
Acenaphthene	360	U	360									
Acenaphthylene	360	U	360									
Anthracene	360	U	360									
Benzo(a)anthracene	360	U	360									
Benzo(a)pyrene	360	U	360									
Benzo(b)fluoranthene	360	U	360									
Benzo(ghi)perylene	360	U	360									
Benzo(k)fluoranthene	360	U	360									
Bis(2-chloro-1-methylethyl)ether	360	U	360									
Bis(2-Chloroethoxy)methane	360	U	360									
Bis(2-chloroethyl) ether	360	U	360									
Bis(2-ethylhexyl) phthalate	110	J	360									
Butylbenzylphthalate	39	J	360									
Carbazole	360	U	360									
Chrysene	360	U	360									

Table B-3. 100-F-26:9 Organic Data Results. (14 Pages)

Constituent	J025P9, Test Pit 25 Pipe Contents Sample Date 12/28/04											
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Analysis (SVOA) (continued)												
Di-n-butylphthalate	360	U	360									
Di-n-octylphthalate	360	U	360									
Dibenz[a,h]anthracene	360	U	360									
Dibenzofuran	360	U	360									
Diethylphthalate	30	J	360									
Dimethyl phthalate	360	U	360									
Fluoranthene	360	U	360									
Fluorene	360	U	360									
Hexachlorobenzene	360	U	360									
Hexachlorobutadiene	360	U	360									
Hexachlorocyclopentadiene	360	U	360									
Hexachloroethane	360	U	360									
Indeno(1,2,3-cd)pyrene	360	U	360									
Isophorone	360	U	360									
N-Nitroso-di-n-dipropylamine	360	U	360									
N-Nitrosodiphenylamine	360	U	360									
Naphthalene	360	U	360									
Nitrobenzene	360	U	360									
Pentachlorophenol	890	U	890									
Phenanthrene	360	U	360									
Phenol	360	U	360									
Pyrene	360	U	360									

Table B-4. 100-F-26:9 Radionuclide Verification Data Results. (3 Pages)

Sample Location	HEIS Number	Sample Date	Americium-241 (GEA)			Barium-133			Cesium-137			Cobalt-60			Europium-152			Europium-154			Europium-155		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
RC-1	J14JT0	2/14/07	0.082	U	0.082				0.094	U	0.094	0.100	U	0.100	0.230	U	0.230	0.350	U	0.350	0.140	U	0.140
RB-1	J14JT1	2/14/07	0.270	U	0.270				0.082	U	0.082	0.093	U	0.093	0.190	U	0.190	0.300	U	0.300	0.200	U	0.200
RB-2	J14JT2	2/14/07	0.098	U	0.098				0.100	U	0.100	0.12	U	0.12	0.260	U	0.260	0.400	U	0.400	0.170	U	0.170
RC-2	J14JT3	2/14/07	0.260	U	0.260				0.071	U	0.071	0.078	U	0.078	0.180	U	0.180	0.240	U	0.240	0.160	U	0.160
RC-3	J14JT4	2/20/07	0.280	U	0.280				0.289		0.10	0.077	U	0.077	0.190	U	0.190	0.270	U	0.270	0.170	U	0.170
RC-4	J13W57	2/21/07	0.110	U	0.110				0.110	U	0.110	0.130	U	0.130	0.280	U	0.280	0.420	U	0.420	0.170	U	0.170
RB-3	J14JT5	2/21/07	0.250	U	0.250				0.078	U	0.078	0.089	U	0.089	0.190	U	0.190	0.310	U	0.310	0.190	U	0.190
Inprocess	J15W94	10/23/07	0.044	U	0.044	0.038	U	0.038	0.034	U	0.034	0.037	U	0.037	0.085	U	0.085	0.123	U	0.123	0.072	U	0.072
Inprocess	J15W95	10/23/07	0.095	U	0.095	0.014	U	0.014	0.011	U	0.011	0.012	U	0.012	0.029	U	0.029	0.042	U	0.042	0.050	U	0.050
OB-1	J16947	2/6/08	0.106	U	0.106	0.029	U	0.029	0.030	U	0.030	0.031	U	0.031	0.072	U	0.072	0.111	U	0.111	0.085	U	0.085
OB-2	J16948	2/6/08	0.070	U	0.070	0.076	U	0.076	0.066	U	0.066	0.073	U	0.073	0.179	U	0.179	0.214	U	0.214	0.154	U	0.154
OB-3	J16949	2/6/08	0.144	U	0.144	0.025	U	0.025	0.024	U	0.024	0.023	U	0.023	0.063	U	0.063	0.076	U	0.076	0.074	U	0.074
OB-4	J16950	2/6/08	0.045	U	0.045	0.037	U	0.037	0.034	U	0.034	0.037	U	0.037	0.096	U	0.096	0.126	U	0.126	0.074	U	0.074
OB-5	J16951	2/11/08	0.112	U	0.112	0.032	U	0.032	0.038	U	0.038	0.035	U	0.035	0.079	U	0.079	0.122	U	0.122	0.090	U	0.090
OB-6	J16952	2/11/08	0.196	U	0.196	0.039	U	0.039	0.030	U	0.030	0.030	U	0.030	0.077	U	0.077	0.093	U	0.093	0.105	U	0.105
OB-7	J16953	2/11/08	0.048	U	0.048	0.049	U	0.049	0.040	U	0.040	0.041	U	0.041	0.114	U	0.114	0.136	U	0.136	0.091	U	0.091
OB-8	J16954	2/11/08	0.116	U	0.116	0.025	U	0.025	0.024	U	0.024	0.024	U	0.024	0.069	U	0.069	0.078	U	0.078	0.090	U	0.090
OB-9	J16955	2/11/08	0.314	U	0.314	0.040	U	0.040	0.038	U	0.038	0.042	U	0.042	0.105	U	0.105	0.137	U	0.137	0.121	U	0.121
OB-10	J16956	2/11/08	0.114	U	0.114	0.032	U	0.032	0.074		0.038	0.035	U	0.035	0.077	U	0.077	0.107	U	0.107	0.091	U	0.091
OB-11	J16957	2/11/08	0.154	U	0.154	0.032	U	0.032	0.036	U	0.036	0.024	U	0.024	0.065	U	0.065	0.078	U	0.078	0.109	U	0.109
OB-12	J16958	2/11/08	0.036	U	0.036	0.028	U	0.028	0.028	U	0.028	0.028	U	0.028	0.070	U	0.070	0.104	U	0.104	0.085	U	0.085
OB-13	J16959	2/11/08	0.262	U	0.262	0.038	U	0.038	0.032	U	0.032	0.035	U	0.035	0.083	U	0.083	0.130	U	0.130	0.154	U	0.154
OB-14	J16960	2/11/08	0.095	U	0.095	0.022	U	0.022	0.033		0.022	0.020	U	0.020	0.058	U	0.058	0.061	U	0.061	0.073	U	0.073
SP-1	J16961	2/12/08	0.036	U	0.036	0.036	U	0.036	0.031	U	0.031	0.031	U	0.031	0.079	U	0.079	0.101	U	0.101	0.071	U	0.071
SP-2	J16962	2/12/08	0.040	U	0.040	0.046	U	0.046	0.069	U	0.069	0.043	U	0.043	0.112	U	0.112	0.143	U	0.143	0.088	U	0.088
SP-3	J16963	2/12/08	0.031	U	0.031	0.026	U	0.026	0.022	U	0.022	0.026	U	0.026	0.062	U	0.062	0.089	U	0.089	0.057	U	0.057
SP-4	J16964	2/12/08	0.149	U	0.149	0.044	U	0.044	0.075	U	0.075	0.033	U	0.033	0.093	U	0.093	0.100	U	0.100	0.104	U	0.104
SP-5	J16965	2/12/08	0.355	U	0.355	0.093	U	0.093	0.074	U	0.074	0.088	U	0.088	0.225	U	0.225	0.270	U	0.270	0.214	U	0.214
SP-6	J16966	2/12/08	0.212	U	0.212	0.096	U	0.096	0.098	U	0.098	0.087	U	0.087	0.262	U	0.262	0.306	U	0.306	0.216	U	0.216
SP-7	J16967	2/12/08	0.183	U	0.183	0.067	U	0.067	0.051	U	0.051	0.060	U	0.060	0.157	U	0.157	0.193	U	0.193	0.175	U	0.175
SP-8	J16968	2/12/08	0.134	U	0.134	0.034	U	0.034	0.031	U	0.031	0.034	U	0.034	0.077	U	0.077	0.114	U	0.114	0.076	U	0.076
SP-9	J16969	2/12/08	0.073	U	0.073	0.033	U	0.033	0.033	U	0.033	0.032	U	0.032	0.084	U	0.084	0.103	U	0.103	0.075	U	0.075
SP-10	J16970	2/12/08	0.063	U	0.063	0.023	U	0.023	0.020	U	0.020	0.021	U	0.021	0.060	U	0.060	0.061	U	0.061	0.063	U	0.063
Dup. of SP-10	J16971	2/12/08	0.154	U	0.154	0.071	U	0.071	0.069	U	0.069	0.067	U	0.067	0.176	U	0.176	0.220	U	0.220	0.153	U	0.153
FS-3	J169W9	2/13/08	0.079	U	0.079	0.078	U	0.078	0.072	U	0.072	0.065	U	0.065	0.170	U	0.170	0.230	U	0.230	0.158	U	0.158
FS-4	J169X0	2/13/08	0.161	U	0.161	0.061	U	0.061	0.057	U	0.057	0.060	U	0.060	0.148	U	0.148	0.193	U	0.193	0.168	U	0.168
FS-5	J169X1	2/13/08	0.190	U	0.190	0.091	U	0.091	0.085	U	0.085	0.090	U	0.090	0.221	U	0.221	0.281	U	0.281	0.192	U	0.192
FS-1	J16945	2/13/08	0.105	U	0.105	0.123	U	0.123	0.123	U	0.123	0.115	U	0.115	0.319	U	0.319	0.354	U	0.354	0.232	U	0.232
FS-2	J16946	2/13/08	0.092	U	0.092	0.063	U	0.063	0.064	U	0.064	0.068	U	0.068	0.162	U	0.162	0.213	U	0.213	0.154	U	0.154
SZ-1	J16934	2/14/08	0.340	U	0.340	0.088	U	0.088	0.084	U	0.084	0.077	U	0.077	0.205	U	0.205	0.330	U	0.330	0.174	U	0.174
SZ-2	J16935	2/14/08	0.140	U	0.140	0.055	U	0.055	0.054	U	0.054	0.050	U	0.050	0.140	U	0.140	0.171	U	0.171	0.145	U	0.145
SZ-3	J16936	2/14/08	0.082	U	0.082	0.080	U	0.080	0.076	U	0.076	0.071	U	0.071	0.170	U	0.170	0.244	U	0.244	0.155	U	0.155
SZ-4	J16937	2/14/08	0.087	U	0.087	0.061	U	0.061	0.065	U	0.065	0.062	U	0.062	0.156	U	0.156	0.164	U	0.164	0.144	U	0.144
SZ-5	J16938	2/14/08	0.091	U	0.091	0.060	U	0.060	0.071	U	0.071	0.063	U	0.063	0.157	U	0.157	0.235	U	0.235	0.151	U	0.151
SZ-6	J16939	2/14/08	0.085	U	0.085	0.090	U	0.090	0.066	U	0.066	0.068	U	0.068	0.194	U	0.194	0.267	U	0.267	0.161	U	0.161
SZ-7	J16940	2/14/08	0.326	U	0.326	0.080	U	0.080	0.073	U	0.073	0.087	U	0.087	0.181	U	0.181	0.251	U	0.251	0.183	U	0.183
SZ-8	J16941	2/14/08	0.168	U	0.168	0.062	U	0.062	0.057	U	0.057	0.053	U	0.053	0.157	U	0.157	0.202	U	0.202	0.166	U	0.166
SZ-9	J16942	2/14/08	0.060	U	0.060	0.066	U	0.066	0.052	U	0.052	0.054	U	0.054	0.137	U	0.137	0.180	U	0.180	0.123	U	0.123
SZ-10	J16943	2/14/08	0.116	U	0.116	0.042	U	0.042	0.035	U	0.035	0.031	U	0.031	0.110	U	0.110	0.121	U	0.121	0.116	U	0.116
Dup. of SZ-10	J16944	2/14/08	0.112	U	0.112	0.058	U	0.058	0.052	U	0.052	0.059	U	0.059	0.140	U	0.140	0.188	U	0.188	0.116	U	0.116
OB-1	J16M53	4/10/08	0.029	U	0.029	0.031	U	0.031	0.045	U	0.045	0.024	U	0.024	0.065	U	0.065	0.078	U	0.078	0.065	U	0.065

Note: The following abbreviations apply to all Attachment 1 tables. Data qualified with C and/or J are considered acceptable values.

C = method blank contamination (inorganic constituents)

GEA = gamma energy analysis

J = estimated

MDA = minimum detectable activity

PQL = practical quantitation limit

Q = qualifier

U = undetected

Table B-4. 100-F-26:9 Radionuclide Verification Data Results. (3 Pages)

Sample Location	HEIS Number	Sample Date	Potassium-40			Radium-226			Radium-228			Silver-108			Thorium-228			Thorium-232			Uranium-235		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
RC-1	J14JT0	2/14/07	12.2		1.1	0.254		0.16	0.600	U	0.600	0.071	U	0.071	0.630		0.140	0.600	U	0.600	0.240	U	0.240
RB-1	J14JT1	2/14/07	11.7		0.970	0.432		0.12	0.714		0.33	0.058	U	0.058	0.598		0.110	0.714		0.33	0.310	U	0.310
RB-2	J14JT2	2/14/07	11.6		1.3	0.428		0.19	0.722		0.55	0.082	U	0.082	0.727		0.170	0.722		0.55	0.280	U	0.280
RC-2	J14JT3	2/14/07	11.2		0.091	0.328		0.15	0.515		0.31	0.054	U	0.054	0.517		0.081	0.515		0.31	0.250	U	0.250
RC-3	J14JT4	2/20/07	11.8		0.620	0.274		0.14	0.738		0.27	0.063	U	0.063	0.459		0.085	0.738		0.27	0.270	U	0.270
RC-4	J13W57	2/21/07	12.5		1.3	0.494		0.22	0.565	U	0.58	0.084	U	0.084	0.762		0.190	0.565	U	0.58	0.340	U	0.340
RB-3	J14JT5	2/21/07	10.9		0.74	0.254		0.11	0.444		0.32	0.056	U	0.056	0.430		0.110	0.444		0.32	0.270	U	0.270
Inprocess	J15W94	10/23/07	13.5		0.373	0.460		0.063	0.681		0.127	0.025	U	0.025	0.705		0.044	0.681		0.127	0.130	U	0.130
Inprocess	J15W95	10/23/07	13.3		0.118	0.426		0.022	0.668		0.054	0.009	U	0.009	0.623		0.016	0.668		0.054	0.053	U	0.053
OB-1	J16947	2/6/08	12.6		0.272	0.453		0.053	0.650		0.118	0.022	U	0.022	0.769		0.052	0.650		0.118	0.112	U	0.112
OB-2	J16948	2/6/08	11.9		0.582	0.385		0.157	0.781		0.308	0.054	U	0.054	0.679		0.130	0.781		0.308	0.265	U	0.265
OB-3	J16949	2/6/08	13.6		0.216	0.466		0.045	0.705		0.109	0.017	U	0.017	0.634		0.031	0.705		0.109	0.109	U	0.109
OB-4	J16950	2/6/08	13.4		0.355	0.442		0.069	0.749		0.148	0.026	U	0.026	0.700		0.044	0.749		0.148	0.139	U	0.139
OB-5	J16951	2/11/08	13.6		0.259	0.485		0.060	0.732		0.132	0.023	U	0.023	0.668		0.038	0.732		0.132	0.117	U	0.117
OB-6	J16952	2/11/08	15.7		0.271	0.541		0.066	0.862		0.132	0.020	U	0.020	0.772		0.039	0.862		0.132	0.145	U	0.145
OB-7	J16953	2/11/08	14.7		0.360	0.428		0.068	0.840		0.135	0.027	U	0.027	0.760		0.046	0.840		0.135	0.166	U	0.166
OB-8	J16954	2/11/08	16.6		0.236	0.538		0.051	0.726		0.116	0.020	U	0.020	0.769		0.034	0.726		0.116	0.131	U	0.131
OB-9	J16955	2/11/08	14.8		0.491	0.573		0.073	0.744		0.163	0.030	U	0.030	0.726		0.052	0.744		0.163	0.179	U	0.179
OB-10	J16956	2/11/08	11.0		0.277	0.707		0.064	0.831		0.133	0.022	U	0.022	0.867		0.038	0.831		0.133	0.116	U	0.116
OB-11	J16957	2/11/08	14.9		0.240	0.487		0.044	0.743		0.088	0.017	U	0.017	0.652		0.032	0.743		0.088	0.120	U	0.120
OB-12	J16958	2/11/08	11.7		0.329	0.394		0.052	0.761		0.120	0.020	U	0.020	0.633		0.034	0.761		0.120	0.109	U	0.109
OB-13	J16959	2/11/08	14.1		0.344	0.480		0.073	0.738		0.155	0.025	U	0.025	0.665		0.046	0.738		0.155	0.151	U	0.151
OB-14	J16960	2/11/08	14.3		0.189	0.590		0.039	0.793		0.082	0.017	U	0.017	0.825		0.032	0.793		0.082	0.109	U	0.109
SP-1	J16961	2/12/08	14.2		0.345	0.500		0.061	0.780		0.146	0.024	U	0.024	0.693		0.042	0.780		0.146	0.124	U	0.124
SP-2	J16962	2/12/08	6.4		0.440	0.191		0.082	0.584		0.168	0.033	U	0.033	0.490		0.054	0.584		0.168	0.158	U	0.158
SP-3	J16963	2/12/08	13.7		0.302	0.479		0.051	0.732		0.112	0.017	U	0.017	0.638		0.033	0.732		0.112	0.097	U	0.097
SP-4	J16964	2/12/08	12.3		0.349	0.484		0.070	0.680		0.149	0.025	U	0.025	0.678		0.044	0.680		0.149	0.156	U	0.156
SP-5	J16965	2/12/08	11.8		0.926	0.486		0.157	0.751		0.394	0.065	U	0.065	0.907		0.153	0.751		0.394	0.315	U	0.315
SP-6	J16966	2/12/08	12.8		0.746	0.418		0.165	0.526		0.348	0.073	U	0.073	0.779		0.190	0.526		0.348	0.316	U	0.316
SP-7	J16967	2/12/08	13.7		0.531	0.401		0.103	0.634		0.220	0.052	U	0.052	0.831		0.128	0.634		0.220	0.268	U	0.268
SP-8	J16968	2/12/08	13.6		0.347	0.510		0.071	0.722		0.131	0.024	U	0.024	0.825		0.063	0.722		0.131	0.122	U	0.122
SP-9	J16969	2/12/08	11.5		0.304	0.390		0.063	0.627		0.134	0.025	U	0.025	0.897		0.059	0.627		0.134	0.108	U	0.108
SP-10	J16970	2/12/08	13.0		0.184	0.385		0.048	0.727		0.091	0.017	U	0.017	0.753		0.047	0.727		0.091	0.101	U	0.101
Dup. of SP-10	J16971	2/12/08	9.4		0.637	0.301		0.134	0.388		0.315	0.053	U	0.053	0.516		0.084	0.388		0.315	0.231	U	0.231
FS-3	J169W9	2/13/08	10.4		0.797	0.617		0.137	0.821		0.296	0.054	U	0.054	0.604		0.079	0.821	J	0.296	0.272	U	0.272
FS-4	J169X0	2/13/08	12.0		0.705	0.369		0.124	0.596		0.223	0.048	U	0.048	0.571		0.089	0.596	J	0.223	0.272	U	0.272
FS-5	J169X1	2/13/08	9.0		0.774	0.282		0.165	0.833		0.349	0.068	U	0.068	0.531		0.106	0.833	J	0.349	0.278	U	0.278
FS-1	J16945	2/13/08	9.2		1.1	0.316		0.219	0.639		0.484	0.086	U	0.086	0.682		0.193	0.639	J	0.484	0.428	U	0.428
FS-2	J16946	2/13/08	11.6		0.821	0.644		0.130	0.640		0.268	0.051	U	0.051	0.881		0.130	0.640	J	0.268	0.266	U	0.266
SZ-1	J16934	2/14/08	13.2		0.804	0.348		0.158	0.477		0.383	0.055	U	0.055	0.533		0.095	0.477		0.383	0.303	U	0.303
SZ-2	J16935	2/14/08	13.3		0.379	0.353		0.123	0.668		0.207	0.043	U	0.043	0.708		0.101	0.668		0.207	0.239	U	0.239
SZ-3	J16936	2/14/08	13.4		0.795	0.415		0.120	0.578		0.332	0.057	U	0.057	0.549		0.085	0.578		0.332	0.272	U	0.272
SZ-4	J16937	2/14/08	13.7		0.525	0.404		0.112	0.472		0.264	0.047	U	0.047	0.733		0.117	0.472		0.264	0.226	U	0.226
SZ-5	J16938	2/14/08	14.3		0.412	0.479		0.128	0.962		0.238	0.049	U	0.049	0.536		0.074	0.962		0.238	0.225	U	0.225
SZ-6	J16939	2/14/08	12.6		0.658	0.540		0.162	0.651		0.358	0.059	U	0.059	0.588		0.084	0.651		0.358	0.289	U	0.289
SZ-7	J16940	2/14/08	11.8		0.757	0.349		0.174	0.953		0.259	0.048	U	0.048	0.571		0.130	0.953		0.259	0.273	U	0.273
SZ-8	J16941	2/14/08	12.8		0.526	0.326		0.103	0.449		0.277	0.047	U	0.047	0.596		0.124	0.449		0.277	0.266	U	0.266
SZ-9	J16942	2/14/08	11.9		0.540	0.441		0.108	0.570		0.235	0.042	U	0.042	0.780		0.097	0.570		0.235	0.217	U	0.217
SZ-10	J16943	2/14/08	13.0		0.274	0.456		0.084	0.740		0.130	0.031	U	0.031	0.669		0.052	0.740		0.130	0.182	U	0.182
Dup. of SZ-10	J16944	2/14/08	7.5		0.591	0.403		0.102	0.543		0.209	0.042	U	0.042	0.572		0.070	0.543		0.209	0.188	U	0.188
OB-1	J16M53	4/10/08	9.5		0.247	0.655		0.058	0.790		0.115	0.020	U	0.020	0.720		0.031	0.790		0.115	0.108	U	0.108

Table B-4. 100-F-26:9 Radionuclide Verification Data Results. (3 Pages)

Sample Location	HEIS Number	Sample Date	Uranium-238			Strontium			Gross alpha			Gross beta		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
RC-1	J14JT0	2/14/07	12.0	U	12.0				9.16		5.7	17.0		8.9
RB-1	J14JT1	2/14/07	11.0	U	11.0				7.46		4.9	18.1		5.4
RB-2	J14JT2	2/14/07	12.0	U	12.0				14.3		6.8	19.5		5.7
RC-2	J14JT3	2/14/07	8.2	U	8.2				3.50	U	8.0	16.8		5.6
RC-3	J14JT4	2/20/07	9.2	U	9.2				4.44	U	5.5	18.0		5.5
RC-4	J13W57	2/21/07	16.0	U	16.0				11.4		6.5	23.4		8.6
RB-3	J14JT5	2/21/07	10.0	U	10.0				10.1		4.9	20.4		5.4
Inprocess	J15W94	10/23/07	4.3	U	4.27									
Inprocess	J15W95	10/23/07	1.4	U	1.4									
OB-1	J16947	2/6/08	3.8	U	3.8				6.28		6.16	27.3		5.42
OB-2	J16948	2/6/08	8.4	U	8.4				1.47	U	7.41	20.8		6.35
OB-3	J16949	2/6/08	4.3	U	4.3				9.50		4.77	22.7		5.37
OB-4	J16950	2/6/08	4.1	U	4.1				10.3		5.17	18.6		5.54
OB-5	J16951	2/11/08	4.1	U	4.1	0.048	U	0.258	8.33		6.08	14.8		6.21
OB-6	J16952	2/11/08	3.4	U	3.4				10.1		6.29	15.4		6.28
OB-7	J16953	2/11/08	4.4	U	4.4				4.57	U	5.72	15.8		5.33
OB-8	J16954	2/11/08	2.9	U	2.9				15.0		4.99	18.3		5.48
OB-9	J16955	2/11/08	5.2	U	5.2				9.05		5.96	20.6		7.67
OB-10	J16956	2/11/08	3.8	U	3.8				11.4		9.90	17.2		5.86
OB-11	J16957	2/11/08	2.9	U	2.9				14.0		5.07	17.2		5.70
OB-12	J16958	2/11/08	3.2	U	3.2				9.97		7.32	22.1		5.67
OB-13	J16959	2/11/08	4.6	U	4.6				5.63	U	7.54	16.1		5.61
OB-14	J16960	2/11/08	2.6	U	2.6				9.82		6.76	19.3		8.86
SP-1	J16961	2/12/08	3.9	U	3.9				13.5		6.63	17.6		6.07
SP-2	J16962	2/12/08	5.0	U	5.0				11.0		8.13	23.7		9.15
SP-3	J16963	2/12/08	3.1	U	3.1				3.45	U	6.70	12.6		5.63
SP-4	J16964	2/12/08	3.8	U	3.8				16.3		8.94	21.1		5.39
SP-5	J16965	2/12/08	11.4	U	11.4				12.3		7.43	20.8		8.76
SP-6	J16966	2/12/08	11.5	U	11.5				10.5		5.33	18.9		5.53
SP-7	J16967	2/12/08	6.4	U	6.4				6.41	U	7.20	16.5		6.11
SP-8	J16968	2/12/08	4.1	U	4.1				7.26	U	8.46	24.7		9.25
SP-9	J16969	2/12/08	3.9	U	3.9				8.79		7.11	19.6		5.41
SP-10	J16970	2/12/08	2.5	U	2.5				14.4		6.91	19.7		6.36
Dup. of SP-10	J16971	2/12/08	8.4	U	8.4				9.00		5.96	15.5		5.36
FS-3	J169W9	2/13/08	8.1	U	8.1				7.33		6.70	18.4		6.05
FS-4	J169X0	2/13/08	7.8	U	7.8				13.7		7.07	19.1		9.25
FS-5	J169X1	2/13/08	10.7	U	10.7				16.8		5.80	26.2		5.39
FS-1	J16945	2/13/08	13.2	U	13.2				14.4		5.59	21.5		6.21
FS-2	J16946	2/13/08	8.1	U	8.1				21.3		5.07	19.1		5.26
SZ-1	J16934	2/14/08	11.0	U	11.0				5.89	U	6.68	15.3		6.09
SZ-2	J16935	2/14/08	5.8	U	5.8				12.5		6.90	17.3		5.41
SZ-3	J16936	2/14/08	9.4	U	9.4				9.89		7.44	21.6		6.42
SZ-4	J16937	2/14/08	7.8	U	7.8				10.6		5.73	18.8		5.41
SZ-5	J16938	2/14/08	7.4	U	7.4				11.0		5.58	18.9		5.72
SZ-6	J16939	2/14/08	10.2	U	10.2				9.96		6.52	17.5		7.65
SZ-7	J16940	2/14/08	9.8	U	9.8				2.08	U	7.55	19.5		5.81
SZ-8	J16941	2/14/08	7.5	U	7.5				9.88		8.29	14.2		5.80
SZ-9	J16942	2/14/08	6.6	U	6.6				7.48	U	8.82	20.9		5.74
SZ-10	J16943	2/14/08	4.3	U	4.3				6.98	U	7.71	19.9		9.00
Dup. of SZ-10	J16944	2/14/08	6.4	U	6.4				10.7		7.81	22.5		8.77
OB-1	J16M53	4/10/08	3.07	U	3.07				16.8		5.42	21.2		5.46

Table B-5. 100-F-26:9 Inorganic Verification Data Results. (4 Pages)

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium			Boron			Cadmium		
			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
RC-1	J14JT0	2/14/07	3660	C	6.3	0.75	U	0.75	2.3		0.93	56.5	C	0.03	0.36		0.03	1.6	C	0.57	0.23		0.09
RB-1	J14JT1	2/14/07	5150	C	6.3	0.74	U	0.74	2.7		0.92	48.6	C	0.03	0.31		0.03	2.1	C	0.56	0.11		0.09
RB-2	J14JT2	2/14/07	4890	C	6.2	0.74	U	0.74	1.9		0.91	54.4	C	0.03	0.32		0.03	1.9	C	0.56	0.16		0.09
Inprocess	J14JT7	2/14/07	5480		6.7	1.2		0.80	0.99	U	0.99	70.7	C	0.03	0.41		0.03	2.3		0.6	0.1	U	0.1
RC-2	J14JT3	2/14/07	4900		6.3	0.74	U	0.74	0.92	U	0.92	53.1	C	0.03	0.39		0.03	1.3		0.56	0.09	U	0.09
RC-3	J14JT4	2/20/07	3620		6.2	0.73	U	0.73	1.3		0.9	24.1	C	0.03	0.18		0.03	0.56	U	0.55	0.09	U	0.09
RC-4	J13W57	2/21/07	4820		5.4	1.6		0.97	2.5		1.2	51	C	0.06	0.2		0.03	2		1.2	0.09	U	0.09
RB-3	J14JT5	2/21/07	4010		5.4	0.97	U	0.97	2.3		1.2	40.5	C	0.06	0.11		0.03	1.2		1.2	0.09	U	0.09
Inprocess	J15W94	10/23/07	5420		11.1	0.83	U	0.83	2.7		1.4	69.9		0.28	0.14	U	0.14	9.4		1.4	0.28	U	0.28
Inprocess	J15W95	10/23/07	6140		11.6	0.87	U	0.87	2.5		1.5	102		0.29	0.24		0.15	5.6		1.5	0.29	U	0.29
OB-1	J16947	2/6/08	5300		11.8	0.89	U	0.89	2.9		1.5	126	C	0.3	0.25		0.15	6.3		1.5	0.15	U	0.15
OB-2	J16948	2/6/08	5010		13.3	1.00	U	1.0	2.3		1.7	69.3	C	0.33	0.24		0.17	3.3		1.7	0.17	U	0.17
OB-3	J16949	2/6/08	4580		12.2	0.92	U	0.92	2.0		1.5	107	C	0.31	0.25		0.15	5.1		1.5	0.15	U	0.15
OB-4	J16950	2/6/08	4270		12.6	0.95	U	0.95	2.2		1.6	53.3	C	0.32	0.19		0.16	1.6	U	1.6	0.16	U	0.16
OB-5	J16951	2/11/08	6030		12.3	0.93	U	0.93	2.2		1.5	73.6		0.31	0.20		0.15	2.7		1.5	0.15	U	0.15
OB-6	J16952	2/11/08	6590		11.3	0.85	U	0.85	2.9		1.4	86.9		0.28	0.29		0.14	4.8		1.4	0.14	U	0.14
OB-7	J16953	2/11/08	5720		11.5	0.87	U	0.87	2.9		1.4	52.9		0.29	0.23		0.14	1.4	U	1.4	0.14	U	0.14
OB-8	J16954	2/11/08	5680		11.5	1.0		0.87	1.4	U	1.4	54.6		0.29	0.23		0.14	1.4	U	1.4	0.14	U	0.14
OB-9	J16955	2/11/08	6070		12.3	0.93	U	0.93	3.5		1.5	66.4		0.31	0.28		0.15	1.8		1.5	0.15	U	0.15
OB-10	J16956	2/11/08	9650		11.8	0.89	U	0.89	4.2		1.5	520		0.30	0.61		0.15	48.5		1.5	0.15	U	0.15
OB-11	J16957	2/11/08	4680		11.6	0.87	U	0.87	1.5	U	1.5	53.5		0.29	0.15	U	0.15	1.5	U	1.5	0.15	U	0.15
OB-12	J16958	2/11/08	5040		12.7	0.95	U	0.95	2.2		1.6	80.7		0.32	0.16	U	0.16	8.0		1.6	0.16	U	0.16
OB-13	J16959	2/11/08	4830		12.8	0.96	U	0.96	1.7		1.6	54.7		0.32	0.16	U	0.16	1.6	U	1.6	0.16	U	0.16
OB-14	J16960	2/11/08	6900		11.0	0.83	U	0.83	2.8		1.4	184		0.28	0.20		0.14	14.3		1.4	0.14	U	0.14
SP-1	J16961	2/12/08	5850		10.7	0.80	U	0.80	1.6		1.3	52.1		0.27	0.38		0.13	1.3	U	1.3	0.13	U	0.13
SP-2	J16962	2/12/08	5520		9.8	0.74	U	0.74	3.1		1.2	46.7		0.25	0.41		0.12	1.2	U	1.2	0.12	U	0.12
SP-3	J16963	2/12/08	5250		10.0	0.75	U	0.75	2.7		1.3	49.1		0.25	0.39		0.13	1.3	U	1.3	0.13	U	0.13
SP-4	J16964	2/12/08	5270		9.9	0.74	U	0.74	2.6		1.2	46.2		0.25	0.37		0.12	1.2	U	1.2	0.12	U	0.12
SP-5	J16965	2/12/08	7480		10.5	0.79	U	0.79	18.3		1.3	66.3		0.26	0.51		0.13	1.3	U	1.3	0.13	U	0.13
SP-6	J16966	2/12/08	6260		9.7	0.73	U	0.73	2.7		1.2	66.2		0.24	0.45		0.12	1.8		1.2	0.12	U	0.12
SP-7	J16967	2/12/08	6770		11.4	0.86	U	0.86	2.3		1.4	52.0		0.28	0.48		0.14	1.4	U	1.4	0.14	U	0.14
SP-8	J16968	2/12/08	5730		8.9	0.67	U	0.67	2.7		1.1	55.6		0.22	0.44		0.11	1.5		1.1	0.11	U	0.11
SP-9	J16969	2/12/08	6020		11.5	0.86	U	0.86	2.8		1.4	63.8		0.29	0.46		0.14	1.4	U	1.4	0.14	U	0.14
SP-10	J16970	2/12/08	5760		10.5	0.78	U	0.78	2.4		1.3	45.0		0.26	0.44		0.13	1.3	U	1.3	0.13	U	0.13
Dup. of SP-10	J16971	2/12/08	5520		7.0	0.52	U	0.52	2.5		0.87	46.2		0.17	0.46		0.09	0.87	U	0.87	0.09	U	0.09
FS-3	J169W9	2/13/08	7340		11.0	0.82	U	0.82	2.1		1.4	192	C	0.27	0.20		0.14	23.2		1.4	0.14	U	0.14
FS-4	J169X0	2/13/08	5810		11.4	0.86	U	0.86	2.3		1.4	81.1	C	0.28	0.14	U	0.14	3.7		1.4	0.14	U	0.14
FS-5	J169X1	2/13/08	5510		10.0	0.75	U	0.75	2.3		1.2	82.3	C	0.25	0.13		0.12	3.4		1.2	0.12	U	0.12
FS-1	J16945	2/13/08	4920		10.2	0.77	U	0.77	1.3	U	1.3	66.5	C	0.26	0.13	U	0.13	1.9		1.3	0.13	U	0.13
FS-2	J16946	2/13/08	11900		18.0	0.68	U	0.68	1.3		1.1	329	C	0.22	0.27		0.11	28.6		1.1	0.11	U	0.11
Equip. blank	J16933	2/14/08	69.6		3.4	0.26	U	0.26	0.43	U	0.43	1.8		0.09	0.06		0.04	0.43	U	0.43	0.04	U	0.04
SZ-1	J16934	2/14/08	4900		10.2	0.76	U	0.76	3.3		1.3	62.5		0.25	0.23		0.13	2.4		1.3	0.13	U	0.13
SZ-2	J16935	2/14/08	4990		10.4	0.78	U	0.78	2.7		1.3	56.1		0.26	0.22		0.13	2.6		1.3	0.20		0.13
SZ-3	J16936	2/14/08	4500		10.8	0.81	U	0.81	2.2		1.4	64.7		0.27	0.21		0.14	3.1		1.4	0.14	U	0.14
SZ-4	J16937	2/14/08	5090		11.8	0.89	U	0.89	2.5		1.5	63.0		0.30	0.20		0.15	2.9		1.5	0.15	U	0.15
SZ-5	J16938	2/14/08	4240		9.3	0.70	U	0.70	1.8		1.2	41.6		0.23	0.17		0.12	1.2	U	1.2	0.12	U	0.12
SZ-6	J16939	2/14/08	4570		12.1	0.91	U	0.91	1.5	U	1.5	91.9		0.30	0.26		0.15	6.2		1.5	0.15	U	0.15
SZ-7	J16940	2/14/08	4820		11.1	0.84	U	0.84	1.7		1.4	56.2		0.28	0.27		0.14	1.8		1.4	0.14	U	0.14
SZ-8	J16941	2/14/08	4780		10.3	0.77	U	0.77	2.3		1.3	59.1		0.26	0.25		0.13	1.9		1.3	0.13	U	0.13
SZ-9	J16942	2/14/08	6250		11.3	0.85	U	0.85	2.1		1.4	226		0.28	0.34		0.14	23.7		1.4	0.14	U	0.14
SZ-10	J16943	2/14/08	5980		11.3	0.85	U	0.85	2.1		1.4	73.6		0.28	0.25		0.14	3.6		1.4	0.14	U	0.14
Dup. of SZ-10	J16944	2/14/08	6570		12.1	0.91	U	0.91	3.0		1.5	117		0.30	0.28		0.15	4.2		1.5	0.16		0.15
OB-1	J16M53	4/10/08	9350		11.3	0.85	U	0.85	2.5		1.4	659		0.28	0.86		0.14	61.7		1.4	0.16		0.14

Table B-5. 100-F-26:9 Inorganic Verification Data Results. (4 Pages)

Sample Location	HEIS Number	Sample Date	Calcium			Chromium			Hexavalent Chromium			Cobalt			Copper			Iron			Lead		
			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
RC-1	J14JT0	2/14/07	2750	C	3.7	5.4	C	0.36	0.29		0.22	5.3		0.15	10.5	C	0.21	13900	C	7.3	3.9		0.48
RB-1	J14JT1	2/14/07	3540	C	3.7	7.7	C	0.36	0.24		0.21	5.4		0.15	12.9	C	0.21	13000	C	7.3	3.3		0.48
RB-2	J14JT2	2/14/07	3630	C	3.7	7.3	C	0.35	0.23		0.21	5.4		0.15	13	C	0.24	15000	C	7.2	3.5		0.47
Inprocess	J14JT7	2/14/07	3600	C	4.0	1200	C	0.38	2000		90.7	6.5		0.16	13	C	0.22	22600		7.8	4.2		0.51
RC-2	J14JT3	2/14/07	3290	C	3.7	8.9	C	0.36	0.21	U	0.21	5.5		0.15	10.5	C	0.21	16100		7.2	3.6		0.47
RC-3	J14JT4	2/20/07	4730	C	3.6	6.8	C	0.35	0.20	U	0.20	3.7		0.15	9.9		0.20	9380	C	1.8	2.7		0.47
RC-4	J13W57	2/21/07	3860	C	5.5	8.0	C	0.24	0.21	U	0.21	5.4		0.27	11.5		0.36	15300	C	1.2	3.9		0.85
RB-3	J14JT5	2/21/07	5130	C	5.5	7.9	C	0.24	0.21	U	0.21	3.8		0.27	10.6		0.36	10800	C	1.2	2.3		0.85
Inprocess	J15W94	10/23/07	4000	C	11.1	6.4		0.56	0.25	U	0.25	5.3		0.56	10.7		0.56	15600		12.5	3.6		0.83
Inprocess	J15W95	10/23/07	5270	C	11.6	11.2		0.58	0.47		0.24	5.2		0.58	10.8		0.58	16500		13.1	10.8		0.87
OB-1	J16947	2/6/08	5760	C	11.8	7.4		0.59	0.22	U	0.22	5.5		0.59	15.8	C	0.59	14800		13.3	12.3		0.89
OB-2	J16948	2/6/08	4050	C	13.3	6.2		0.67	0.53		0.26	5.4		0.67	20.9	C	0.67	13900		15.0	2.6		1.00
OB-3	J16949	2/6/08	5590	C	12.2	5.9		0.61	0.24	U	0.24	4.8		0.61	14.2	C	0.61	9930		13.7	4.4		0.92
OB-4	J16950	2/6/08	3510	C	12.6	5.3		0.63	0.23	U	0.23	5.2		0.63	13.0	C	0.63	13200		14.2	2.5		0.95
OB-5	J16951	2/11/08	4060	C	12.3	8.0		0.62	0.21	U	0.21	6.1		0.62	19.9	C	0.62	15800		13.9	4.0		0.93
OB-6	J16952	2/11/08	4150	C	11.3	8.5		0.57	0.25		0.22	6.6		0.57	13.2	C	0.57	17000		12.7	4.4		0.85
OB-7	J16953	2/11/08	5350	C	11.5	9.0		0.58	0.24		0.21	5.7		0.58	14.3	C	0.58	15400		13.0	7.4		0.87
OB-8	J16954	2/11/08	4790	C	11.5	8.9		0.58	0.28		0.21	5.5		0.58	15.0	C	0.58	15100		13.0	8.5		0.87
OB-9	J16955	2/11/08	3800	C	12.3	7.9		0.62	0.28		0.22	6.6		0.62	12.2	C	0.62	17800		13.9	3.8		0.93
OB-10	J16956	2/11/08	12900	C	11.8	10.6		0.59	0.22	U	0.22	7.3		0.59	22.3	C	0.59	18200		13.3	11.7		0.89
OB-11	J16957	2/11/08	4390	C	11.6	7.1		0.58	0.26		0.21	5.9		0.58	10.4	C	0.58	16100		13.1	5.0		0.87
OB-12	J16958	2/11/08	5240	C	12.7	6.7		0.63	0.21	U	0.21	6.3		0.63	13.3	C	0.63	17300		14.3	2.8		0.95
OB-13	J16959	2/11/08	3560	C	12.8	6.5		0.64	0.29		0.22	5.5		0.64	10.5	C	0.64	16100		14.4	3.4		0.96
OB-14	J16960	2/11/08	9600	C	11.0	8.7		0.55	0.22	U	0.22	6.4		0.55	18.8	C	0.55	16200		12.4	8.8		0.83
SP-1	J16961	2/12/08	3480	C	10.7	9.5	C	0.54	0.22	U	0.22	5.4		0.54	13.7		0.62	14500		12.1	4.0		0.80
SP-2	J16962	2/12/08	4000	C	9.8	8.5	C	0.49	0.22	U	0.22	5.5		0.49	13.5		0.57	13700		11.1	5.4		0.74
SP-3	J16963	2/12/08	4680	C	10.0	10.4	C	0.50	0.36		0.22	5.2		0.50	16.5		0.58	14200		11.3	6.9		0.75
SP-4	J16964	2/12/08	3600	C	9.9	8.7	C	0.50	0.23		0.22	5.0		0.50	12.7		0.57	13200		11.3	4.8		0.74
SP-5	J16965	2/12/08	3820	C	10.5	11.0	C	0.52	0.27		0.22	6.1		0.52	14.9		0.60	16700		11.8	60.1		0.79
SP-6	J16966	2/12/08	5430	C	9.7	11.0	C	0.48	0.26		0.23	5.7		0.48	13.3		0.56	15000		10.9	11.2		0.73
SP-7	J16967	2/12/08	4120	C	11.4	10.7	C	0.57	0.23	U	0.23	6.1		0.57	17.2		0.66	16200		12.8	4.6		0.86
SP-8	J16968	2/12/08	3710	C	8.9	8.9	C	0.45	0.23	U	0.23	5.6		0.45	12.9		0.51	14000		10.0	5.4		0.67
SP-9	J16969	2/12/08	3760	C	11.5	10.4	C	0.58	0.23	U	0.23	5.8		0.58	15.4		0.66	14600		13.0	5.6		0.86
SP-10	J16970	2/12/08	3270	C	10.5	9.4	C	0.52	0.24		0.22	5.4		0.52	15.6		0.60	14400		11.8	4.1		0.78
Dup. of SP-10	J16971	2/12/08	3370	C	7.0	8.8	C	0.35	0.22	U	0.22	5.7		0.35	14.9		0.40	14800		7.9	4.1		0.52
FS-3	J169W9	2/13/08	7080	C	11.0	8.8		0.55	0.36		0.21	6.0		0.55	13.4		0.93	17000	C	12.3	4.4		0.82
FS-4	J169X0	2/13/08	4380	C	11.4	8.6		0.57	0.21		0.21	6.2		0.57	12.3		0.66	17200	C	12.8	3.5		0.86
FS-5	J169X1	2/13/08	4300	C	10.0	8.2		0.50	0.21	U	0.21	5.8		0.50	13.1		0.57	15600	C	11.2	3.9		0.75
FS-1	J16945	2/13/08	4130	C	10.2	9.0		0.51	0.30		0.22	4.8		0.51	12.8		0.59	14300	C	11.5	4.1		0.77
FS-2	J16946	2/13/08	8740	C	9.0	7.9		0.45	0.30		0.22	4.7		0.45	26.5		1.0	25200	C	20.2	16.9		0.68
Equip. blank	J16933	2/14/08	31.7		3.4	0.17	U	0.17				0.17	U	0.17	U		0.17	1790		3.8	0.31		0.26
SZ-1	J16934	2/14/08	7880		10.2	8.3		0.51	0.21	U	0.21	5.5		0.51	14.1		0.51	15100		11.4	6.1		0.76
SZ-2	J16935	2/14/08	4270		10.4	9.2		0.52	0.21	U	0.21	5.8		0.52	15.7		0.52	15600		11.7	7.0		0.78
SZ-3	J16936	2/14/08	4020		10.8	7.0		0.54	0.24		0.21	5.5		0.54	12.4		0.54	14800		12.2	5.5		0.81
SZ-4	J16937	2/14/08	3290		11.8	9.7		0.59	0.22	U	0.22	4.6		0.59	16.0		0.59	13400		13.3	6.6		0.89
SZ-5	J16938	2/14/08	4120		9.3	7.3		0.47	0.23		0.21	4.6		0.47	11.1		0.47	12300		10.5	3.5		0.70
SZ-6	J16939	2/14/08	4830		12.1	6.7		0.61	0.22	U	0.22	6.0		0.61	11.3		0.61	15800		13.6	3.8		0.91
SZ-7	J16940	2/14/08	3970		11.1	7.6		0.56	0.26		0.21	6.7		0.56	11.3		0.56	18300		12.5	4.0		0.84
SZ-8	J16941	2/14/08	3840		10.3	7.7		0.52	0.22	U	0.22	6.7		0.52	10.6		0.52	18600		11.6	3.0		0.77
SZ-9	J16942	2/14/08	7170		11.3	8.7		0.56	0.22	U	0.22	6.2		0.56	15.5		0.56	17100		12.7	5.6		0.85
SZ-10	J16943	2/14/08	3050		11.3	8.7		0.57	0.23	U	0.23	6.3		0.57	9.0		0.57	16900		12.7	4.4		0.85
Dup. of SZ-10	J16944	2/14/08	3940		12.1	12.5		0.61	0.38		0.23	7.1		0.61	17.0		0.61	19300		13.6	4.9		0.91
OB-1	J16M53	4/10/08	15200		11.3	12.5		0.57	0.43	U	0.43	7.6		0.57	183		0.57	19000		12.7	81.7		0.85

Table B-5. 100-F-26:9 Inorganic Verification Data Results. (4 Pages)

Sample Location	HEIS Number	Sample Date	Magnesium			Manganese			Mercury			Molybdenum			Nickel			Potassium			Selenium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
RC-1	J14JT0	2/14/07	2970	C	1.4	268		0.12	0.03		0.02	0.48	U	0.48	7.9		0.66	635		6.3	1.3	U	1.3
RB-1	J14JT1	2/14/07	3460	C	1.4	244		0.12	0.02	U	0.02	0.48	U	0.48	8.7		0.65	946		6.3	1.3	U	1.3
RB-2	J14JT2	2/14/07	3480	C	1.4	232		0.12	0.01	U	0.01	0.47	U	0.47	9.3		0.65	770		6.2	1.3	U	1.3
Inprocess	J14JT7	2/14/07	3670	C	1.5	304		0.13	0.01	U	0.01	1.3		0.51	11.6		0.7	1040	C	6.7	1.4	U	1.4
RC-2	J14JT3	2/14/07	3340	C	1.4	268		0.12	0.02	U	0.02	0.47	U	0.47	9.1		0.65	929	C	6.3	1.3	U	1.3
RC-3	J14JT4	2/20/07	2880	C	1.3	187		0.12	0.02	U	0.02	0.47	U	0.47	7.2		0.64	438		6.2	1.3	U	1.3
RC-4	J13W57	2/21/07	3540		2.2	251		0.06	0.02	U	0.02	0.53		0.39	9.1		0.58	790		14.8	1.3	C	1.1
RB-3	J14JT5	2/21/07	3410		2.2	193		0.06	0.02	U	0.02	0.39	U	0.39	8.5		0.58	469		14.8	1.1	UC	1.1
Inprocess	J15W94	10/23/07	3280		6.9	278	C	0.11	0.02	U	0.02	0.83	U	0.83	8.8		0.56	1070		11.1	1.7	U	1.7
Inprocess	J15W95	10/23/07	3710		7.3	286	C	0.12	0.02	U	0.02	0.87	U	0.87	10.6		0.58	1110		11.6	1.7	U	1.7
OB-1	J16947	2/6/08	3780	C	7.4	253	C	0.12	0.01		0.01	0.89	U	0.89	9.5		0.59	806		11.8	1.8	U	1.8
OB-2	J16948	2/6/08	3470	C	8.3	230	C	0.13	0.01	U	0.01	1.30		1.00	8.4		0.67	1030		13.3	2.0	U	2.0
OB-3	J16949	2/6/08	2870	C	7.6	246	C	0.12	0.01	U	0.01	0.92	U	0.92	8.5		0.61	964		12.2	1.8	U	1.8
OB-4	J16950	2/6/08	3010	C	7.9	229	C	0.13	0.01	U	0.01	0.95		0.95	7.9		0.63	971		12.6	1.9	U	1.9
OB-5	J16951	2/11/08	3560		7.7	273	C	0.12	0.01	U	0.01	0.93	U	0.93	9.6		0.62	961		12.3	1.9	U	1.9
OB-6	J16952	2/11/08	3910		7.1	302	C	0.11	0.01	U	0.01	0.85	U	0.85	10.0		0.57	1110		11.3	1.7	U	1.7
OB-7	J16953	2/11/08	3840		7.2	253	C	0.12	0.09		0.01	0.87	U	0.87	10.5		0.58	788		11.5	1.7	U	1.7
OB-8	J16954	2/11/08	3810		7.2	261	C	0.12	0.01	U	0.01	0.87	U	0.87	10.8		0.58	793		11.5	1.7	U	1.7
OB-9	J16955	2/11/08	3800		7.7	296	C	0.12	0.01	U	0.01	0.93	U	0.93	10.0		0.62	1100		12.3	1.9	U	1.9
OB-10	J16956	2/11/08	5890		7.4	290	C	0.12	0.10		0.01	0.89		0.89	14.7		0.56	1010		11.8	1.8	U	1.8
OB-11	J16957	2/11/08	3530		7.3	253	C	0.12	0.01	U	0.01	0.87	U	0.87	8.7		0.58	803		11.6	1.7	U	1.7
OB-12	J16958	2/11/08	4010		7.9	245	C	0.13	0.01	U	0.01	0.95	U	0.95	9.1		0.63	825		12.7	1.9	U	1.9
OB-13	J16959	2/11/08	3340		8.0	252	C	0.13	0.01	U	0.01	0.96	U	0.96	8.0		0.64	1080		12.8	1.9	U	1.9
OB-14	J16960	2/11/08	4080		6.9	310	C	0.11	0.09		0.01	0.83	U	0.83	10.6		0.55	1030		11.0	1.7	U	1.7
SP-1	J16961	2/12/08	3460		6.7	240	C	0.11	0.01	U	0.01	0.80	U	0.80	10.3		0.54	1030		132	1.6	U	1.6
SP-2	J16962	2/12/08	3470		6.1	236	C	0.10	0.009	U	0.009	0.75		0.74	10.4		0.49	929		121	1.5	U	1.5
SP-3	J16963	2/12/08	3510		6.3	230	C	0.10	0.02		0.008	0.75	U	0.75	9.9		0.50	897		123	1.5	U	1.5
SP-4	J16964	2/12/08	3340		6.2	228	C	0.10	0.009	U	0.009	0.74	U	0.74	10.0		0.50	941		122	1.5	U	1.5
SP-5	J16965	2/12/08	4300		6.5	268	C	0.10	0.01	U	0.01	0.79	U	0.79	11.7		0.52	1130		129	1.6	U	1.6
SP-6	J16966	2/12/08	3930		6.0	268	C	0.10	0.12		0.009	0.73	U	0.73	10.8		0.48	1300		119	1.5	U	1.5
SP-7	J16967	2/12/08	4210		7.1	267	C	0.11	0.009	U	0.009	0.86	U	0.86	12.0		0.57	1140		140	1.7	U	1.7
SP-8	J16968	2/12/08	3730		4.5	261	C	0.09	0.01	U	0.01	0.67	U	0.67	10.1		0.45	1180		110	1.3	U	1.3
SP-9	J16969	2/12/08	3660		7.2	285	C	0.12	0.01	U	0.01	0.86	U	0.86	10.8		0.58	1180		142	1.7	U	1.7
SP-10	J16970	2/12/08	3690		6.5	233	C	0.10	0.01	U	0.01	0.78	U	0.78	11.5		0.52	911		129	1.6	U	1.6
Dup. of SP-10	J16971	2/12/08	3630		4.4	233	C	0.07	0.008	U	0.008	0.52	U	0.52	10.6		0.35	808		86.0	1.0	U	1.0
FS-3	J169W9	2/13/08	3990	C	6.9	274	C	0.11	0.01	U	0.01	1.1		0.82	9.3		0.55	973		135	1.6	U	1.6
FS-4	J169X0	2/13/08	3740	C	7.1	272	C	0.11	0.01	U	0.01	0.86	U	0.86	9.5		0.57	1040		140	1.7	U	1.7
FS-5	J169X1	2/13/08	3470	C	6.2	273	C	0.10	0.008	U	0.008	0.97		0.75	9.0		0.50	908		123	1.5	U	1.5
FS-1	J16945	2/13/08	3320	C	6.4	214	C	0.10	0.03		0.01	0.77	U	0.77	8.3		0.51	875		126	1.5	U	1.5
FS-2	J16946	2/13/08	3910	C	5.6	203	C	0.09	0.04		0.009	0.86		0.68	9.4		0.45	1220		222	1.4	U	1.4
Equip. blank	J16933	2/14/08	12.6		2.1	20.8		0.03	0.009	U	0.009	0.26	U	0.26	0.17	U	0.17	26.1		3.4	0.51	U	0.51
SZ-1	J16934	2/14/08	3470		6.3	239		0.10	0.04		0.01	0.76	U	0.76	9.0		0.51	786		10.2	1.5	U	1.5
SZ-2	J16935	2/14/08	3660		6.5	248		0.10	0.02		0.009	0.78	U	0.78	9.9		0.52	730		10.4	1.6	U	1.6
SZ-3	J16936	2/14/08	3350		6.8	242		0.11	0.02		0.009	0.81	U	0.81	9.0		0.54	651		10.8	1.6	U	1.6
SZ-4	J16937	2/14/08	3500		7.4	201		0.12	0.15		0.009	0.89	U	0.89	9.2		0.59	668		11.8	1.8	U	1.8
SZ-5	J16938	2/14/08	3140		5.8	208		0.09	0.03		0.008	0.70	U	0.70	8.8		0.47	607		9.3	1.4	U	1.4
SZ-6	J16939	2/14/08	3550		7.6	242		0.12	0.01	U	0.01	0.91	U	0.91	8.7		0.61	918		12.1	1.8	U	1.8
SZ-7	J16940	2/14/08	3710		7.0	284		0.11	0.01	U	0.01	0.84	U	0.84	10.6		0.56	881		11.1	1.7	U	1.7
SZ-8	J16941	2/14/08	3790		6.4	277		0.10	0.009	U	0.009	0.77	U	0.77	9.9		0.52	861		10.3	1.5	U	1.5
SZ-9	J16942	2/14/08	4150		7.0	335		0.11	0.02		0.009	0.85	U	0.85	10.9		0.56	886		11.3	1.7	U	1.7
SZ-10	J16943	2/14/08	3490		7.1	317		0.11	0.01		0.009	0.85	U	0.85	9.5		0.57	1290		11.3	1.7	U	1.7
Dup. of SZ-10	J16944	2/14/08	3920		7.6	321		0.12	0.34		0.01	0.91	U	0.91	10.7		0.61	1160		12.1	1.8	U	1.8
OB-1	J16M53	4/10/08	5410		7.1	254		0.11	0.03		0.009	1.1		0.85	13.2		0.57	819		11.3	1.7	U	1.7

Table B-5. 100-F-26:9 Inorganic Verification Data Results. (4 Pages)

Sample Location	HEIS Number	Sample Date	Silicon			Silver			Sodium			Vanadium			Zinc			Total Petroleum Hydrocarbons		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
RC-1	J14JT0	2/14/07	541	C	1.9	0.15	U	0.15	96.6	C	0.75	32.9		0.18	77.6	C	0.12	143	U	143
RB-1	J14JT1	2/14/07	706	C	1.9	0.15	U	0.15	106	C	0.74	27.9		0.18	29	C	0.12	143	U	143
RB-2	J14JT2	2/14/07	481	C	1.9	0.15	U	0.15	101	C	0.74	36.2		0.18	31.1	C	0.12	139	U	139
Inprocess	J14JT7	2/14/07	517	C	2	0.2	C	0.16	623		0.8	44.9		0.19	36.5	C	0.13	151	U	151
RC-2	J14JT3	2/14/07	532	C	1.9	0.15	UC	0.15	65		7.4	39.4		0.18	33	C	0.12	139	U	139
RC-3	J14JT4	2/20/07	429	C	3.2	0.28		0.15	77.6	C	0.73	21.8		0.18	24.7	C	0.64	135	U	135
RC-4	J13W57	2/21/07	431	C	1.8	0.27	U	0.27	98.5	C	9	34.4		0.30	31.9	C	0.09	141	U	141
RB-3	J14JT5	2/21/07	373	C	1.8	0.27	U	0.27	91	C	9.0	24.9		0.30	25.2	C	0.09	141	U	141
Inprocess	J15W94	10/23/07	2710		11.1	0.28	U	0.28	151	C	5.6	35.2		0.39	34.5	C	1.7			
Inprocess	J15W95	10/23/07	1730		11.6	0.29	U	0.29	207	C	5.8	40.5		0.41	39.7	C	1.7			
OB-1	J16947	2/6/08	2300		11.8	0.30	U	0.30	228	C	5.9	36.7		0.41	49.3		1.8	4930	D	714
OB-2	J16948	2/6/08	2540		13.3	0.33	U	0.33	226	C	6.7	35.2		0.47	31.0		2.0	174	U	174
OB-3	J16949	2/6/08	3390		12.2	0.31	U	0.31	196	C	6.1	21.3		0.43	28.0		1.8	162	U	162
OB-4	J16950	2/6/08	2600		12.6	0.32	U	0.32	148	C	6.3	30.0		0.44	28.0		1.9	156	U	156
OB-5	J16951	2/11/08	2840		12.3	0.31	U	0.31	216	C	6.2	37.7		0.43	35.5		1.9	141	U	141
OB-6	J16952	2/11/08	3290		11.3	0.28	U	0.28	229	C	5.7	40.3		0.40	37.6		1.7	142	U	142
OB-7	J16953	2/11/08	2490		11.5	0.29	U	0.29	194	C	5.8	33.9		0.40	73.9		1.7	138	U	138
OB-8	J16954	2/11/08	2820		11.5	0.29	U	0.29	207	C	5.8	36.4		0.40	42.7		1.7	142	U	142
OB-9	J16955	2/11/08	4000		12.3	0.31	U	0.31	223	C	6.2	41.2		0.43	36.8		1.9	146	U	146
OB-10	J16956	2/11/08	1650		11.8	0.30	U	0.30	634	C	5.9	44.7		0.41	47.9		1.8	148	U	148
OB-11	J16957	2/11/08	1550		11.6	0.29	U	0.29	151	C	5.8	40.6		0.41	34.2		1.7	140	U	140
OB-12	J16958	2/11/08	3030		12.7	0.32	U	0.32	246	C	6.3	44.2		0.44	33.3		1.9	141	U	141
OB-13	J16959	2/11/08	2770		12.8	0.32	U	0.32	170	C	6.4	37.9		0.45	33.3		1.9	147	U	147
OB-14	J16960	2/11/08	2360		11.7	0.28	U	0.28	323	C	5.5	37.5		0.39	40.8		1.7	145	U	145
SP-1	J16961	2/12/08	220		10.7	0.27	U	0.27	119	C	5.4	26.4		0.38	32.4	C	1.6	147	U	147
SP-2	J16962	2/12/08	207		9.8	0.25	U	0.25	122	C	4.9	28.2		0.34	30.9	C	1.5	145	U	145
SP-3	J16963	2/12/08	196		10.0	0.25	U	0.25	149	C	5.0	29.4		0.35	37.4	C	1.5	143	U	143
SP-4	J16964	2/12/08	209		9.9	0.25	U	0.25	115	C	5.0	25.2		0.35	32.3	C	1.5	145	U	145
SP-5	J16965	2/12/08	189		10.5	0.26	U	0.26	143	C	5.2	33.1		0.37	38.3	C	1.6	149	U	149
SP-6	J16966	2/12/08	242		9.7	0.24	U	0.24	223	C	4.8	29.5		0.34	38.4	C	1.5	418		154
SP-7	J16967	2/12/08	193		11.4	0.28	U	0.28	131	C	5.7	33.7		0.40	35.7	C	1.7	150	U	150
SP-8	J16968	2/12/08	259		8.9	0.22	U	0.22	119	C	4.5	27.1		0.31	32.8	C	1.3	152	U	152
SP-9	J16969	2/12/08	279		11.5	0.29	U	0.29	118	C	5.8	28.1		0.40	38.0	C	1.7	153	U	153
SP-10	J16970	2/12/08	213		10.5	0.26	U	0.26	121	C	5.2	28.8		0.37	30.7	C	1.6	146	U	146
Dup. of SP-10	J16971	2/12/08	117		7.0	0.17	U	0.17	116	C	3.5	29.8		0.24	30.7	C	1.0	149	U	149
FS-3	J169W9	2/13/08	249	J	11.0	0.27	U	0.27	284	C	5.5	42.3		0.38	33.1		1.6	138	U	138
FS-4	J169X0	2/13/08	265	J	11.4	0.28	U	0.28	158	C	5.7	39.8		0.40	33.8		1.7	142	U	142
FS-5	J169X1	2/13/08	236	J	10.0	0.25	U	0.25	148	C	5.0	37.0		0.35	32.0		1.5	140	U	140
FS-1	J16945	2/13/08	221	J	10.2	1.2		0.26	117	C	5.1	33.9		0.36	36.0		1.5	149	U	149
FS-2	J16946	2/13/08	288	J	9.0	0.22	U	0.22	980	C	9.0	30.1		0.32	42.3		1.4	142	U	142
Equip. blank	J16933	2/14/08	51.4		3.4	0.09	U	0.09	10.9		1.7	0.22		0.12	2.5		0.51			
SZ-1	J16934	2/14/08	316		10.2	0.25	U	0.25	115		1.7	38.0		0.36	42.9		1.5	138	U	138
SZ-2	J16935	2/14/08	282		10.4	0.26	U	0.26	121		1.7	37.9		0.36	49.3		1.6	137	U	137
SZ-3	J16936	2/14/08	407		10.8	0.27	U	0.27	123		1.8	37.4		0.38	41.2		1.6	141	U	141
SZ-4	J16937	2/14/08	382		11.8	0.30	U	0.30	116		2.0	32.6		0.41	45.7		1.8	148	U	148
SZ-5	J16938	2/14/08	384		9.3	0.23	U	0.23	94.7		1.6	29.2		0.33	28.9		1.4	140	U	140
SZ-6	J16939	2/14/08	488		12.1	0.30	U	0.30	162		2.0	39.9		0.42	34.6		1.8	143	U	143
SZ-7	J16940	2/14/08	337		11.1	0.28	U	0.28	118		1.9	48.1		0.39	36.9		1.7	140	U	140
SZ-8	J16941	2/14/08	344		10.3	0.26	U	0.26	120		1.7	47.5		0.36	36.3		1.5	144	U	144
SZ-9	J16942	2/14/08	479		11.3	0.28	U	0.28	406		1.9	37.5		0.39	38.0		1.7	144	U	144
SZ-10	J16943	2/14/08	322		11.3	0.28	U	0.28	142		1.9	37.4		0.40	37.2		1.7	155	U	155
Dup. of SZ-10	J16944	2/14/08	280		12.1	0.30	U	0.30	172		2.0	45.7		0.42	54.4		1.8	155	U	155
OB-1	J16M53	4/10/08	470		11.3	0.28	U	0.28	740		5.7	49.3		0.40	85.8		1.7	149	U	149

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J14JT0 Sample RC-1 Sample Date 2/14/07			J14JT1 Sample RB-1 Sample Date 2/14/07			J14JT2 Sample RB-2 Sample Date 2/14/07			J14JT3 Sample RC-2 Sample Date 2/14/07			J14JT4 Sample RC-3 Sample Date 2/14/07			J13W57 Sample RC-4 Sample Date 2/21/07			J14JT5 Sample RB-3 Sample Date 2/21/07		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Polychlorinated Byphenyls (PCBs)																					
Aroclor-1016	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1221	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1232	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1242	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1248	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1254	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1260	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
Pesticides																					
Aldrin																					
Alpha-BHC																					
alpha-Chlordane																					
beta-1,2,3,4,5,6-Hexachlorocyclohexane																					
Delta-BHC																					
Dichlorodiphenyldi-chloroethane																					
Dichlorodiphenyldi-chloroethylene																					
Dichlorodiphenyltri-chloroethane																					
Dieldrin																					
Endosulfan I																					
Endosulfan II																					
Endosulfan sulfate																					
Endrin																					
Endrin aldehyde																					
Endrin ketone																					
Gamma-BHC (Lindane)																					
gamma-Chlordane																					
Heptachlor																					
Heptachlor epoxide																					
Methoxychlor																					
Toxaphene																					

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J14JT0 Sample RC-1 Sample Date 2/14/07			J14JT1 Sample RB-1 Sample Date 2/14/07			J14JT2 Sample RB-2 Sample Date 2/14/07			J14JT3 Sample RC-2 Sample Date 2/14/07			J14JT4 Sample RC-3 Sample Date 2/14/07			J13W57 Sample RC-4 Sample Date 2/21/07			J14JT5 Sample RB-3 Sample Date 2/21/07		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organics (SVOAs)																					
1,2,4-Trichlorobenzene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
1,2-Dichlorobenzene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
1,3-Dichlorobenzene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
1,4-Dichlorobenzene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
2,4,5-Trichlorophenol	900	U	900	890	U	890	870	U	870	870	U	870	850	U	850	880	U	880	880	U	880
2,4,6-Trichlorophenol	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
2,4-Dichlorophenol	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
2,4-Dimethylphenol	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
2,4-Dinitrophenol	900	U	900	890	U	890	870	U	870	870	U	870	850	U	850	880	U	880	880	U	880
2,4-Dinitrotoluene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
2,6-Dinitrotoluene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
2-Chloronaphthalene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
2-Chlorophenol	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
2-Methylnaphthalene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
2-Methylphenol (cresol, o-)	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
2-Nitroaniline	900	U	900	890	U	890	870	U	870	870	U	870	850	U	850	880	U	880	880	U	880
2-Nitrophenol	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
3+4 Methylphenol (cresol, m+p)	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
3,3'-Dichlorobenzidine	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
3-Nitroaniline	900	U	900	890	U	890	870	U	870	870	U	870	850	U	850	880	U	880	880	U	880
4,6-Dinitro-2- methylphenol	900	U	900	890	U	890	870	U	870	870	U	870	850	U	850	880	U	880	880	U	880
4-Bromophenylphenyl ether	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
4-Chloro-3-methylphenol	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
4-Chloroaniline	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
4-Chlorophenylphenyl ether	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
4-Nitroaniline	900	U	900	890	U	890	870	U	870	870	U	870	850	U	850	880	U	880	880	U	880
4-Nitrophenol	900	U	900	890	U	890	870	U	870	870	U	870	850	U	850	880	U	880	880	U	880
Acenaphthene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Acenaphthylene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Anthracene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Benzo(a)anthracene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Benzo(a)pyrene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Benzo(b)fluoranthene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J14JT0 Sample RC-1 Sample Date 2/14/07			J14JT1 Sample RB-1 Sample Date 2/14/07			J14JT2 Sample RB-2 Sample Date 2/14/07			J14JT3 Sample RC-2 Sample Date 2/14/07			J14JT4 Sample RC-3 Sample Date 2/14/07			J13W57 Sample RC-4 Sample Date 2/21/07			J14JT5 Sample RB-3 Sample Date 2/21/07		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs (continued)																					
Benzo(ghi)perylene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Benzo(k)fluoranthene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Bis(2-chloro-1-methylethyl)ether	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Bis(2-Chloroethoxy)methane	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Bis(2-chloroethyl) ether	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Bis(2-ethylhexyl) phthalate	130	JB	360	450	B	360	270	JB	350	27	JB	350	220	JB	340	350	U	350	28	JB	350
Butylbenzylphthalate	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Carbazole	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Chrysene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Di-n-butylphthalate	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Di-n-octylphthalate	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Dibenz[a,h]anthracene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Dibenzofuran	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Diethylphthalate	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Dimethyl phthalate	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Fluoranthene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Fluorene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Hexachlorobenzene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Hexachlorobutadiene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Hexachlorocyclopentadiene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Hexachloroethane	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Indeno(1,2,3-cd)pyrene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Isophorone	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
N-Nitroso-di-n-dipropylamine	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
N-Nitrosodiphenylamine	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Naphthalene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Nitrobenzene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Pentachlorophenol	900	U	900	890	U	890	870	U	870	870	U	870	850	U	850	880	U	880	880	U	880
Phenanthrene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Phenol	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350
Pyrene	360	U	360	360	U	360	350	U	350	350	U	350	340	U	340	350	U	350	350	U	350

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J15W94 Inprocess Sample Sample Date 10/23/07			J15W95 Inprocess Sample Sample Date 10/23/07			J16947 Sample OB-1 Sample Date 2/6/08			J16948 Sample OB-2 Sample Date 2/6/08			J16949 Sample OB-3 Sample Date 2/6/08			J16950 Sample OB-4 Sample Date 2/6/08			J16951 Sample OB-5 Sample Date 2/11/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Polychlorinated Byphenyls (PCBs)																					
Aroclor-1016							14	U	14	17	U	17	16	U	16	16	U	16	14	U	14
Aroclor-1221							14	U	14	17	U	17	16	U	16	16	U	16	14	U	14
Aroclor-1232							14	U	14	17	U	17	16	U	16	16	U	16	14	U	14
Aroclor-1242							14	U	14	17	U	17	16	U	16	16	U	16	14	U	14
Aroclor-1248							14	U	14	17	U	17	16	U	16	16	U	16	14	U	14
Aroclor-1254							45		14	17	U	17	16	U	16	16	U	16	14	U	14
Aroclor-1260							41		14	17	U	17	16	U	16	16	U	16	14	U	14
Pesticides																					
Aldrin																					
Alpha-BHC																					
alpha-Chlordane																					
beta-1,2,3,4,5,6-Hexachlorocyclohexane																					
Delta-BHC																					
Dichlorodiphenyldi-chloroethane																					
Dichlorodiphenyldi-chloroethylene																					
Dichlorodiphenyltri-chloroethane																					
Dieldrin																					
Endosulfan I																					
Endosulfan II																					
Endosulfan sulfate																					
Endrin																					
Endrin aldehyde																					
Endrin ketone																					
Gamma-BHC (Lindane)																					
gamma-Chlordane																					
Heptachlor																					
Heptachlor epoxide																					
Methoxychlor																					
Toxaphene																					

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J15W94 Inprocess Sample Sample Date 10/23/07			J15W95 Inprocess Sample Sample Date 10/23/07			J16947 Sample OB-1 Sample Date 2/6/08			J16948 Sample OB-2 Sample Date 2/6/08			J16949 Sample OB-3 Sample Date 2/6/08			J16950 Sample OB-4 Sample Date 2/6/08			J16951 Sample OB-5 Sample Date 2/11/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
	Semivolatile Organics (SVOAs)																				
1,2,4-Trichlorobenzene	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
1,2-Dichlorobenzene	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
1,3-Dichlorobenzene	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
1,4-Dichlorobenzene	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
2,4,5-Trichlorophenol	1000	U	1000	990	U	990	900	U	900	1100	U	1100	1000	U	1000	980	U	980	7100	UD	7100
2,4,6-Trichlorophenol	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
2,4-Dichlorophenol	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
2,4-Dimethylphenol	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
2,4-Dinitrophenol	1000	U	1000	990	U	990	900	U	900	1100	U	1100	1000	U	1000	980	U	980	7100	UD	7100
2,4-Dinitrotoluene	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
2,6-Dinitrotoluene	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
2-Chloronaphthalene	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
2-Chlorophenol	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
2-Methylnaphthalene	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
2-Methylphenol (cresol, o-)	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
2-Nitroaniline	1000	U	1000	990	U	990	900	U	900	1100	U	1100	1000	U	1000	980	U	980	7100	UD	7100
2-Nitrophenol	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
3+4 Methylphenol (cresol, m+p)	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
3,3'-Dichlorobenzidine	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
3-Nitroaniline	1000	U	1000	990	U	990	900	U	900	1100	U	1100	1000	U	1000	980	U	980	7100	UD	7100
4,6-Dinitro-2- methylphenol	1000	U	1000	990	U	990	900	U	900	1100	U	1100	1000	U	1000	980	U	980	7100	UD	7100
4-Bromophenylphenyl ether	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
4-Chloro-3-methylphenol	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
4-Chloroaniline	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
4-Chlorophenylphenyl ether	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
4-Nitroaniline	1000	U	1000	990	U	990	900	U	900	1100	U	1100	1000	U	1000	980	U	980	7100	UD	7100
4-Nitrophenol	1000	U	1000	990	U	990	900	U	900	1100	U	1100	1000	U	1000	980	U	980	7100	UD	7100
Acenaphthene	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Acenaphthylene	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Anthracene	40	J	410	53	J	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Benzo(a)anthracene	200	J	410	200	J	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Benzo(a)pyrene	190	J	410	180	J	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Benzo(b)fluoranthene	230	J	410	220	J	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J15W94 Inprocess Sample Sample Date 10/23/07			J15W95 Inprocess Sample Sample Date 10/23/07			J16947 Sample OB-1 Sample Date 2/6/08			J16948 Sample OB-2 Sample Date 2/6/08			J16949 Sample OB-3 Sample Date 2/6/08			J16950 Sample OB-4 Sample Date 2/6/08			J16951 Sample OB-5 Sample Date 2/11/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs (continued)																					
Benzo(ghi)perylene	110	J	410	110	J	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Benzo(k)fluoranthene	190	J	410	230	J	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Bis(2-chloro-1-methylethyl)ether	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Bis(2-Chloroethoxy)methane	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Bis(2-chloroethyl) ether	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Bis(2-ethylhexyl) phthalate	44	JB	410	55	JB	390	110	JB	360	42	JB	440	65	JB	410	82	JB	390	490	JB D	2900
Butylbenzylphthalate	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Carbazole	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Chrysene	270	J	410	270	J	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Di-n-butylphthalate	26	JB	410	23	JB	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Di-n-octylphthalate	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Dibenz[a,h]anthracene	58	J	410	58	J	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Dibenzofuran	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Diethylphthalate	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Dimethyl phthalate	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Fluoranthene	580		410	520		390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Fluorene	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Hexachlorobenzene	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Hexachlorobutadiene	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Hexachlorocyclopentadiene	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Hexachloroethane	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Indeno(1,2,3-cd)pyrene	120	J	410	120	J	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Isophorone	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
N-Nitroso-di-n-dipropylamine	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
N-Nitrosodiphenylamine	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Naphthalene	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Nitrobenzene	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Pentachlorophenol	1000	U	1000	990	U	990	900	U	900	1100	U	1100	1000	U	1000	980	U	980	7100	UD	7100
Phenanthrene	300	J	410	332	J	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Phenol	410	U	410	390	U	390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900
Pyrene	400	J	410	420		390	360	U	360	440	U	440	410	U	410	390	U	390	2900	UD	2900

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J16952 Sample OB-6 Sample Date 2/11/08			J16953 Sample OB-7 Sample Date 2/11/08			J16954 Sample OB-8 Sample Date 2/11/08			J16955 Sample OB-9 Sample Date 2/11/08			J16956 Sample OB-10 Sample Date 2/11/08			J16957 Sample OB-11 Sample Date 2/11/08			J16958 Sample OB-12 Sample Date 2/11/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Polychlorinated Biphenyls (PCBs)																					
Aroclor-1016	14	U	14	14	U	14	14	U	14	15	U	15	15	U	15	14	U	14	14	U	14
Aroclor-1221	14	U	14	14	U	14	14	U	14	15	U	15	15	U	15	14	U	14	14	U	14
Aroclor-1232	14	U	14	14	U	14	14	U	14	15	U	15	15	U	15	14	U	14	14	U	14
Aroclor-1242	14	U	14	14	U	14	14	U	14	15	U	15	15	U	15	14	U	14	14	U	14
Aroclor-1248	14	U	14	14	U	14	14	U	14	15	U	15	15	U	15	14	U	14	14	U	14
Aroclor-1254	14	U	14	14	U	14	14	U	14	15	U	15	15	U	15	14	U	14	14	U	14
Aroclor-1260	14	U	14	14	U	14	14	U	14	15	U	15	24		15	14	U	14	14	U	14
Pesticides																					
Aldrin																					
Alpha-BHC																					
alpha-Chlordane																					
beta-1,2,3,4,5,6-Hexachlorocyclohexane																					
Delta-BHC																					
Dichlorodiphenyldi-chloroethane																					
Dichlorodiphenyldi-chloroethylene																					
Dichlorodiphenyltri-chloroethane																					
Dieldrin																					
Endosulfan I																					
Endosulfan II																					
Endosulfan sulfate																					
Endrin																					
Endrin aldehyde																					
Endrin ketone																					
Gamma-BHC (Lindane)																					
gamma-Chlordane																					
Heptachlor																					
Heptachlor epoxide																					
Methoxychlor																					
Toxaphene																					

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J16952 Sample OB-6 Sample Date 2/11/08			J16953 Sample OB-7 Sample Date 2/11/08			J16954 Sample OB-8 Sample Date 2/11/08			J16955 Sample OB-9 Sample Date 2/11/08			J16956 Sample OB-10 Sample Date 2/11/08			J16957 Sample OB-11 Sample Date 2/11/08			J16958 Sample OB-12 Sample Date 2/11/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organics (SVOAs)																					
1,2,4-Trichlorobenzene	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
1,2-Dichlorobenzene	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
1,3-Dichlorobenzene	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
1,4-Dichlorobenzene	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
2,4,5-Trichlorophenol	900	U	900	870	U	870	890	U	890	920	U	920	930	U	930	880	U	880	890	U	890
2,4,6-Trichlorophenol	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
2,4-Dichlorophenol	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
2,4-Dimethylphenol	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
2,4-Dinitrophenol	900	U	900	870	U	870	890	U	890	920	U	920	930	U	930	880	U	880	890	U	890
2,4-Dinitrotoluene	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
2,6-Dinitrotoluene	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
2-Chloronaphthalene	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
2-Chlorophenol	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
2-Methylnaphthalene	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
2-Methylphenol (cresol, o-)	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
2-Nitroaniline	900	U	900	870	U	870	890	U	890	920	U	920	930	U	930	880	U	880	890	U	890
2-Nitrophenol	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
3+4 Methylphenol (cresol, m+p)	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
3,3'-Dichlorobenzidine	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
3-Nitroaniline	900	U	900	870	U	870	890	U	890	920	U	920	930	U	930	880	U	880	890	U	890
4,6-Dinitro-2- methylphenol	900	U	900	870	U	870	890	U	890	920	U	920	930	U	930	880	U	880	890	U	890
4-Bromophenylphenyl ether	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
4-Chloro-3-methylphenol	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
4-Chloroaniline	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
4-Chlorophenylphenyl ether	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
4-Nitroaniline	900	U	900	870	U	870	890	U	890	920	U	920	930	U	930	880	U	880	890	U	890
4-Nitrophenol	900	U	900	870	U	870	890	U	890	920	U	920	930	U	930	880	U	880	890	U	890
Acenaphthene	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Acenaphthylene	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Anthracene	360	U	360	22	J	350	360	U	360	370	U	370	370	U	370	19	J	350	360	U	360
Benzo(a)anthracene	360	U	360	100	J	350	37	J	360	370	U	370	370	U	370	95	J	350	360	U	360
Benzo(a)pyrene	360	U	360	92	J	350	36	J	360	370	U	370	370	U	370	110	J	350	360	U	360
Benzo(b)fluoranthene	360	U	360	79	J	350	27	J	360	370	U	370	370	U	370	89	J	350	360	U	360

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J16952 Sample OB-6 Sample Date 2/11/08			J16953 Sample OB-7 Sample Date 2/11/08			J16954 Sample OB-8 Sample Date 2/11/08			J16955 Sample OB-9 Sample Date 2/11/08			J16956 Sample OB-10 Sample Date 2/11/08			J16957 Sample OB-11 Sample Date 2/11/08			J16958 Sample OB-12 Sample Date 2/11/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs (continued)																					
Benzo(ghi)perylene	360	U	360	63	J	350	27	J	360	370	U	370	370	U	370	70	J	350	360	U	360
Benzo(k)fluoranthene	360	U	360	97	J	350	43	J	360	370	U	370	370	U	370	90	J	350	360	U	360
Bis(2-chloro-1-methylethyl)ether	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Bis(2-Chloroethoxy)methane	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Bis(2-chloroethyl) ether	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Bis(2-ethylhexyl) phthalate	240	JB	360	140	JB	350	140	JB	360	130	JB	370	220	JB	370	110	JB	350	110	JB	110
Butylbenzylphthalate	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Carbazole	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Chrysene	360	U	360	140	J	350	48	J	360	370	U	370	370	U	370	130	J	350	360	U	360
Di-n-butylphthalate	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Di-n-octylphthalate	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Dibenz[a,h]anthracene	360	U	360	19	J	350	360	U	360	370	U	370	370	U	370	22	J	350	360	U	360
Dibenzofuran	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Diethylphthalate	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Dimethyl phthalate	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Fluoranthene	360	U	360	200	J	350	73	J	360	370	U	370	370	U	370	220	J	350	360	U	360
Fluorene	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Hexachlorobenzene	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Hexachlorobutadiene	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Hexachlorocyclopentadiene	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Hexachloroethane	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Indeno(1,2,3-cd)pyrene	360	U	360	55	J	350	30	J	360	370	U	370	370	U	370	71	J	350	360	U	360
Isophorone	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
N-Nitroso-di-n-dipropylamine	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
N-Nitrosodiphenylamine	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Naphthalene	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Nitrobenzene	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Pentachlorophenol	900	U	900	870	U	870	890	U	890	920	U	920	930	U	930	880	U	880	890	U	890
Phenanthrene	360	U	360	100	J	350	40	J	360	370	U	370	370	U	370	110	J	350	360	U	360
Phenol	360	U	360	350	U	350	360	U	360	370	U	370	370	U	370	350	U	350	360	U	360
Pyrene	360	U	360	250	J	350	91	J	360	370	U	370	370	U	370	260	J	350	360	U	360

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J16959 Sample OB-13 Sample Date 2/11/08			J16960 Sample OB-14 Sample Date 2/11/08			J16961 Sample SP-1 Sample Date 2/12/08			J16962 Sample SP-2 Sample Date 2/12/08			J16963 Sample SP-3 Sample Date 2/12/08			J16964 Sample SP-4 Sample Date 2/12/08			J16965 Sample SP-5 Sample Date 2/12/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
	Polychlorinated Byphenyls (PCBs)																				
Aroclor-1016	15	U	15	15	U	15	15	U	15	15	U	15	14	U	14	15	U	15	15	U	15
Aroclor-1221	15	U	15	15	U	15	15	U	15	15	U	15	14	U	14	15	U	15	15	U	15
Aroclor-1232	15	U	15	15	U	15	15	U	15	15	U	15	14	U	14	15	U	15	15	U	15
Aroclor-1242	15	U	15	15	U	15	15	U	15	15	U	15	14	U	14	15	U	15	15	U	15
Aroclor-1248	15	U	15	15	U	15	15	U	15	15	U	15	14	U	14	15	U	15	15	U	15
Aroclor-1254	15	U	15	15	U	15	15	U	15	15	U	15	14	U	14	15	U	15	15	U	15
Aroclor-1260	15	U	15	180		15	15	U	15	15	U	15	14	U	14	15	U	15	15	U	15
Pesticides																					
Aldrin							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
Alpha-BHC							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
alpha-Chlordane							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
beta-1,2,3,4,5,6-Hexachlorocyclohexane							1.5	UD	1.5	1.5	UD	1.5	3.9	JD	3.9	1.5	UD	1.5	1.5	UD	1.5
Delta-BHC							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
Dichlorodiphenyldi-chloroethane							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
Dichlorodiphenyldi-chloroethylene							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
Dichlorodiphenyltri-chloroethane							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
Dieldrin							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
Endosulfan I							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
Endosulfan II							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
Endosulfan sulfate							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
Endrin							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
Endrin aldehyde							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
Endrin ketone							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
Gamma-BHC (Lindane)							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
gamma-Chlordane							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
Heptachlor							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
Heptachlor epoxide							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
Methoxychlor							1.5	UD	1.5	1.5	UD	1.5	1.4	UD	1.4	1.5	UD	1.5	1.5	UD	1.5
Toxaphene							15	UD	15	15	UD	15	14	UD	14	15	UD	15	15	UD	15

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J16959 Sample OB-13 Sample Date 2/11/08			J16960 Sample OB-14 Sample Date 2/11/08			J16961 Sample SP-1 Sample Date 2/12/08			J16962 Sample SP-2 Sample Date 2/12/08			J16963 Sample SP-3 Sample Date 2/12/08			J16964 Sample SP-4 Sample Date 2/12/08			J16965 Sample SP-5 Sample Date 2/12/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organics (SVOAs)																					
1,2,4-Trichlorobenzene	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
1,2-Dichlorobenzene	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
1,3-Dichlorobenzene	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
1,4-Dichlorobenzene	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
2,4,5-Trichlorophenol	930	U	930	910	U	910	920	U	920	910	U	910	900	U	900	910	U	910	930	U	930
2,4,6-Trichlorophenol	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
2,4-Dichlorophenol	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
2,4-Dimethylphenol	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
2,4-Dinitrophenol	930	U	930	910	U	910	920	U	920	910	U	910	900	U	900	910	U	910	930	U	930
2,4-Dinitrotoluene	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
2,6-Dinitrotoluene	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
2-Chloronaphthalene	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
2-Chlorophenol	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
2-Methylnaphthalene	370	U	370	27	J	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
2-Methylphenol (cresol, o-)	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
2-Nitroaniline	930	U	930	910	U	910	920	U	920	910	U	910	900	U	900	910	U	910	930	U	930
2-Nitrophenol	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
3+4 Methylphenol (cresol, m+p)	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
3,3'-Dichlorobenzidine	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
3-Nitroaniline	930	U	930	910	U	910	920	U	920	910	U	910	900	U	900	910	U	910	930	U	930
4,6-Dinitro-2- methylphenol	930	U	930	910	U	910	920	U	920	910	U	910	900	U	900	910	U	910	930	U	930
4-Bromophenylphenyl ether	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
4-Chloro-3-methylphenol	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
4-Chloroaniline	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
4-Chlorophenylphenyl ether	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
4-Nitroaniline	930	U	930	910	U	910	920	U	920	910	U	910	900	U	900	910	U	910	930	U	930
4-Nitrophenol	930	U	930	910	U	910	920	U	920	910	U	910	900	U	900	910	U	910	930	U	930
Acenaphthene	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Acenaphthylene	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Anthracene	370	U	370	360	U	360	370	U	370	360	U	360	26	J	360	360	U	360	370	U	370
Benzo(a)anthracene	370	U	370	360	U	360	370	U	370	360	U	360	120	J	360	21	J	360	370	U	370
Benzo(a)pyrene	370	U	370	360	U	360	370	U	370	360	U	360	140	J	360	360	U	360	370	U	370
Benzo(b)fluoranthene	370	U	370	360	U	360	370	U	370	360	U	360	75	J	360	360	U	360	370	U	370

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J16959 Sample OB-13 Sample Date 2/11/08			J16960 Sample OB-14 Sample Date 2/11/08			J16961 Sample SP-1 Sample Date 2/12/08			J16962 Sample SP-2 Sample Date 2/12/08			J16963 Sample SP-3 Sample Date 2/12/08			J16964 Sample SP-4 Sample Date 2/12/08			J16965 Sample SP-5 Sample Date 2/12/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
	SVOAs (continued)																				
Benzo(ghi)perylene	370	U	370	360	U	360	370	U	370	360	U	360	87	J	360	360	U	360	370	U	370
Benzo(k)fluoranthene	370	U	370	360	U	360	370	U	370	360	U	360	120	J	360	360	U	360	370	U	370
Bis(2-chloro-1-methylethyl)ether	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Bis(2-Chloroethoxy)methane	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Bis(2-chloroethyl) ether	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Bis(2-ethylhexyl) phthalate	260	JB	370	330	JB	360	510	B	370	59	JB	360	61	JB	360	110	JB	360	110	JB	370
Butylbenzylphthalate	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Carbazole	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Chrysene	370	U	370	360	U	360	370	U	370	360	U	360	160	J	360	25	J	360	370	U	370
Di-n-butylphthalate	370	U	370	360	U	360	370	U	370	22	J	360	360	U	360	360	U	360	370	U	370
Di-n-octylphthalate	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Dibenz[a,h]anthracene	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Dibenzofuran	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Diethylphthalate	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Dimethyl phthalate	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Fluoranthene	370	U	370	360	U	360	370	U	370	360	U	360	200	J	360	28	J	360	370	U	370
Fluorene	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Hexachlorobenzene	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Hexachlorobutadiene	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Hexachlorocyclopentadiene	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Hexachloroethane	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Indeno(1,2,3-cd)pyrene	370	U	370	360	U	360	370	U	370	360	U	360	83	J	360	360	U	360	370	U	370
Isophorone	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
N-Nitroso-di-n-dipropylamine	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
N-Nitrosodiphenylamine	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Naphthalene	370	U	370	18	J	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Nitrobenzene	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Pentachlorophenol	930	U	930	910	U	910	920	U	920	910	U	910	900	U	900	910	U	910	930	U	930
Phenanthrene	370	U	370	360	U	360	370	U	370	360	U	360	150	J	360	22	J	360	370	U	370
Phenol	370	U	370	360	U	360	370	U	370	360	U	360	360	U	360	360	U	360	370	U	370
Pyrene	370	U	370	360	U	360	370	U	370	360	U	360	260	J	360	42	J	360	370	U	370

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J16966 Sample SP-6 Sample Date 2/12/08			J16967 Sample SP-7 Sample Date 2/12/08			J16968 Sample SP-8 Sample Date 2/12/08			J16969 Sample SP-9 Sample Date 2/12/08			J16970 Sample SP-10 Sample Date 2/12/08			J16971 Duplicate of SP-10 Sample Date 2/12/08			J169W9 Sample FS-3 Sample Date 2/13/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
	Polychlorinated Biphenyls (PCBs)																				
Aroclor-1016	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	14	U	14
Aroclor-1221	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	14	U	14
Aroclor-1232	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	14	U	14
Aroclor-1242	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	14	U	14
Aroclor-1248	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	14	U	14
Aroclor-1254	23	J	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	14	U	14
Aroclor-1260	19		15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	14	U	14
Pesticides																					
Aldrin	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5			
Alpha-BHC	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5			
alpha-Chlordane	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	2.7	JD	1.5	1.5	UD	1.5	1.5	UD	1.5			
beta-1,2,3,4,5,6-Hexachlorocyclohexane	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5			
Delta-BHC	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5			
Dichlorodiphenyldi-chloroethane	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5			
Dichlorodiphenyldi-chloroethylene	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	2.9	JD	1.5	1.5	UD	1.5	1.5	UD	1.5			
Dichlorodiphenyltri-chloroethane	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5			
Dieldrin	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5			
Endosulfan I	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5			
Endosulfan II	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5			
Endosulfan sulfate	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5			
Endrin	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5			
Endrin aldehyde	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5			
Endrin ketone	2.6	JD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5			
Gamma-BHC (Lindane)	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5			
gamma-Chlordane	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	2.6	JD	1.5	1.5	UD	1.5	1.5	UD	1.5			
Heptachlor	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5			
Heptachlor epoxide	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5			
Methoxychlor	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5			
Toxaphene	15	UD	15	15	UD	15	15	UD	15	15	UD	15	15	UD	15	15	UD	15			

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J16966 Sample SP-6 Sample Date 2/12/08			J16967 Sample SP-7 Sample Date 2/12/08			J16968 Sample SP-8 Sample Date 2/12/08			J16969 Sample SP-9 Sample Date 2/12/08			J16970 Sample SP-10 Sample Date 2/12/08			J16971 Duplicate of SP-10 Sample Date 2/12/08			J169W9 Sample FS-3 Sample Date 2/13/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organics (SVOAs)																					
1,2,4-Trichlorobenzene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
1,2-Dichlorobenzene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
1,3-Dichlorobenzene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
1,4-Dichlorobenzene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
2,4,5-Trichlorophenol	970	U	970	940	U	940	950	U	950	960	U	960	920	U	920	940	U	940	860	U	860
2,4,6-Trichlorophenol	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
2,4-Dichlorophenol	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
2,4-Dimethylphenol	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
2,4-Dinitrophenol	970	U	970	940	U	940	950	U	950	960	U	960	920	U	920	940	U	940	860	UJ	860
2,4-Dinitrotoluene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
2,6-Dinitrotoluene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
2-Chloronaphthalene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
2-Chlorophenol	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
2-Methylnaphthalene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
2-Methylphenol (cresol, o-)	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
2-Nitroaniline	970	U	970	940	U	940	950	U	950	960	U	960	920	U	920	940	U	940	860	U	860
2-Nitrophenol	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
3+4 Methylphenol (cresol, m+p)	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
3,3'-Dichlorobenzidine	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
3-Nitroaniline	970	U	970	940	U	940	950	U	950	960	U	960	920	U	920	940	U	940	860	UJ	860
4,6-Dinitro-2- methylphenol	970	U	970	940	U	940	950	U	950	960	U	960	920	U	920	940	U	940	860	UJ	860
4-Bromophenylphenyl ether	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
4-Chloro-3-methylphenol	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
4-Chloroaniline	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
4-Chlorophenylphenyl ether	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
4-Nitroaniline	970	U	970	940	U	940	950	U	950	960	U	960	920	U	920	940	U	940	860	U	860
4-Nitrophenol	970	U	970	940	U	940	950	U	950	960	U	960	920	U	920	940	U	940	860	U	860
Acenaphthene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Acenaphthylene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
Anthracene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Benzo(a)anthracene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Benzo(a)pyrene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Benzo(b)fluoranthene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J16966 Sample SP-6 Sample Date 2/12/08			J16967 Sample SP-7 Sample Date 2/12/08			J16968 Sample SP-8 Sample Date 2/12/08			J16969 Sample SP-9 Sample Date 2/12/08			J16970 Sample SP-10 Sample Date 2/12/08			J16971 Duplicate of SP-10 Sample Date 2/12/08			J169W9 Sample FS-3 Sample Date 2/13/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs (continued)																					
Benzo(ghi)perylene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Benzo(k)fluoranthene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Bis(2-chloro-1-methylethyl)ether	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Bis(2-Chloroethoxy)methane	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
Bis(2-chloroethyl) ether	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
Bis(2-ethylhexyl) phthalate	89	JB	390	410	B	380	150	JB	380	46	JB	380	58	JB	370	67	JB	370	23	J	340
Butylbenzylphthalate	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Carbazole	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Chrysene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Di-n-butylphthalate	26	J	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Di-n-octylphthalate	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Dibenz[a,h]anthracene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Dibenzofuran	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Diethylphthalate	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Dimethyl phthalate	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Fluoranthene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Fluorene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Hexachlorobenzene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
Hexachlorobutadiene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
Hexachlorocyclopentadiene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
Hexachloroethane	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
Indeno(1,2,3-cd)pyrene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
Isophorone	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
N-Nitroso-di-n-dipropylamine	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
N-Nitrosodiphenylamine	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
Naphthalene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
Nitrobenzene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
Pentachlorophenol	970	U	970	940	U	940	950	U	950	960	U	960	920	U	920	940	U	940	860	UJ	860
Phenanthrene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340
Phenol	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	UJ	340
Pyrene	390	U	390	380	U	380	380	U	380	380	U	380	370	U	370	370	U	370	340	U	340

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J169X0 Sample FS-4 Sample Date 2/13/08			J169X1 Sample FS-5 Sample Date 2/13/08			J16945 Sample FS-1 Sample Date 2/13/08			J16946 Sample FS-2 Sample Date 2/13/08			J16934 Sample SZ-1 Sample Date 2/14/08			J16935 Sample SZ-2 Sample Date 2/14/08			J16936 Sample SZ-3 Sample Date 2/14/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
	Polychlorinated Biphenyls (PCBs)																				
Aroclor-1016	14	U	14	14	U	14	15	U	15	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1221	14	U	14	14	U	14	15	U	15	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1232	14	U	14	14	U	14	15	U	15	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1242	14	U	14	14	U	14	15	U	15	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1248	14	U	14	14	U	14	15	U	15	14	U	14	14	U	14	14	U	14	14	U	14
Aroclor-1254	14	U	14	14	U	14	15	U	15	92		14	14	U	14	14	U	14	14	U	14
Aroclor-1260	14	U	14	14	U	14	15	U	15	60		14	14	U	14	14	U	14	14	U	14
Pesticides																					
Aldrin																					
Alpha-BHC																					
alpha-Chlordane																					
beta-1,2,3,4,5,6-Hexachlorocyclohexane																					
Delta-BHC																					
Dichlorodiphenyldi-chloroethane																					
Dichlorodiphenyldi-chloroethylene																					
Dichlorodiphenyltri-chloroethane																					
Dieldrin																					
Endosulfan I																					
Endosulfan II																					
Endosulfan sulfate																					
Endrin																					
Endrin aldehyde																					
Endrin ketone																					
Gamma-BHC (Lindane)																					
gamma-Chlordane																					
Heptachlor																					
Heptachlor epoxide																					
Methoxychlor																					
Toxaphene																					

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J169XO Sample FS-4 Sample Date 2/13/08			J169X1 Sample FS-5 Sample Date 2/13/08			J16945 Sample FS-1 Sample Date 2/13/08			J16946 Sample FS-2 Sample Date 2/13/08			J16934 Sample SZ-1 Sample Date 2/14/08			J16935 Sample SZ-2 Sample Date 2/14/08			J16936 Sample SZ-3 Sample Date 2/14/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organics (SVOAs)																					
1,2,4-Trichlorobenzene	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
1,2-Dichlorobenzene	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
1,3-Dichlorobenzene	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
1,4-Dichlorobenzene	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
2,4,5-Trichlorophenol	890	U	890	870	U	870	930	U	930	890	U	890	870	U	870	860	U	860	890	U	890
2,4,6-Trichlorophenol	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
2,4-Dichlorophenol	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
2,4-Dimethylphenol	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
2,4-Dinitrophenol	890	UJ	890	870	UJ	870	930	UJ	930	890	UJ	890	870	U	870	860	U	860	890	U	890
2,4-Dinitrotoluene	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
2,6-Dinitrotoluene	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
2-Chloronaphthalene	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
2-Chlorophenol	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
2-Methylnaphthalene	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
2-Methylphenol (cresol, o-)	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
2-Nitroaniline	890	U	890	870	U	870	930	U	930	890	U	890	870	U	870	860	U	860	890	U	890
2-Nitrophenol	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
3+4 Methylphenol (cresol, m+p)	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
3,3'-Dichlorobenzidine	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
3-Nitroaniline	890	UJ	890	870	UJ	870	930	UJ	930	890	UJ	890	870	U	870	860	U	860	890	U	890
4,6-Dinitro-2- methylphenol	890	UJ	890	870	UJ	870	930	UJ	930	890	UJ	890	870	U	870	860	U	860	890	U	890
4-Bromophenylphenyl ether	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
4-Chloro-3-methylphenol	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
4-Chloroaniline	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
4-Chlorophenylphenyl ether	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
4-Nitroaniline	890	U	890	870	U	870	930	U	930	890	U	890	870	U	870	860	U	860	890	U	890
4-Nitrophenol	890	U	890	870	U	870	930	U	930	890	U	890	870	U	870	860	U	860	890	U	890
Acenaphthene	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
Acenaphthylene	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
Anthracene	350	U	350	350	U	350	370	U	370	20	J	360	26	J	350	340	U	340	350	U	350
Benzo(a)anthracene	30	J	350	350	U	350	370	U	370	90	J	360	130	J	350	66	J	340	30	J	350
Benzo(a)pyrene	32	J	350	350	U	350	370	U	370	71	J	360	120	J	350	68	J	340	35	J	350
Benzo(b)fluoranthene	25	J	350	350	U	350	370	U	370	49	J	360	96	J	350	62	J	340	38	J	350

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J169XO Sample FS-4 Sample Date 2/13/08			J169X1 Sample FS-5 Sample Date 2/13/08			J16945 Sample FS-1 Sample Date 2/13/08			J16946 Sample FS-2 Sample Date 2/13/08			J16934 Sample SZ-1 Sample Date 2/14/08			J16935 Sample SZ-2 Sample Date 2/14/08			J16936 Sample SZ-3 Sample Date 2/14/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs (continued)																					
Benzo(ghi)perylene	22	J	350	350	U	350	370	U	370	67	J	360	87	J	350	56	J	340	350	U	350
Benzo(k)fluoranthene	41	J	350	350	U	350	370	U	370	68	J	360	101	J	350	59	J	340	34	J	350
Bis(2-chloro-1-methylethyl)ether	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
Bis(2-Chloroethoxy)methane	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
Bis(2-chloroethyl) ether	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
Bis(2-ethylhexyl) phthalate	350	J	350	350	J	350	370	J	370	21	J	360	31	JB	350	26	JB	340	149	JB	350
Butylbenzylphthalate	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
Carbazole	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
Chrysene	46	J	350	350	U	350	370	U	370	120	J	360	159	J	350	84	J	340	56	J	350
Di-n-butylphthalate	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
Di-n-octylphthalate	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
Dibenz[a,h]anthracene	350	U	350	350	U	350	370	U	370	360	U	360	36	J	350	340	U	340	350	U	350
Dibenzofuran	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
Diethylphthalate	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
Dimethyl phthalate	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
Fluoranthene	63	J	350	350	U	350	370	U	370	130	J	360	287	J	350	131	J	340	67	J	350
Fluorene	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
Hexachlorobenzene	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
Hexachlorobutadiene	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
Hexachlorocyclopentadiene	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
Hexachloroethane	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
Indeno(1,2,3-cd)pyrene	24	J	350	350	UJ	350	370	UJ	370	47	J	360	74	J	350	57	J	340	350	U	350
Isophorone	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
N-Nitroso-di-n-dipropylamine	350	U	350	350	U	350	370	U	370	360	U	360	350	U	350	340	U	340	350	U	350
N-Nitrosodiphenylamine	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
Naphthalene	350	UJ	350	350	UJ	350	370	UJ	370	22.636	J	360	350	U	350	340	U	340	350	U	350
Nitrobenzene	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
Pentachlorophenol	890	UJ	890	870	UJ	870	930	UJ	930	890	UJ	890	870	U	870	860	U	860	890	U	890
Phenanthrene	27	J	350	350	U	350	370	U	370	140	J	360	145	J	350	78	J	340	42	J	350
Phenol	350	UJ	350	350	UJ	350	370	UJ	370	360	UJ	360	350	U	350	340	U	340	350	U	350
Pyrene	63	J	350	350	U	350	370	U	370	310	J	360	268	J	350	149	J	340	67	J	350

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J16937 Sample SZ-4 Sample Date 2/14/08			J16938 Sample SZ-5 Sample Date 2/14/08			J16939 Sample SZ-6 Sample Date 2/14/08			J16940 Sample SZ-7 Sample Date 2/14/08			J16941 Sample SZ-8 Sample Date 2/14/08			J16942 Sample SZ-9 Sample Date 2/14/08			J16943 Sample SZ-10 Sample Date 2/14/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
	Polychlorinated Biphenyls (PCBs)																				
Aroclor-1016	15	U	15	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	16	U	16
Aroclor-1221	15	U	15	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	16	U	16
Aroclor-1232	15	U	15	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	16	U	16
Aroclor-1242	15	U	15	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	16	U	16
Aroclor-1248	15	U	15	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	16	U	16
Aroclor-1254	4	J	15	14	U	14	19		14	14	U	14	14	U	14	5	J	14	16	U	16
Aroclor-1260	15	U	15	14	U	14	9	J	14	14	U	14	14	U	14	17		14	3.9	J	16
Pesticides																					
Aldrin																					
Alpha-BHC																					
alpha-Chlordane																					
beta-1,2,3,4,5,6-Hexachlorocyclohexane																					
Delta-BHC																					
Dichlorodiphenyldi-chloroethane																					
Dichlorodiphenyldi-chloroethylene																					
Dichlorodiphenyltri-chloroethane																					
Dieldrin																					
Endosulfan I																					
Endosulfan II																					
Endosulfan sulfate																					
Endrin																					
Endrin aldehyde																					
Endrin ketone																					
Gamma-BHC (Lindane)																					
gamma-Chlordane																					
Heptachlor																					
Heptachlor epoxide																					
Methoxychlor																					
Toxaphene																					

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J16937 Sample SZ-4 Sample Date 2/14/08			J16938 Sample SZ-5 Sample Date 2/14/08			J16939 Sample SZ-6 Sample Date 2/14/08			J16940 Sample SZ-7 Sample Date 2/14/08			J16941 Sample SZ-8 Sample Date 2/14/08			J16942 Sample SZ-9 Sample Date 2/14/08			J16943 Sample SZ-10 Sample Date 2/14/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organics (SVOAs)																					
1,2,4-Trichlorobenzene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
1,2-Dichlorobenzene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
1,3-Dichlorobenzene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
1,4-Dichlorobenzene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
2,4,5-Trichlorophenol	930	U	930	890	U	890	900	U	900	880	U	880	900	U	900	900	U	900	970	U	970
2,4,6-Trichlorophenol	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
2,4-Dichlorophenol	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
2,4-Dimethylphenol	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
2,4-Dinitrophenol	930	U	930	890	U	890	900	U	900	880	U	880	900	U	900	900	U	900	970	U	970
2,4-Dinitrotoluene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
2,6-Dinitrotoluene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
2-Chloronaphthalene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
2-Chlorophenol	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
2-Methylnaphthalene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
2-Methylphenol (cresol, o-)	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
2-Nitroaniline	930	U	930	890	U	890	900	U	900	880	U	880	900	U	900	900	U	900	970	U	970
2-Nitrophenol	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
3+4 Methylphenol (cresol, m+p)	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
3,3'-Dichlorobenzidine	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
3-Nitroaniline	930	U	930	890	U	890	900	U	900	880	U	880	900	U	900	900	U	900	970	U	970
4,6-Dinitro-2- methylphenol	930	U	930	890	U	890	900	U	900	880	U	880	900	U	900	900	U	900	970	U	970
4-Bromophenylphenyl ether	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
4-Chloro-3-methylphenol	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
4-Chloroaniline	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
4-Chlorophenylphenyl ether	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
4-Nitroaniline	930	U	930	890	U	890	900	U	900	880	U	880	900	U	900	900	U	900	970	U	970
4-Nitrophenol	930	U	930	890	U	890	900	U	900	880	U	880	900	U	900	900	U	900	970	U	970
Acenaphthene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Acenaphthylene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Anthracene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Benzo(a)anthracene	370	U	370	350	U	350	18	J	360	350	U	350	360	U	360	360	U	360	390	U	390
Benzo(a)pyrene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Benzo(b)fluoranthene	370	U	370	350	U	350	18	J	360	350	U	350	360	U	360	360	U	360	390	U	390

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J16937 Sample SZ-4 Sample Date 2/14/08			J16938 Sample SZ-5 Sample Date 2/14/08			J16939 Sample SZ-6 Sample Date 2/14/08			J16940 Sample SZ-7 Sample Date 2/14/08			J16941 Sample SZ-8 Sample Date 2/14/08			J16942 Sample SZ-9 Sample Date 2/14/08			J16943 Sample SZ-10 Sample Date 2/14/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
	SVOAs (continued)																				
Benzo(ghi)perylene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Benzo(k)fluoranthene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Bis(2-chloro-1-methylethyl)ether	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Bis(2-Chloroethoxy)methane	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Bis(2-chloroethyl) ether	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Bis(2-ethylhexyl) phthalate	39	JB	370	31	JB	350	62	JB	360	36	JB	350	36	JB	360	23	JB	360	38	JB	390
Butylbenzylphthalate	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Carbazole	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Chrysene	370	U	370	350	U	350	26	J	360	350	U	350	360	U	360	360	U	360	390	U	390
Di-n-butylphthalate	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Di-n-octylphthalate	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Dibenz[a,h]anthracene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Dibenzofuran	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Diethylphthalate	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Dimethyl phthalate	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Fluoranthene	370	U	370	350	U	350	18	J	360	350	U	350	360	U	360	360	U	360	390	U	390
Fluorene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Hexachlorobenzene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Hexachlorobutadiene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Hexachlorocyclopentadiene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Hexachloroethane	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Indeno(1,2,3-cd)pyrene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Isophorone	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
N-Nitroso-di-n-dipropylamine	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
N-Nitrosodiphenylamine	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Naphthalene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Nitrobenzene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Pentachlorophenol	930	U	930	890	U	890	900	U	900	880	U	880	900	U	900	900	U	900	970	U	970
Phenanthrene	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Phenol	370	U	370	350	U	350	360	U	360	350	U	350	360	U	360	360	U	360	390	U	390
Pyrene	370	U	370	350	U	350	26	J	360	350	U	350	360	U	360	360	U	360	390	U	390

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J16944 Duplicate of SZ-10 Sample Date 2/14/08			J14JT7 Inprocess Sample Sample Date 2/14/07			J16933 Equipment Blank Sample Date 2/14/08			J16M53 Sample OB-1 Sample Date 4/10/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Polychlorinated Byphenyls (PCBs)												
Aroclor-1016	16	U	16							14	U	14
Aroclor-1221	16	U	16							14	U	14
Aroclor-1232	16	U	16							14	U	14
Aroclor-1242	16	U	16							14	U	14
Aroclor-1248	16	U	16							14	U	14
Aroclor-1254	16	U	16							72		14
Aroclor-1260	16	U	16							77		14
Pesticides												
Aldrin												
Alpha-BHC												
alpha-Chlordane												
beta-1,2,3,4,5,6-Hexachlorocyclohexane												
Delta-BHC												
Dichlorodiphenyldi-chloroethane												
Dichlorodiphenyldi-chloroethylene												
Dichlorodiphenyltri-chloroethane												
Dieldrin												
Endosulfan I												
Endosulfan II												
Endosulfan sulfate												
Endrin												
Endrin aldehyde												
Endrin ketone												
Gamma-BHC (Lindane)												
gamma-Chlordane												
Heptachlor												
Heptachlor epoxide												
Methoxychlor												
Toxaphene												

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J16944 Duplicate of SZ-10 Sample Date 2/14/08			J14JT7 Inprocess Sample Sample Date 2/14/07			J16933 Equipment Blank Sample Date 2/14/08			J16M53 Sample OB-1 Sample Date 4/10/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organics (SVOAs)												
1,2,4-Trichlorobenzene	390	U	390				340	U	340	360	U	360
1,2-Dichlorobenzene	390	U	390				340	U	340	360	U	360
1,3-Dichlorobenzene	390	U	390				340	U	340	360	U	360
1,4-Dichlorobenzene	390	U	390				340	U	340	360	U	360
2,4,5-Trichlorophenol	980	U	980				840	U	840	890	U	890
2,4,6-Trichlorophenol	390	U	390				340	U	340	360	U	360
2,4-Dichlorophenol	390	U	390				340	U	340	360	U	360
2,4-Dimethylphenol	390	U	390				340	U	340	360	U	360
2,4-Dinitrophenol	980	U	980				840	U	840	890	U	890
2,4-Dinitrotoluene	390	U	390				340	U	340	360	U	360
2,6-Dinitrotoluene	390	U	390				340	U	340	360	U	360
2-Chloronaphthalene	390	U	390				340	U	340	360	U	360
2-Chlorophenol	390	U	390				340	U	340	360	U	360
2-Methylnaphthalene	390	U	390				340	U	340	23	J	360
2-Methylphenol (cresol, o-)	390	U	390				340	U	340	360	U	360
2-Nitroaniline	980	U	980				840	U	840	890	U	890
2-Nitrophenol	390	U	390				340	U	340	360	U	360
3+4 Methylphenol (cresol, m+p)	390	U	390				340	U	340	360	U	360
3,3'-Dichlorobenzidine	390	U	390				340	U	340	360	U	360
3-Nitroaniline	980	U	980				840	U	840	890	U	890
4,6-Dinitro-2- methylphenol	980	U	980				840	U	840	890	U	890
4-Bromophenylphenyl ether	390	U	390				340	U	340	360	U	360
4-Chloro-3-methylphenol	390	U	390				340	U	340	360	U	360
4-Chloroaniline	390	U	390				340	U	340	360	U	360
4-Chlorophenylphenyl ether	390	U	390				340	U	340	360	U	360
4-Nitroaniline	980	U	980				840	U	840	37	J	890
4-Nitrophenol	980	U	980				840	U	840	890	U	890
Acenaphthene	390	U	390				340	U	340	360	U	360
Acenaphthylene	390	U	390				340	U	340	360	U	360
Anthracene	390	U	390				340	U	340	360	U	360
Benzo(a)anthracene	390	U	390				340	U	340	21	J	360
Benzo(a)pyrene	390	U	390				340	U	340	23	J	360
Benzo(b)fluoranthene	390	U	390				340	U	340	26	J	360

Table B-6. 100-F-26:9 Organic Verification Sampling Results. (24 Pages)

Constituent	J16944 Duplicate of SZ-10 Sample Date 2/14/08			J14JT7 Inprocess Sample Sample Date 2/14/07			J16933 Equipment Blank Sample Date 2/14/08			J16M53 Sample OB-1 Sample Date 4/10/08		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
SVOAs (continued)												
Benzo(ghi)perylene	390	U	390				340	U	340	27	J	360
Benzo(k)fluoranthene	390	U	390				340	U	340	21	J	360
Bis(2-chloro-1-methylethyl)ether	390	U	390				340	U	340	360	U	360
Bis(2-Chloroethoxy)methane	390	U	390				340	U	340	360	U	360
Bis(2-chloroethyl) ether	390	U	390				340	U	340	360	U	360
Bis(2-ethylhexyl) phthalate	32	JB	390				340	U	340	310	JB	360
Butylbenzylphthalate	390	U	390				340	U	340	360	U	360
Carbazole	390	U	390				340	U	340	360	U	360
Chrysene	390	U	390				340	U	340	44	J	360
Di-n-butylphthalate	390	U	390				340	U	340	360	U	360
Di-n-octylphthalate	390	U	390				340	U	340	360	U	360
Dibenz[a,h]anthracene	390	U	390				340	U	340	360	U	360
Dibenzofuran	390	U	390				340	U	340	360	U	360
Diethylphthalate	390	U	390				340	U	340	360	U	360
Dimethyl phthalate	390	U	390				340	U	340	360	U	360
Fluoranthene	390	U	390				340	U	340	32	J	360
Fluorene	390	U	390				340	U	340	360	U	360
Hexachlorobenzene	390	U	390				340	U	340	360	U	360
Hexachlorobutadiene	390	U	390				340	U	340	360	U	360
Hexachlorocyclopentadiene	390	U	390				340	U	340	360	U	360
Hexachloroethane	390	U	390				340	U	340	360	U	360
Indeno(1,2,3-cd)pyrene	390	U	390				340	U	340	360	U	360
Isophorone	390	U	390				340	U	340	360	U	360
N-Nitroso-di-n-dipropylamine	390	U	390				340	U	340	360	U	360
N-Nitrosodiphenylamine	390	U	390				340	U	340	360	U	360
Naphthalene	390	U	390				340	U	340	30	J	360
Nitrobenzene	390	U	390				340	U	340	360	U	360
Pentachlorophenol	980	U	980				840	U	840	890	U	890
Phenanthrene	390	U	390				340	U	340	35	J	360
Phenol	390	U	390				340	U	340	360	U	360
Pyrene	390	U	390				340	U	340	59	J	360

APPENDIX C

CALCULATION BRIEFS

APPENDIX C

CALCULATION BRIEFS

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

100-F-26:9 Cleanup Verification 95% UCL Calculation, Calculation No. 0100F-CA-V0353, Rev. 0.

100-F-26:9 Waste Site Cleanup Verification Hazard Quotient and Carcinogenic Risk Calculation, Calculation No. 0100F-CA-V0354, Rev. 0.

100-F-26:9 Confirmatory Sampling Hazard Quotient and Carcinogenic Risk Calculation, Calculation No. 0100F-CA-V0363, Rev. 0.

100-F-26:9 Staging Pile Cleanup Verification 95% UCL Calculation, Calculation No. 0100F CA V0364, Rev. 0.

100-F-26:9 Staging Pile Hazard Quotient and Carcinogenic Risk Calculation, Calculation No. 0100F-CA-V0365, Rev. 0.

DISCLAIMER FOR CALCULATIONS

The calculation that is provided in this appendix has been generated to document compliance with established cleanup levels. This calculation should be used in conjunction with other relevant documents in the administrative record.

Calculation Brief Distribution Sheet**Calculation Number: 0100F-CA-V0353****100-F-26:9 Cleanup Verification 95% UCL Calculation****COA: R10F26-N6W0**

TITLE	NAME	MSIN	COPIES
Originator	L. D. Habel	H4-23	1
Checker	H. M. Sulloway	H4-23	1
Reviewer	NA		
Approver	J. D. Fancher	X9-07	
CVP Files			
Document Control	M. L. Cockrum	H4-11	1
100 Area Project Files			
Calc. Brief Files	M. T. Hughes	H4-23	Original
Other			

Acrobat 8.0

CALCULATION COVER SHEETProject Title: 100-F Field RemediationJob No. **14655**Area: 100-FDiscipline: Environmental*Calculation No: 0100F-CA-V0353Subject: 100-F-26:9 Cleanup Verification 95% UCL CalculationComputer Program: ExcelProgram No: Excel 2003

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

Committed Calculation ☒Preliminary ☐Superseded ☐Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Sheets = 17 Attn. 1 = 21 Total = 39	L. D. Habel	H. M. Sulloway	NA	J. D. Fancher	4/3/88

SUMMARY OF REVISION

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel *LKH* Date 04/03/08 Calc. No. 0100F-CA-V0353 Rev. No. 0
 Project 100-F Field Remediation Job No. 14655 Checked H. M. Sulloway *HMS* Date 04/03/08
 Subject 100-F-26:9 Pipelines Cleanup Verification 95% UCL Calculation Sheet No. 1 of 17

Summary**Purpose:**

Calculate the 95% upper confidence limit (UCL) values to evaluate compliance with cleanup standards for the shallow zone excavation of the subject site. Also, perform the Washington Administrative Code (WAC) 173-340-740(7)(e) 3-part test for nonradionuclide contaminants of concern (COCs) and contaminants of potential concern (COPCs) and calculate the relative percent difference (RPD) for primary-duplicate sample pairs, as necessary.

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 Sheet 17 - Split/Duplicate Analysis (Excavation Shallow Zone)
 Attachment 1 - Verification Sampling Results (21 sheets)

Given/References:

- 1) Sample Results (Attachment 1).
- 2) Background values and remedial action goals (RAGs) are from DOE-RL (1996), DOE-RL (2001), DOE-RL (2005b) and Ecology (2005).
- 3) DOE-RL, 2005a, 100 Area Remedial Action Sampling and Analysis Plan (SAP), DOE/RL-96-22, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- 4) DOE-RL, 2005b, Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP), DOE/RL-96-17, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- 5) Ecology, 1992, Statistical Guidance for Ecology Site Managers, Publication #92-54, Washington Department of Ecology, Olympia, Washington.
- 6) Ecology, 1993, Statistical Guidance for Ecology Site Managers, Supplement S-6, Analyzing Site or Background Data with Below-detection Limit or Below-PQL Values (Censored Data Sets), Publication #92-54, Washington Department of Ecology, Olympia, Washington.
- 7) Ecology, 2005, Cleanup Levels and Risk Calculations (CLARC) Database, Washington State Department of Ecology, Olympia, Washington, <<https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>>.
- 8) EPA, 1994, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540/R-94/013. U.S. Environmental Protection Agency, Washington, D.C.
- 9) WAC 173-340, 1996, "Model Toxic Control Act - Cleanup," Washington Administrative Code.
- 10) WCH, 2008, *Work Instruction for Verification Sampling of 100-F-26:9, 1607-F2 Sanitary Sewer Pipelines*, 0100F-WI-G0067, Rev. 0. Washington Closure Hanford, Inc., Richland, Washington.

Solution:

Calculation methodology is described in Ecology publication #92-54 (Ecology 1992, 1993), below, and in the RDR/RAWP (DOE-RL 2005b). 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 primary-duplicate sample pairs, as required. 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 data from soil verification samples from the subject waste site. The data were entered into an EXCEL 2003 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 2005b) is documented by this calculation. Duplicate RPD results are used in evaluation of data quality within the RSVP for this site.

This calculation only pertains to the excavation shallow zone (SZ) and overburden (OB) sample locations (and four samples located at the center of four overburden stockpiles). Refer to section 5.2.2 of the work instruction (WCH 2008) for additional discussion of the overburden sample design. Three other sample types were collected as grab samples and were not statistically derived. The sample types were: focused samples taken within the shallow zone excavation (FS and RC) and the overburden used to provide backfill material (FB). These results are contained in the attachment and will be evaluated using direct comparison of the maximum values against the RAGs.

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Summary (continued)

UCL Methodology:

For nonradioactive analytes with ≤50% of the data below detection limits and all detected radionuclide analytes, 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, the maximum detected value for the data set is used instead of the 95% UCL. The 95% UCL is not calculated for data sets with no reported detections. The evaluation of the portion of each analyte's data set below detection limits was performed by direct inspection of the attached sample results, and no further calculations were performed for those data sets where >50% of the data was below detection limits.

Calculated cleanup levels are not available in Ecology (2005) under WAC 173-340-740(3) for:

aluminum, calcium, iron, magnesium, potassium, silicon, and sodium;

therefore, these constituents are not considered site COPCs and are also not included in these tables.

The 95% UCL values were not calculated for radium-226, radium-228, thorium-228, thorium-232, and potassium-40, as these isotopes are excluded from consideration as COCs based on natural occurrence and analogous site information.

All nonradionuclide data reported as being undetected are set to ½ the detection limit value for calculation of the statistics (Ecology 1993). 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) and all radionuclide data sets, 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 and calculation of the 95% UCL is done using Ecology's MTCASat software (Ecology 1993). Due to differences in addressing censored data between the RDR/RAWP (DOE-RL 2005b) and MTCASat coding and due to a limitation in the MTCASat 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 input 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,
- 2) greater than 10% of the raw data exceed the most stringent cleanup limit for each COPC,
- 3) the maximum value of the raw data set exceeds two times the most stringent cleanup limit for each COPC.

The WAC 173-340-740(7)(e) 3-part test is not performed for COPCs where the statistical value defaults to the maximum value in the data set. Instead, direct comparison of the maximum value against site remedial action goals (RAGs) (within the RSVP) is used as the compliance basis.

The RPD values are evaluated for analytes detected in a primary-duplicate or primary-split sample pair for the purposes of data quality assessment within the CVP. The RPD is calculated when both the primary value and the duplicate value for a given analyte are above detection limits and are greater than 5 times the target detection limit (TDL). 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) split and duplicate RPD calculations, a value less than 30% indicates the data compare favorably. For regulatory splits, a threshold of 35% is used (EPA 1994b). If the RPD is greater than 30% (or 35% for regulatory split data), 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 results exceed a control limit of 2 times the TDL, further assessment regarding the usability of the data is performed. Additional discussion is provided in the data quality assessment section of the applicable RSVP, as necessary.

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Washington Closure HanfordOriginator L. D. HabelDate 04/03/08Calc. No. 0100F-CA-V0353Rev. No. 0Project 100-F Field RemediationJob No. 14655Checked H. M. SullowayDate 04/03/08Subject 100-F-26:9 Pipelines Cleanup Verification 95% UCL CalculationSheet No. 3 of 171 **Summary (continued)**3 **Methodology (continued):**

4 For quality assurance/quality control (QA/QC) split and duplicate RPD calculations, a value less than 30% indicates the data
 5 compare favorably. For regulatory splits, a threshold of 35% is used (EPA 1994). If the RPD is greater than 30% (or 35%
 6 for regulatory split data), further investigation regarding the usability of the data is performed. No split samples were
 7 collected for cleanup verification of the subject site. Additional discussion is provided in the data quality assessment section
 8 of the applicable RSVP, as necessary.

11 **Results:**

13 The results presented in the tables that follow include the summary of the results of the 95% UCL calculations or the
 14 maximum value, the WAC 173-340-740(7)(e) 3-part test evaluation, and the RPD calculations, and are for use in risk
 15 analysis and the RSVP for this site.

17 Sample J16947 (OB-1) had TPH concentration in excess of the RAG. The entire pile associated with this sample was
 18 removed, so the data is not used in the UCL calculation. As a result, the sample numbers for the overburden stockpile are
 19 sequenced OB-2 through OB-14.

21 **Results Summary^a**

Analyte	Excavation Shallow Zone ^b	Overburden ^b	Focused Samples ^c	Units
Cesium-137	--	0.031	0.289	pCi/g
Antimony	--	1.0	1.6	mg/kg
Arsenic	2.6	2.8	2.7	mg/kg
Barium	109	170	329	mg/kg
Beryllium	0.27	0.29	0.39	mg/kg
Boron	8.4	25.7	28.6	mg/kg
Cadmium	0.20	--	0.23	mg/kg
Chromium	9.1	8.5	9.0	mg/kg
Hexavalent Chromium	0.38	0.27	0.36	mg/kg
Cobalt	6.3	6.3	6.2	mg/kg
Copper	14.5	17.5	26.5	mg/kg
Lead	6.0	7.3	16.9	mg/kg
Manganese	288	279	274	mg/kg
Mercury	0.27	0.10	0.04	mg/kg
Molybdenum	--	1.3	1.1	mg/kg
Nickel	10.1	10.6	9.5	mg/kg
Selenium	--	--	1.3	mg/kg
Silver	--	--	1.2	mg/kg
Vanadium	42.8	39.8	42.3	mg/kg
Zinc	44.2	44.2	77.6	mg/kg
Aroclor-1254	19	--	92	ug/kg
Aroclor-1260	17	180	60	ug/kg
Anthracene	26	22	20	ug/kg
Benzo(a)anthracene	130	100	90	ug/kg
Benzo(a)pyrene	120	110	--	ug/kg
Benzo(b)fluoranthene	96	89	49	ug/kg
Benzo(ghi)perylene	87	70	67	ug/kg
Benzo(k)fluoranthene	101	97	68	ug/kg
Bis(2-ethylhexyl) phthalate	66	295	450	ug/kg
Chrysene	159	140	120	ug/kg
Dibenz(a,h)anthracene	36	22	--	ug/kg
Fluoranthene	287	220	130	ug/kg
Indeno(1,2,3-cd)pyrene	74	71	47	ug/kg
Naphthalene	--	18	23	ug/kg
Phenanthrene	145	110	140	ug/kg
Pyrene	268	260	310	ug/kg

59 ^aNo detections were reported in any data set for COCs/COPCs not listed in this table.

60 ^bMaximum or 95% UCL result, depending on data censorship, as described in the calculation methodology.

61 ^cFocused samples include non-statistically derived sample locations that were placed near road crossings. They also include samples taken from overburden stockpiles that were used as backfill for the road crossings. The maximum value for each analyte is shown.

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel *LH* Date 04/03/08
 Project 100-F Field Remediation Job No. 14655
 Subject 100-F-26:9 Pipelines Cleanup Verification 95% UCL Calculation

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 Sheet No. 4 of 17

1 Summary (continued)

2

3 Excavation Shallow Zone - WAC 173-340 3-Part Test for most stringent RAG:

4 95% UCL > Cleanup Limit? NO

5 > 10% above Cleanup Limit? NO

6 Any sample > 2x Cleanup Limit? NO

7

8 All data sets evaluated meet the 3-part test criteria when compared to the most stringent cleanup limit.

9

10 Overburden - WAC 173-340 3-Part Test for most stringent RAG:

11 95% UCL > Cleanup Limit? YES

12 > 10% above Cleanup Limit? YES

13 Any sample > 2x Cleanup Limit? YES

14

15 Because of the "yes" answers to the WAC 173-340 3-part test for barium and lead, additional evaluation of attainment
16 of cleanup criteria will be performed.

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Relative Percent Difference Results^{a,b} -

QA/QC Analysis

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Analyte	Excavation Duplicate Analysis
Potassium-40	53%
Aluminum	9%
Barium	46%
Calcium	25%
Chromium	36%
Copper	62%
Iron	13%
Magnesium	12%
Manganese	1%
Vanadium	20%
Zinc	38%

32 ^aRelative percent difference evaluation was not required for analytes not included in this table.33 ^bThe significance of relative percent difference values are discussed within the RSVP for the subject site.

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36 BCL = below cleanup level

37 CLARC = Cleanup Levels and Risk Calculations

38 COC = contaminant of concern

39 COPC = contaminant of potential concern

40 DE = direct exposure

41 GEA = gamma energy analysis

42 QA/QC = quality assurance/quality control

43 MDA = minimum detectable activity

RAG = remedial action goal

RDR/RAWP = Remedial Design Report/Remedial Action Work Plan

RPD = relative percent difference

RSVP = remaining sites verification package

SAP = Sampling and Analysis Plan

TDL = target detection limit

U = undetected

UCL = upper confidence limit

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CALCULATION SHEET

Originator L. D. Habel
Project 100-F Field Remediation
Subject 100-F-26:9 Pipelines Cleanup Verification 95% UCL Calculation

Date 04/03/08
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Date 04/03/08
Sheet No. 5 of 17

1 100-F-26:9 Excavation Shallow Zone Statistical Calculations

2 Verification Data

Sample Area	Sample Number	Sample Date	Arsenic			Barium			Beryllium			Boron			Chromium			Cobalt			Copper		
			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
SZ-10	J16943	2/14/08	2.1		1.4	73.6		0.28	0.25		0.14	3.6		1.4	8.7		0.57	6.3		0.57	9.0		0.57
Dup. of SZ-10	J16944	2/14/08	3.0		1.5	117		0.30	0.28		0.15	4.2		1.5	12.5		0.61	7.1		0.61	17.0		0.61
SZ-1	J16934	2/14/08	3.3		1.3	62.5		0.25	0.23		0.13	2.4		1.3	8.3		0.51	5.5		0.51	14.1		0.51
SZ-2	J16935	2/14/08	2.7		1.3	56.1		0.26	0.22		0.13	2.6		1.3	9.2		0.52	5.8		0.52	15.7		0.52
SZ-3	J16936	2/14/08	2.2		1.4	64.7		0.27	0.21		0.14	3.1		1.4	7.0		0.54	5.5		0.54	12.4		0.54
SZ-4	J16937	2/14/08	2.5		1.5	63.0		0.30	0.20		0.15	2.9		1.5	9.7		0.59	4.6		0.59	16.0		0.59
SZ-5	J16938	2/14/08	1.8		1.2	41.6		0.23	0.17		0.12	1.2	U	1.2	7.3		0.47	4.6		0.47	11.1		0.47
SZ-6	J16939	2/14/08	1.5	U	1.5	91.9		0.30	0.26		0.15	6.2		1.5	6.7		0.61	6.0		0.61	11.3		0.61
SZ-7	J16940	2/14/08	1.7		1.4	56.2		0.28	0.27		0.14	1.8		1.4	7.6		0.56	6.7		0.56	11.3		0.56
SZ-8	J16941	2/14/08	2.3		1.3	59.1		0.26	0.25		0.13	1.9		1.3	7.7		0.52	6.7		0.52	10.6		0.52
SZ-9	J16942	2/14/08	2.1		1.4	226		0.28	0.34		0.14	23.7		1.4	8.7		0.56	6.2		0.56	15.5		0.56

16 Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Arsenic mg/kg			Barium mg/kg			Beryllium mg/kg			Boron mg/kg			Chromium mg/kg			Cobalt mg/kg			Copper mg/kg		
SZ-10	J16943/J16944	2/14/08	2.6			95			0.27			3.9			10.6			6.7			13.0		
SZ-1	J16934	2/14/08	3.3			62.5			0.23			2.4			8.3			5.5			14.1		
SZ-2	J16935	2/14/08	2.7			56.1			0.22			2.6			9.2			5.8			15.7		
SZ-3	J16936	2/14/08	2.2			64.7			0.21			3.1			7.0			5.5			12.4		
SZ-4	J16937	2/14/08	2.5			63.0			0.20			2.9			9.7			4.6			16.0		
SZ-5	J16938	2/14/08	1.8			41.6			0.17			0.60			7.3			4.6			11.1		
SZ-6	J16939	2/14/08	0.8			91.9			0.26			6.2			6.7			6.0			11.3		
SZ-7	J16940	2/14/08	1.7			56.2			0.27			1.8			7.6			6.7			11.3		
SZ-8	J16941	2/14/08	2.3			59.1			0.25			1.9			7.7			6.7			10.6		
SZ-9	J16942	2/14/08	2.1			226			0.34			23.7			8.7			6.2			15.5		

29 Statistical Computations

95% UCL based on	Arsenic			Barium			Beryllium			Boron			Chromium			Cobalt			Copper		
	Large data set (n ≥10), use MTCASat normal distribution.			Large data set (n ≥10), lognormal and normal distribution rejected, use Z-statistic.			Large data set (n ≥10), use MTCASat lognormal distribution.			Large data set (n ≥10), lognormal and normal distribution rejected, use Z-statistic.			Large data set (n ≥10), use MTCASat lognormal distribution.			Large data set (n ≥10), use MTCASat normal distribution.			Large data set (n ≥10), use MTCASat lognormal distribution.		
N	10			10			10			10			10			10			10		
% < Detection limit	10%			0%			0%			10%			0%			0%			0%		
Mean	2.2			81.6			0.24			4.9			8.3			5.8			13.1		
Standard deviation	0.68			53.3			0.05			6.8			1.3			0.79			2.1		
95% UCL on mean	2.6			109			0.27			8.4			9.1			6.3			14.5		
Maximum detected value	3.3			226			0.34			23.7			12.5			7.1			17.0		
Final Statistical Value (nonRad)	2.6			109			0.27			8.4			9.1			6.3			14.5		
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20	DE & GW & River Protection		132	GW Protection		1.51	GW & River Protection		320	GW Protection		18.5	GW & River Protection		32	GW Protection		22.0	River Protection	
WAC 173-340 3-PART TEST																					
95% UCL > Cleanup Limit?	NO			NO			NO			NO			NO			NO			NO		
> 10% above Cleanup Limit?	NO			NO			NO			NO			NO			NO			NO		
Any sample > 2X Cleanup Limit?	NO			NO			NO			NO			NO			NO			NO		
WAC 173-340 Compliance?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	

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Originator L. D. Habel

Project 100-F Field Remediation

Subject 100-F-26:9 Pipelines Cleanup Verification 95% UCL Calculation

Date 04/03/08

Job No. 14655

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Checked H. M. Sulloway

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CALCULATION SHEET

1 100-F-26:9 Excavation Shallow Zone Statistical Calculations

2 Verification Data

Sample Area	Sample Number	Sample Date	Lead			Manganese			Mercury			Nickel			Vanadium			Zinc			Bis(2-ethylhexyl) phthalate		
			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
SZ-10	J16943	2/14/08	4.4		0.85	317		0.11	0.01		0.01	9.5		0.57	37.4		0.4	37.2		1.7	38.0	JB	390
Dup. of SZ-10	J16944	2/14/08	4.9		0.91	321		0.12	0.34		0.01	10.7		0.61	45.7		0.4	54.4		1.8	32.0	JB	390
SZ-1	J16934	2/14/08	6.1		0.76	239		0.10	0.04		0.01	9.0		0.51	38.0		0.4	42.9		1.5	31.0	JB	350
SZ-2	J16935	2/14/08	7.0		0.78	248		0.10	0.02		0.01	9.9		0.52	37.9		0.4	49.3		1.6	26.0	JB	340
SZ-3	J16936	2/14/08	5.5		0.81	242		0.11	0.02		0.01	9.0		0.54	37.4		0.4	41.2		1.6	149	JB	350
SZ-4	J16937	2/14/08	6.6		0.89	201		0.12	0.15		0.01	9.2		0.59	32.6		0.4	45.7		1.8	39.0	JB	370
SZ-5	J16938	2/14/08	3.5		0.70	208		0.09	0.03		0.01	8.8		0.47	29.2		0.3	28.9		1.4	31.0	JB	350
SZ-6	J16939	2/14/08	3.8		0.91	242		0.12	0.01	U	0.01	8.7		0.61	39.9		0.4	34.6		1.8	62.0	JB	360
SZ-7	J16940	2/14/08	4.0		0.84	284		0.11	0.01	U	0.01	10.6		0.56	48.1		0.4	36.9		1.7	36.0	JB	350
SZ-8	J16941	2/14/08	3.0		0.77	277		0.10	0.01	U	0.01	9.9		0.52	47.5		0.4	36.3		1.5	36.0	JB	360
SZ-9	J16942	2/14/08	5.6		0.85	335		0.11	0.02		0.01	10.9		0.56	37.5		0.4	38.0		1.7	23.0	JB	360

16 Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Lead mg/kg			Manganese mg/kg			Mercury mg/kg			Nickel mg/kg			Vanadium mg/kg			Zinc mg/kg			Bis(2-ethylhexyl) phthalate ug/kg		
SZ-10	J16943/J16944	2/14/08	4.7			319			0.18			10.1			41.6			45.8			35.0		
SZ-1	J16934	2/14/08	6.1			239			0.04			9.0			38.0			42.9			31.0		
SZ-2	J16935	2/14/08	7.0			248			0.02			9.9			37.9			49.3			26.0		
SZ-3	J16936	2/14/08	5.5			242			0.02			9.0			37.4			41.2			149		
SZ-4	J16937	2/14/08	6.6			201			0.15			9.2			32.6			45.7			39.0		
SZ-5	J16938	2/14/08	3.5			208			0.03			8.8			29.2			28.9			31.0		
SZ-6	J16939	2/14/08	3.8			242			0.01			8.7			39.9			34.6			62.0		
SZ-7	J16940	2/14/08	4.0			284			0.01			10.6			48.1			36.9			36.0		
SZ-8	J16941	2/14/08	3.0			277			0.005			9.9			47.5			36.3			36.0		
SZ-9	J16942	2/14/08	5.6			335			0.02			10.9			37.5			38.0			23.0		

29 Statistical Computations

95% UCL based on	Lead			Manganese			Mercury			Nickel			Vanadium			Zinc			Bis(2-ethylhexyl) phthalate		
	Large data set (n ≥10), use MTCASat lognormal distribution.			Large data set (n ≥10), use MTCASat lognormal distribution.			Large data set (n ≥10), use MTCASat lognormal distribution.			Large data set (n ≥10), use MTCASat lognormal distribution.			Large data set (n ≥10), use MTCASat lognormal distribution.			Large data set (n ≥10), use MTCASat lognormal distribution.			Large data set (n ≥10), lognormal and normal distribution rejected, use Z-statistic.		
N	10			10			10			10			10			10			10		
% < Detection limit	0%			0%			30%			0%			0%			0%			0%		
Mean	5.0			260			0.05			9.6			39.0			40.0			46.8		
Standard deviation	1.4			44.0			0.06			0.8			5.8			6.2			37.4		
95% UCL on mean	6.0			288			0.27			10.1			42.8			44.2			66.3		
Maximum detected value	7.0			335			0.34			10.9			48.1			54.4			149		
Final Statistical Value	6.0			288			0.27			10.1			42.8			44.2			66.3		
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	10.2	GW & River Protection		512	GW & River Protection		0.33	GW & River Protection		19.1	GW Protection		85.1	GW Protection		67.8	River Protection		360	River Protection	
WAC 173-340 3-PART TEST																					
95% UCL > Cleanup Limit?	NO			NO			NO			NO			NO			NO			NO		
> 10% above Cleanup Limit?	NO			NO			NO			NO			NO			NO			NO		
Any sample > 2X Cleanup Limit?	NO			NO			NO			NO			NO			NO			NO		
WAC 173-340 Compliance?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	

Washington Closure Hanford

Originator L. D. Habel

Project 100-F Field Remediation

Subject 100-F-26:9 Pipelines Cleanup Verification 95% UCL Calculation

Date 04/03/08

Job No. 14655

Calc. No. 0100F-CA-V0353

Checked H. M. Sulloway

Rev. No. 0

Date 04/03/08

Sheet No. 7 of 17

CALCULATION SHEET

1 100-F-26:9 Overburden Statistical Calculations

2 Verification Data

	Sample Area	Sample Number	Sample Date	Cesium-137			Arsenic			Barium			Beryllium			Boron			Chromium			Hexavalent 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
4	OB-2	J16948	2/6/08	0.066	U	0.066	2.3		1.7	69.3	C	0.33	0.24		0.17	3.3		1.7	6.2		0.67	0.53		0.26	5.4		0.67
5	OB-3	J16949	2/6/08	0.024	U	0.024	2.0		1.5	107	C	0.31	0.25		0.15	5.1		1.5	5.9		0.61	0.24	U	0.24	4.8		0.61
6	OB-4	J16950	2/6/08	0.034	U	0.034	2.2		1.6	53.3	C	0.32	0.19		0.16	1.6	U	1.6	5.3		0.63	0.23	U	0.23	5.2		0.63
7	OB-5	J16951	2/11/08	0.038	U	0.038	2.2		1.5	73.6		0.31	0.20		0.15	2.7		1.5	8.0		0.62	0.21	U	0.21	6.1		0.62
8	OB-6	J16952	2/11/08	0.030	U	0.030	2.9		1.4	86.9		0.28	0.29		0.14	4.8		1.4	8.5		0.57	0.25		0.22	6.6		0.57
9	OB-7	J16953	2/11/08	0.040	U	0.040	2.9		1.4	52.9		0.29	0.23		0.14	1.4	U	1.4	9.0		0.58	0.24		0.21	5.7		0.58
10	OB-8	J16954	2/11/08	0.024	U	0.024	1.4	U	1.4	54.6		0.29	0.23		0.14	1.4	U	1.4	8.9		0.58	0.28		0.21	5.5		0.58
11	OB-9	J16955	2/11/08	0.038	U	0.038	3.5		1.5	66.4		0.31	0.28		0.15	1.8		1.5	7.9		0.62	0.28		0.22	6.6		0.62
12	OB-10	J16956	2/11/08	0.074		0.038	4.2		1.5	520		0.30	0.61		0.15	48.5		1.5	10.6		0.59	0.22	U	0.22	7.3		0.59
13	OB-11	J16957	2/11/08	0.036	U	0.036	1.5	U	1.5	53.5		0.29	0.15	U	0.15	1.5	U	1.5	7.1		0.58	0.26		0.21	5.9		0.58
14	OB-12	J16958	2/11/08	0.028	U	0.028	2.2		1.6	80.7		32.00	0.16	U	0.16	8.0		1.6	6.7		0.63	0.21	U	0.21	6.3		0.63
15	OB-13	J16959	2/11/08	0.032	U	0.032	1.7		1.6	54.7		0.32	0.16	U	0.16	1.6	U	1.6	6.5		0.64	0.29		0.22	5.5		0.64
16	OB-14	J16960	2/11/08	0.033		0.022	2.8		1.4	184		0.28	0.20		0.14	14.3		1.4	8.7		0.55	0.22	U	0.22	6.4		0.55

18 Statistical Computation Input Data

	Sample Area	Sample Number	Sample Date	Cesium-137 pCi/g		Arsenic mg/kg		Barium mg/kg		Beryllium mg/kg		Boron mg/kg		Chromium mg/kg		Hexavalent Chromium mg/kg		Cobalt mg/kg	
19	OB-2	J16948	2/6/08	0.033		2.3		69.3		0.24		3.3		6.2		0.53		5.4	
20	OB-3	J16949	2/6/08	0.012		2.0		107		0.25		5.1		5.9		0.12		4.8	
21	OB-4	J16950	2/6/08	0.017		2.2		53.3		0.19		0.80		5.3		0.12		5.2	
22	OB-5	J16951	2/11/08	0.019		2.2		73.6		0.20		2.7		8.0		0.11		6.1	
23	OB-6	J16952	2/11/08	0.015		2.9		86.9		0.29		4.8		8.5		0.25		6.6	
24	OB-7	J16953	2/11/08	0.020		2.9		52.9		0.23		0.70		9.0		0.24		5.7	
25	OB-8	J16954	2/11/08	0.012		0.70		54.6		0.23		0.70		8.9		0.28		5.5	
26	OB-9	J16955	2/11/08	0.019		3.5		66.4		0.28		1.8		7.9		0.28		6.6	
27	OB-10	J16956	2/11/08	0.074		4.2		520		0.61		48.5		10.6		0.11		7.3	
28	OB-11	J16957	2/11/08	0.018		0.75		53.5		0.08		0.75		7.1		0.26		5.9	
29	OB-12	J16958	2/11/08	0.014		2.2		80.7		0.08		8.0		6.7		0.11		6.3	
30	OB-13	J16959	2/11/08	0.016		1.7		54.7		0.08		0.80		6.5		0.29		5.5	
31	OB-14	J16960	2/11/08	0.033		2.8		184		0.20		14.3		8.7		0.11		6.4	

34 Statistical Computations

35	95% UCL based on	Cesium-137			Arsenic			Barium			Beryllium			Boron			Chromium			Hexavalent Chromium			Cobalt		
36		Radionuclide data set. Use nonparametric z-statistic.			Large data set (n ≥10), use MTCASat normal 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 MTCASat lognormal distribution.			Large data set (n ≥10), use MTCASat lognormal distribution.			Large data set (n ≥10), lognormal and normal distribution rejected, use Z-statistic.			Large data set (n ≥10), use MTCASat lognormal distribution.		
37	N	13			13			13			13			13			13			13			13		
38	% < Detection limit	85%			15%			0%			23%			38%			0%			46%			0%		
39	Mean	0.023			2.3			112			0.23			7.1			7.6			0.22			5.9		
40	Standard deviation	0.017			0.98			128			0.14			13.0			1.5			0.12			0.69		
41	95% UCL on mean	0.031			2.8			170			0.29			25.7			8.5			0.27			6.3		
42	Maximum detected value (nonRad)	NA			4.2			520			0.61			48.5			10.6			0.53			7.3		
43	Final Statistical Value (nonRad)	NA			2.8			170			0.29			25.7			8.5			0.27			6.3		
44	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)				DE & GW & River Protection			132 GW Protection			1.51 GW & River Protection			320 GW Protection			18.5 GW & River Protection			2 River Protection			32 GW Protection		
45	WAC 173-340 3-PART TEST																								
46	95% UCL > Cleanup Limit?																								
47	> 10% above Cleanup Limit?																								
48	Any sample > 2X Cleanup Limit?				NO			YES			NO			NO			NO			NO			NO		
49	WAC 173-340 Compliance?	No				Yes			A detailed assessment using RESRAD will be performed for Barium. The data set meets the 3-part test criteria when compared to direct exposure cleanup levels.			Yes			Yes			Yes			Yes				

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel
Project 100-F Field Remediation
Subject 100-F-26:9 Pipelines Cleanup Verification 95% UCL Calculation

Date 04/03/08
Job No. 14655

Calc. No. 0100F-CA-V0353
Checked H. M. Sulloway

Rev. No. 0
Date 04/03/08
Sheet No. 8 of 17

1 100-F-26:9 Overburden Statistical Calculations

2 Verification Data

Sample Area	Sample Number	Sample Date	Copper			Lead			Manganese			Nickel			Vanadium			Zinc			Bis(2-ethylhexyl) phthalate		
			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
OB-2	J16948	2/6/08	20.9	C	0.67	2.6		1.0	230	C	0.13	8.4		0.67	35.2		0.47	31.0		2.0	42.0	JB	440
OB-3	J16949	2/6/08	14.2	C	0.61	4.4		0.92	246	C	0.12	8.5		0.61	21.3		0.43	28.0		1.8	65.0	JB	410
OB-4	J16950	2/6/08	13.0	C	0.63	2.5		0.95	229	C	0.13	7.9		0.63	30.0		0.44	28.0		1.9	82.0	JB	390
OB-5	J16951	2/11/08	19.9	C	0.62	4.0		0.93	273	C	0.12	9.6		0.62	37.7		0.43	35.5		1.9	490	JB	2900
OB-6	J16952	2/11/08	13.2	C	0.57	4.4		0.85	302	C	0.11	10.0		0.57	40.3		0.40	37.6		1.7	240	JB	360
OB-7	J16953	2/11/08	14.3	C	0.58	7.4		0.87	253	C	0.12	10.5		0.58	33.9		0.40	73.9		1.7	140	JB	350
OB-8	J16954	2/11/08	15.0	C	0.58	8.5		0.87	261	C	0.12	10.8		0.58	36.4		0.40	42.7		1.7	140	JB	360
OB-9	J16955	2/11/08	12.2	C	0.62	3.8		0.93	296	C	0.12	10.0		0.62	41.2		0.43	36.8		1.9	130	JB	370
OB-10	J16956	2/11/08	22.3	C	0.59	11.7		0.89	290	C	0.12	14.7		0.56	44.7		0.41	47.9		1.8	220	JB	370
OB-11	J16957	2/11/08	10.4	C	0.58	5.0		0.87	253	C	0.12	8.7		0.58	40.6		0.41	34.2		1.7	110	JB	350
OB-12	J16958	2/11/08	13.3	C	0.63	2.8		0.95	245	C	0.13	9.1		0.63	44.2		0.44	33.3		1.9	110	JB	110
OB-13	J16959	2/11/08	10.5	C	0.64	3.4		0.96	252	C	0.13	8.0		0.64	37.9		0.45	33.3		1.9	260	JB	370
OB-14	J16960	2/11/08	18.8	C	0.55	8.8		0.83	310	C	0.11	10.6		0.55	37.5		0.39	40.8		1.7	330	JB	360

18 Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Copper mg/kg			Lead mg/kg			Manganese mg/kg			Nickel mg/kg			Vanadium mg/kg			Zinc mg/kg			Bis(2-ethylhexyl) phthalate ug/kg		
OB-2	J16948	2/6/08	20.9			2.6			230			8.4			35.2			31.0			42.0		
OB-3	J16949	2/6/08	14.2			4.4			246			8.5			21.3			28.0			65.0		
OB-4	J16950	2/6/08	13.0			2.5			229			7.9			30.0			28.0			82.0		
OB-5	J16951	2/11/08	19.9			4.0			273			9.6			37.7			35.5			490		
OB-6	J16952	2/11/08	13.2			4.4			302			10.0			40.3			37.6			240		
OB-7	J16953	2/11/08	14.3			7.4			253			10.5			33.9			73.9			140		
OB-8	J16954	2/11/08	15.0			8.5			261			10.8			36.4			42.7			140		
OB-9	J16955	2/11/08	12.2			3.8			296			10.0			41.2			36.8			130		
OB-10	J16956	2/11/08	22.3			11.7			290			14.7			44.7			47.9			220		
OB-11	J16957	2/11/08	10.4			5.0			253			8.7			40.6			34.2			110		
OB-12	J16958	2/11/08	13.3			2.8			245			9.1			44.2			33.3			110		
OB-13	J16959	2/11/08	10.5			3.4			252			8.0			37.9			33.3			260		
OB-14	J16960	2/11/08	18.8			8.8			310			10.6			37.5			40.8			330		

34 Statistical Computations

95% UCL based on	Copper			Lead			Manganese			Nickel			Vanadium			Zinc			Bis(2-ethylhexyl) phthalate		
	Large data set (n ≥10), use MTCASat lognormal distribution.			Large data set (n ≥10), use MTCASat lognormal distribution.			Large data set (n ≥10), use MTCASat 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 MTCASat lognormal distribution.		
N	13			13			13			13			13			13			13		
% < Detection limit	0%			0%			0%			0%			0%			0%			0%		
Mean	15.2			5.3			265			9.8			37.0			38.7			181		
Standard deviation	3.9			2.9			27.1			1.8			6.2			12.0			125		
95% UCL on mean	17.5			7.3			279			10.6			39.8			44.2			295		
Maximum detected value	22.3			11.7			310			14.7			44.7			73.9			490		
Final Statistical Value	17.5			7.3			279			10.6			39.8			44.2			295		
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	22.0	River Protection		10.2	GW & River Protection		512	GW & River Protection		19.1	GW Protection		85.1	GW Protection		67.8	River Protection		360	River Protection	
WAC 173-340 3-PART TEST																					
95% UCL > Cleanup Limit?	NO			NO			NO			NO			NO			NO			NO		
> 10% above Cleanup Limit?	NO			NO			NO			NO			NO			NO			NO		
Any sample > 2X Cleanup Limit?	NO			NO			NO			NO			NO			NO			NO		
WAC 173-340 Compliance?	Yes			Yes			Yes			Yes			Yes			Yes			Yes		

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel

Project 100-F Field Remediation

Subject 100-F-26:9 Pipelines Cleanup Verification 95% UCL Calculation

Date 04/03/08

Job No. 14655

Calc. No. 0100F-CA-V0353

Checked H. M. Sulloway

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Date 04/03/08

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Ecology Software (MTCASat) - Excavation Shallow Zone Results

95% UCL Calculation					
DATA	ID	Arsenic			
2.6	J16943/J16944	Number of samples		Uncensored values	
3.3	J16934	Uncensored	10	Mean	2.2
2.7	J16935	Censored		Lognormal mean	2.2
2.2	J16936	Detection limit or PQL		Std. devn.	0.68
2.5	J16937	Method detection limit		Median	2.3
1.8	J16938	TOTAL	10	Min.	0.75
0.75	J16939			Max.	3.3
1.7	J16940				
2.3	J16941				
2.1	J16942				
		Lognormal distribution?		Normal distribution?	
		r-squared is:	0.797	r-squared is:	0.937
		Recommendations:			
		Use normal distribution.			
		UCL (based on t-statistic) is	2.6		

95% UCL Calculation					
DATA	ID	Barium			
95.3	J16943/J16944	Number of samples		Uncensored values	
62.5	J16934	Uncensored	10	Mean	81.6
56.1	J16935	Censored		Lognormal mean	80.6
64.7	J16936	Detection limit or PQL		Std. devn.	53.3
63.0	J16937	Method detection limit		Median	62.8
41.6	J16938	TOTAL	10	Min.	41.6
91.9	J16939			Max.	226
56.2	J16940				
59.1	J16941				
226	J16942				
		Lognormal distribution?		Normal distribution?	
		r-squared is:	0.788	r-squared is:	0.603
Recommendations:					
Reject BOTH lognormal and normal distributions.					
UCL (based on Z-statistic) is			109		

DATA		ID	95% UCL Calculation		Beryllium	
0.27	J16943/J16944	Number of samples	Uncensored values			
0.23	J16934	Uncensored	10	Mean		0.24
0.22	J16935	Censored		Lognormal mean		0.24
0.21	J16936	Detection limit or PQL		Std. devn.		0.05
0.20	J16937	Method detection limit		Median		0.24
0.17	J16938	TOTAL	10	Min.		0.17
0.26	J16939			Max.		0.34
0.27	J16940					
0.25	J16941					
0.34	J16942					
		Lognormal distribution?		Normal distribution?		
		r-squared is:	0.968	r-squared is:	0.943	
		Recommendations:				
		Use lognormal distribution.				
		UCL (Land's method) is		0.27		

95% UCL Calculation					
DATA	ID	Boron			
3.9	J16943/J16944	Number of samples		Uncensored values	
2.4	J16934	Uncensored	10	Mean	4.9
2.6	J16935	Censored		Lognormal mean	4.7
3.1	J16936	Detection limit or PQL		Std. devn.	6.8
2.9	J16937	Method detection limit		Median	2.8
0.60	J16938	TOTAL	10	Min.	0.60
6.2	J16939			Max.	23.7
1.8	J16940				
1.9	J16941				
23.7	J16942				
		Lognormal distribution?		Normal distribution?	
		r-squared is:	0.885	r-squared is:	0.531
		Recommendations:			
		Reject BOTH lognormal and normal distributions.			
		UCL (based on Z-statistic) is	8.4		

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel

Project 100-F Field Remediation

Subject 100-F-26:9 Pipelines Cleanup Verification 95% UCL Calculation

Date 04/03/08

Job No. 14655

Calc. No. 0100F-CA-V0353

Checked H. M. Sulloway *[Signature]*

Rev. No. 0

Date 04/03/08

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Ecology Software (MTCASat) - Excavation Shallow Zone Results

95% UCL Calculation					
DATA	ID	Chromium			
10.6	J16943/J16944	Number of samples		Uncensored values	
8.3	J16934	Uncensored	10	Mean	8.3
9.2	J16935	Censored		Lognormal mean	8.3
7.0	J16936	Detection limit or PQL		Std. devn.	1.3
9.7	J16937	Method detection limit		Median	8.0
7.3	J16938	TOTAL	10	Min.	6.7
6.7	J16939			Max.	10.6
7.6	J16940				
7.7	J16941				
8.7	J16942				
		Lognormal distribution?		Normal distribution?	
		r-squared is:	0.977	r-squared is:	0.961
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	9.1		

95% UCL Calculation					
DATA	ID	Cobalt			
6.7	J16943/J16944	Number of samples		Uncensored values	
5.5	J16934	Uncensored	10	Mean	5.83
5.8	J16935	Censored		Lognormal mean	5.84
5.5	J16936	Detection limit or PQL		Std. devn.	0.79
4.6	J16937	Method detection limit		Median	5.90
4.6	J16938	TOTAL	10	Min.	4.60
6.0	J16939			Max.	6.70
6.7	J16940				
6.7	J16941				
6.2	J16942				
		Lognormal distribution?		Normal distribution?	
		r-squared is:	0.897	r-squared is:	0.913
Recommendations:					
Use normal distribution.					
UCL (based on t-statistic) is			6.3		

		95% UCL Calculation			
DATA	ID	Copper			
13.0	J16943/J16944	Number of samples		Uncensored values	
14.1	J16934	Uncensored	10	Mean	13.1
15.7	J16935	Censored		Lognormal mean	13.1
12.4	J16936	Detection limit or PQL		Std. devn.	2.09
16.0	J16937	Method detection limit		Median	12.7
11.1	J16938	TOTAL	10	Min.	10.6
11.3	J16939			Max.	16.0
11.3	J16940				
10.6	J16941				
15.5	J16942				
		Lognormal distribution?		Normal distribution?	
		r-squared is:	0.918	r-squared is:	0.909
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	14.5		

95% UCL Calculation					
DATA	ID	Lead			
4.7	J16943/J16944	Number of samples		Uncensored values	
6.1	J16934	Uncensored	10	Mean	5.0
7.0	J16935	Censored		Lognormal mean	5.0
5.5	J16936	Detection limit or PQL		Std. devn.	1.4
6.6	J16937	Method detection limit		Median	5.1
3.5	J16938	TOTAL	10	Min.	3.0
3.8	J16939			Max.	7.0
4.0	J16940				
3.0	J16941				
5.6	J16942				
		Lognormal distribution?		Normal distribution?	
		r-squared is:	0.963	r-squared is:	0.967
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	6.0		

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Washington Closure Hanford

Originator L. D. Habel
Project 100-F Field Remediation
Subject 100-F-26:9 Pipelines Cleanup Verification 95% UCL Calculation

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Job No. 14655

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Ecology Software (MTCASat) - Excavation Shallow Zone Results

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95% UCL Calculation					
DATA	ID	Manganese			
319	J15P15/J15P16	Number of samples	Uncensored values		
239	J15P09	Uncensored	10	Mean	260
248	J15P10	Censored		Lognormal mean	260
242	J15P11	Detection limit or PQL		Std. devn.	44.0
201	J15P12	Method detection limit		Median	245
208	J15P13	TOTAL	10	Min.	201
242	J15P14			Max.	335
284	J15P17				
277	J15P18				
335	J15P19				
		Lognormal distribution?	Normal distribution?		
		r-squared is:	0.959	r-squared is:	0.945
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is			
		288			

95% UCL Calculation					
DATA	ID	Nickel			
10.1	J15P15/J15P16	Number of samples	Uncensored values		
9.0	J15P09	Uncensored	10	Mean	9.6
9.9	J15P10	Censored		Lognormal mean	9.6
9.0	J15P11	Detection limit or PQL		Std. devn.	0.78
9.2	J15P12	Method detection limit		Median	9.6
8.8	J15P13	TOTAL	10	Min.	8.7
8.7	J15P14			Max.	10.9
10.6	J15P17				
9.9	J15P18				
10.9	J15P19				
		Lognormal distribution?	Normal distribution?		
		r-squared is:	0.934	r-squared is:	0.929
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is			
		10.1			

95% UCL Calculation					
DATA	ID	Vanadium			
41.6	J15P15/J15P16	Number of samples	Uncensored values		
38.0	J15P09	Uncensored	10	Mean	39.0
37.9	J15P10	Censored		Lognormal mean	39.0
37.4	J15P11	Detection limit or PQL		Std. devn.	5.8
32.6	J15P12	Method detection limit		Median	38.0
29.2	J15P13	TOTAL	10	Min.	29.2
39.9	J15P14			Max.	48.1
48.1	J15P17				
47.5	J15P18				
37.5	J15P19				
		Lognormal distribution?	Normal distribution?		
		r-squared is:	0.936	r-squared is:	0.936
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is			
		42.8			

95% UCL Calculation					
DATA	ID	Zinc			
45.8	J15P15/J15P16	Number of samples	Uncensored values		
42.9	J15P09	Uncensored	10	Mean	40.0
49.3	J15P10	Censored		Lognormal mean	40.0
41.2	J15P11	Detection limit or PQL		Std. devn.	6.2
45.7	J15P12	Method detection limit		Median	39.6
28.9	J15P13	TOTAL	10	Min.	28.9
34.6	J15P14			Max.	49.3
36.9	J15P17				
36.3	J15P18				
38.0	J15P19				
		Lognormal distribution?	Normal distribution?		
		r-squared is:	0.961	r-squared is:	0.977
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is			
		44.2			

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel

Project 100-F Field Remediation

Subject 100-F-26:9 Pipelines Cleanup Verification 95% UCL Calculation

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Ecology Software (MTCASat) - Excavation Shallow Zone Results

95% UCL Calculation					
DATA	ID	Bis(2-ethylhexyl) phthalate			
35.0	J15P15/J15P16	Number of samples		Uncensored values	
31.0	J15P09	Uncensored	10	Mean	46.8
26.0	J15P10	Censored		Lognormal mean	45.7
149	J15P11	Detection limit or PQL		Std. devn.	37.4
39.0	J15P12	Method detection limit		Median	35.5
31.0	J15P13	TOTAL	10	Min.	23.0
62.0	J15P14			Max.	149
36.0	J15P17				
36.0	J15P18				
23.0	J15P19				
		Lognormal distribution?		Normal distribution?	
		r-squared is:	0.767	r-squared is:	0.565
		Recommendations:			
		Reject BOTH lognormal and normal distributions.			
		UCL (based on Z-statistic) is	66.3		

95% UCL Calculation					
DATA	ID	Mercury			
0.18	J15P15/J15P16	Number of samples		Uncensored values	
0.04	J15P09	Uncensored	10	Mean	0.05
0.02	J15P10	Censored		Lognormal mean	0.05
0.02	J15P11	Detection limit or PQL		Std. devn.	0.06
0.15	J15P12	Method detection limit		Median	0.02
0.03	J15P13	TOTAL	10	Min.	0.005
0.01	J15P14			Max.	0.18
0.01	J15P17				
0.005	J15P18				
0.02	J15P19				
		Lognormal distribution?		Normal distribution?	
		r-squared is:	0.915	r-squared is:	0.684
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	0.27		

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Washington Closure Hanford

Originator L. D. Habel

Project 100-F Field Remediation

Subject 100-F-26:9 Pipelines Cleanup Verification 95% UCL Calculation

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Ecology Software (MTCASat) - Excavation Overburden Results

95% UCL Calculation					
DATA	ID	Arsenic			
2.3	J16948	Number of samples		Uncensored values	
2.0	J16949	Uncensored	13	Mean	2.3
2.2	J16950	Censored		Lognormal mean	2.4
2.2	J16951	Detection limit or PQL		Std. devn.	0.98
2.9	J16952	Method detection limit		Median	2.2
2.9	J16953	TOTAL	13	Min.	0.70
0.70	J16954			Max.	4.2
3.5	J16955				
4.2	J16956				
0.75	J16957				
2.2	J16958	Lognormal distribution?		Normal distribution?	
1.7	J16959	r-squared is:	0.851	r-squared is:	0.951
2.8	J16960	Recommendations:			
		Use normal distribution.			
		UCL (based on t-statistic) is		2.8	

95% UCL Calculation					
DATA	ID	Barium			
69.3	J16948	Number of samples		Uncensored values	
107	J16949	Uncensored	13	Mean	112
53.3	J16950	Censored		Lognormal mean	104
73.6	J16951	Detection limit or PQL		Std. devn.	128
86.9	J16952	Method detection limit		Median	69.3
52.9	J16953	TOTAL	13	Min.	52.9
54.6	J16954			Max.	520
66.4	J16955				
520	J16956				
53.5	J16957				
80.7	J16958	Lognormal distribution?		Normal distribution?	
54.7	J16959	r-squared is:	0.718	r-squared is:	0.481
184	J16960	Recommendations:			
Reject BOTH lognormal and normal distributions.					
UCL (based on Z-statistic) is			170		

95% UCL Calculation					
Beryllium					
DATA	ID	Number of samples	Uncensored values		
0.24	J16948	13	Mean		0.23
0.25	J16949		Lognormal mean		0.23
0.19	J16950		Std. devn.		0.14
0.20	J16951		Median		0.23
0.29	J16952		Min.		0.08
0.23	J16953		Max.		0.61
0.23	J16954				
0.28	J16955				
0.61	J16956				
0.08	J16957				
0.08	J16958	Lognormal distribution?	Normal distribution?		
0.08	J16959	r-squared is:	0.869	r-squared is:	0.771
0.20	J16960	Recommendations:			
Reject BOTH lognormal and normal distributions.					
UCL (Land's method) is 0.29					

95% UCL Calculation					
DATA	ID	Boron			
3.3	J16948	Number of samples		Uncensored values	
5.1	J16949	Uncensored	13	Mean	7.1
0.80	J16950	Censored		Lognormal mean	6.7
2.7	J16951	Detection limit or PQL		Std. devn.	13.0
4.8	J16952	Method detection limit		Median	2.7
0.70	J16953	TOTAL	13	Min.	0.70
0.70	J16954			Max.	48.5
1.8	J16955				
48.5	J16956				
0.75	J16957				
8.0	J16958	Lognormal distribution?		Normal distribution?	
0.80	J16959	r-squared is:	0.907	r-squared is:	0.512
14.3	J16960	Recommendations:			
Use lognormal distribution.					
UCL (Land's method) is				25.7	

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Originator L. D. Habel
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Ecology Software (MTCASat) - Excavation Overburden Results

DATA

ID

95% UCL Calculation Chromium

6.2

J16948

Number of samples

Uncensored values

5.9

J16949

Uncensored

13

Mean

7.6

5.3

J16950

Censored

Lognormal mean

7.7

8.0

J16951

Detection limit or PQL

Std. devn.

1.5

8.5

J16952

Method detection limit

Median

7.9

9.0

J16953

TOTAL

13

Min.

5.3

8.9

J16954

Max.

10.6

7.9

J16955

10.6

J16956

7.1

J16957

6.7

J16958

Lognormal distribution?

Normal distribution?

6.5

J16959

r-squared is:

0.977

r-squared is:

0.971

8.7

J16960

Recommendations:

Use lognormal distribution.

UCL (Land's method) is

8.5

DATA

ID

95% UCL Calculation Hexavalent chromium

0.53

J16948

Number of samples

Uncensored values

0.12

J16949

Uncensored

13

Mean

0.22

0.12

J16950

Censored

Lognormal mean

0.22

0.11

J16951

Detection limit or PQL

Std. devn.

0.12

0.25

J16952

Method detection limit

Median

0.24

0.24

J16953

TOTAL

13

Min.

0.11

0.28

J16954

Max.

0.53

0.28

J16955

0.11

J16956

0.26

J16957

0.11

J16958

Lognormal distribution?

Normal distribution?

0.29

J16959

r-squared is:

0.852

r-squared is:

0.795

0.11

J16960

Recommendations:

Reject BOTH lognormal and normal distributions.

UCL (based on Z-statistic) is

0.27

DATA

ID

95% UCL Calculation Cobalt

5.4

J16948

Number of samples

Uncensored values

4.8

J16949

Uncensored

13

Mean

5.9

5.2

J16950

Censored

Lognormal mean

5.9

6.1

J16951

Detection limit or PQL

Std. devn.

0.69

6.6

J16952

Method detection limit

Median

5.9

5.7

J16953

TOTAL

13

Min.

4.8

5.5

J16954

Max.

7.3

6.6

J16955

7.3

J16956

5.9

J16957

6.3

J16958

Lognormal distribution?

Normal distribution?

5.5

J16959

r-squared is:

0.984

r-squared is:

0.979

6.4

J16960

Recommendations:

Use lognormal distribution.

UCL (Land's method) is

6.3

DATA

ID

95% UCL Calculation Copper

20.9

J16948

Number of samples

Uncensored values

14.2

J16949

Uncensored

13

Mean

15.2

13.0

J16950

Censored

Lognormal mean

15.3

19.9

J16951

Detection limit or PQL

Std. devn.

3.9

13.2

J16952

Method detection limit

Median

14.2

14.3

J16953

TOTAL

13

Min.

10.4

15.0

J16954

Max.

22.3

12.2

J16955

22.3

J16956

10.4

J16957

13.3

J16958

Lognormal distribution?

Normal distribution?

10.5

J16959

r-squared is:

0.941

r-squared is:

0.912

18.8

J16960

Recommendations:

Use lognormal distribution.

UCL (Land's method) is

17.5

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Washington Closure Hanford

Originator L. D. Habel

Project 100-F Field Remediation

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Ecology Software (MTCASat) - Excavation Overburden Results

95% UCL Calculation						
DATA	ID	Lead				
2.6	J16948	Number of samples		Uncensored values		
4.4	J16949	Uncensored	13	Mean		5.3
2.5	J16950	Censored		Lognormal mean		5.4
4.0	J16951	Detection limit or PQL		Std. devn.		2.9
4.4	J16952	Method detection limit		Median		4.4
7.4	J16953	TOTAL	13	Min.		2.5
8.5	J16954			Max.		11.7
3.8	J16955					
11.7	J16956					
5.0	J16957					
2.8	J16958	Lognormal distribution?		Normal distribution?		
3.4	J16959	r-squared is:	0.946	r-squared is:	0.865	
8.8	J16960	Recommendations:				
		Use lognormal distribution.				
		UCL (Land's method) is		7.3		

DATA		95% UCL Calculation				
	ID	Manganese				
230	J16948	Number of samples		Uncensored values		
246	J16949	Uncensored	13	Mean		265
229	J16950	Censored		Lognormal mean		265
273	J16951	Detection limit or PQL		Std. devn.		27.1
302	J16952	Method detection limit		Median		253
253	J16953	TOTAL	13	Min.		229
261	J16954			Max.		310
296	J16955					
290	J16956					
253	J16957					
245	J16958	Lognormal distribution?		Normal distribution?		
252	J16959	r-squared is:	0.944	r-squared is:	0.935	
310	J16960	Recommendations:				
Use lognormal distribution.						
UCL (Land's method) is				279		

95% UCL Calculation						
DATA	ID	Nickel				
8.4	J16948	Number of samples		Uncensored values		
8.5	J16949	Uncensored	13	Mean		9.8
7.9	J16950	Censored		Lognormal mean		9.8
9.6	J16951	Detection limit or PQL		Std. devn.		1.8
10.0	J16952	Method detection limit		Median		9.6
10.5	J16953	TOTAL	13	Min.		7.9
10.8	J16954			Max.		14.7
10.0	J16955					
14.7	J16956					
8.7	J16957					
9.1	J16958	Lognormal distribution?		Normal distribution?		
8.0	J16959	r-squared is:	0.882	r-squared is:	0.811	
10.6	J16960	Recommendations:				
		Reject BOTH lognormal and normal distributions.				
		UCL (based on Z-statistic) is		10.6		

DATA		95% UCL Calculation Vanadium			
35.2	J16948	Number of samples		Uncensored values	
21.3	J16949	Uncensored	13	Mean	37.0
30.0	J16950	Censored		Lognormal mean	37.1
37.7	J16951	Detection limit or PQL		Std. devn.	6.2
40.3	J16952	Method detection limit		Median	37.7
33.9	J16953	TOTAL	13	Min.	21.3
36.4	J16954			Max.	44.7
41.2	J16955				
44.7	J16956				
40.6	J16957				
44.2	J16958	Lognormal distribution?		Normal distribution?	
37.9	J16959	r-squared is:	0.803	r-squared is:	0.887
37.5	J16960	Recommendations:			
Reject BOTH lognormal and normal distributions.					
UCL (based on Z-statistic) is			39.8		

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Originator L. D. Habel *LH*
Project 100-F Field Remediation
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Ecology Software (MTCASat) - Excavation Overburden Results

95% UCL Calculation					
DATA	ID	Zinc			
31.0	J16948	Number of samples		Uncensored values	
28.0	J16949	Uncensored	13	Mean	38.7
28.0	J16950	Censored		Lognormal mean	38.6
35.5	J16951	Detection limit or PQL		Std. devn.	12.0
37.6	J16952	Method detection limit		Median	35.5
73.9	J16953	TOTAL	13	Min.	28.0
42.7	J16954			Max.	73.9
36.8	J16955				
47.9	J16956				
34.2	J16957				
33.3	J16958	Lognormal distribution?		Normal distribution?	
33.3	J16959	r-squared is:	0.852	r-squared is:	0.726
40.8	J16960	Recommendations:			
		Reject BOTH lognormal and normal distributions.			
		UCL (based on Z-statistic) is		44.2	

95% UCL Calculation					
DATA	ID	Bis(2-ethylhexyl) phthalate			
42.0	J16948	Number of samples		Uncensored values	
65.0	J16949	Uncensored	13	Mean	181
82.0	J16950	Censored		Lognormal mean	186
490	J16951	Detection limit or PQL		Std. devn.	125
240	J16952	Method detection limit		Median	140
140	J16953	TOTAL	13	Min.	42.0
140	J16954			Max.	490
130	J16955				
220	J16956				
110	J16957				
110	J16958	Lognormal distribution?		Normal distribution?	
260	J16959	r-squared is:	0.985	r-squared is:	0.872
330	J16960	Recommendations:			
Use lognormal distribution.					
UCL (Land's method) is			295		

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Washington Closure Hanford

Originator L. D. Habel

Project 100-F Field Remediation

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1 Split/Duplicate Analysis, Excavation Shallow Zone

Sample Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Thorium-228			Thorium-232			Gross alpha			Gross beta			Aluminum		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL
SZ-10	J16943	2/14/08	13.0		0.274	0.456		0.084	0.740		0.130	0.669		0.052	0.740		0.130	7.0	U	7.7	19.9		9.0	5980		11.3
Dup. of SZ-10	J16944	2/14/08	7.5		0.591	0.403		0.102	0.543		0.209	0.572		0.070	0.543		0.209	10.7		7.8	22.5		8.8	6570		12.1

6 Analysis:

Duplicate Analysis	TDL	0.5	0.1	0.2	1.0	1	10	15	5
	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No - evaluate difference	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No - evaluate difference	No - evaluate difference	No - evaluate difference	No - evaluate difference	No - evaluate difference	No - evaluate difference	Yes (calc RPD)
	RPD	53%							9%
	Difference >2xTDL?	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	Not applicable

14

Sample Area	Sample Number	Sample Date	Arsenic			Barium			Beryllium			Boron			Cadmium			Calcium			Chromium			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	mg/kg	Q	PQL	mg/kg	Q	PQL
SZ-10	J16943	2/14/08	2.1		1.4	73.6		0.28	0.25		0.14	3.6		1.4	0.14	U	0.14	3050		11.3	8.7		0.57	0.23	U	0.23
Dup. of SZ-10	J16944	2/14/08	3.0		1.5	117		0.30	0.28		0.15	4.2		1.5	0.16		0.15	3940		12.1	12.5		0.61	0.38		0.23

18 Analysis:

Duplicate Analysis	TDL	10	2	0.5	2	0.5	100	1	0.5
	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No - evaluate difference	Yes (continue)	Yes (continue)	No - evaluate difference
	Both >5xTDL?	No - evaluate difference	Yes (calc RPD)	No - evaluate difference	No - evaluate difference		Yes (calc RPD)	Yes (calc RPD)	
	RPD		46%				25%	36%	
	Difference >2xTDL?	No - acceptable	Not applicable	No - acceptable	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable

26

Sample Area	Sample Number	Sample Date	Cobalt			Copper			Iron			Lead			Magnesium			Manganese			Mercury			Nickel		
			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
SZ-10	J16943	2/14/08	6.3		0.57	9.0		0.57	16900		12.7	4.4		0.85	3490		7.1	317		0.11	0.01		0.01	9.5		0.57
Dup. of SZ-10	J16944	2/14/08	7.1		0.61	17.0		0.61	19300		13.6	4.9		0.91	3920		7.6	321		0.12	0.34		0.01	10.7		0.61

30 Analysis:

Duplicate Analysis	TDL	2	1	5	5	75	5	0.2	4
	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	No - evaluate difference	Yes (calc RPD)	Yes (calc RPD)	No - evaluate difference	Yes (calc RPD)	Yes (calc RPD)	No - evaluate difference	No - evaluate difference
	RPD		62%	13%		12%	1%		
	Difference >2xTDL?	No - acceptable	Not applicable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable

38

Sample Area	Sample Number	Sample Date	Potassium			Sodium			Vanadium			Zinc			Aroclor-1260			Bis(2-ethylhexyl)		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
SZ-10	J16943	2/14/08	1290		11.3	142		1.9	37.4		0.40	37.2		1.7	3.9	J	16	38	JB	390
Dup. of SZ-10	J16944	2/14/08	1160		12.1	172		2.0	45.7		0.42	54.4		1.8	16	U	16	32	JB	390

42 Analysis:

Duplicate Analysis	TDL	400	50	2.5	1	17	330
	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No - evaluate difference	No - evaluate difference
	Both >5xTDL?	No - evaluate difference	No - evaluate difference	Yes (calc RPD)	Yes (calc RPD)		
	RPD			20%	38%		
	Difference >2xTDL?	No - acceptable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Americium-241 (GEA)			Barium-133			Cesium-137			Cobalt-60			Europium-152			Europium-154			Europium-155		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
RC-1	J14JT0	2/14/07	0.082	U	0.082				0.094	U	0.094	0.100	U	0.100	0.230	U	0.230	0.350	U	0.350	0.140	U	0.140
RB-1	J14JT1	2/14/07	0.270	U	0.270				0.082	U	0.082	0.093	U	0.093	0.190	U	0.190	0.300	U	0.300	0.200	U	0.200
RB-2	J14JT2	2/14/07	0.098	U	0.098				0.100	U	0.100	0.12	U	0.12	0.260	U	0.260	0.400	U	0.400	0.170	U	0.170
RC-2	J14JT3	2/14/07	0.260	U	0.260				0.071	U	0.071	0.078	U	0.078	0.180	U	0.180	0.240	U	0.240	0.160	U	0.160
RC-3	J14JT4	2/20/07	0.280	U	0.280				0.289		0.10	0.077	U	0.077	0.190	U	0.190	0.270	U	0.270	0.170	U	0.170
RC-4	J13W57	2/21/07	0.110	U	0.110				0.110	U	0.110	0.130	U	0.130	0.280	U	0.280	0.420	U	0.420	0.170	U	0.170
RB-3	J14JT5	2/21/07	0.250	U	0.250				0.078	U	0.078	0.089	U	0.089	0.190	U	0.190	0.310	U	0.310	0.190	U	0.190
OB-1 (a)	J16947	2/6/08	0.106	U	0.106	0.029	U	0.029	0.030	U	0.030	0.031	U	0.031	0.072	U	0.072	0.111	U	0.111	0.085	U	0.085
OB-2	J16948	2/6/08	0.070	U	0.070	0.076	U	0.076	0.066	U	0.066	0.073	U	0.073	0.179	U	0.179	0.214	U	0.214	0.154	U	0.154
OB-3	J16949	2/6/08	0.144	U	0.144	0.025	U	0.025	0.024	U	0.024	0.023	U	0.023	0.063	U	0.063	0.076	U	0.076	0.074	U	0.074
OB-4	J16950	2/6/08	0.045	U	0.045	0.037	U	0.037	0.034	U	0.034	0.037	U	0.037	0.096	U	0.096	0.126	U	0.126	0.074	U	0.074
OB-5	J16951	2/11/08	0.112	U	0.112	0.032	U	0.032	0.038	U	0.038	0.035	U	0.035	0.079	U	0.079	0.122	U	0.122	0.090	U	0.090
OB-6	J16952	2/11/08	0.196	U	0.196	0.039	U	0.039	0.030	U	0.030	0.030	U	0.030	0.077	U	0.077	0.093	U	0.093	0.105	U	0.105
OB-7	J16953	2/11/08	0.048	U	0.048	0.049	U	0.049	0.040	U	0.040	0.041	U	0.041	0.114	U	0.114	0.136	U	0.136	0.091	U	0.091
OB-8	J16954	2/11/08	0.116	U	0.116	0.025	U	0.025	0.024	U	0.024	0.024	U	0.024	0.069	U	0.069	0.078	U	0.078	0.090	U	0.090
OB-9	J16955	2/11/08	0.314	U	0.314	0.040	U	0.040	0.038	U	0.038	0.042	U	0.042	0.105	U	0.105	0.137	U	0.137	0.121	U	0.121
OB-10	J16956	2/11/08	0.114	U	0.114	0.032	U	0.032	0.074		0.038	0.035	U	0.035	0.077	U	0.077	0.107	U	0.107	0.091	U	0.091
OB-11	J16957	2/11/08	0.154	U	0.154	0.032	U	0.032	0.036	U	0.036	0.024	U	0.024	0.065	U	0.065	0.078	U	0.078	0.109	U	0.109
OB-12	J16958	2/11/08	0.036	U	0.036	0.028	U	0.028	0.028	U	0.028	0.028	U	0.028	0.070	U	0.070	0.104	U	0.104	0.085	U	0.085
OB-13	J16959	2/11/08	0.262	U	0.262	0.038	U	0.038	0.032	U	0.032	0.035	U	0.035	0.083	U	0.083	0.130	U	0.130	0.154	U	0.154
OB-14	J16960	2/11/08	0.095	U	0.095	0.022	U	0.022	0.033		0.022	0.020	U	0.020	0.058	U	0.058	0.061	U	0.061	0.073	U	0.073
FS-3	J169W9	2/13/08	0.079	U	0.079	0.078	U	0.078	0.072	U	0.072	0.065	U	0.065	0.170	U	0.170	0.230	U	0.230	0.158	U	0.158
FS-4	J169X0	2/13/08	0.161	U	0.161	0.061	U	0.061	0.057	U	0.057	0.060	U	0.060	0.148	U	0.148	0.193	U	0.193	0.168	U	0.168
FS-5	J169X1	2/13/08	0.190	U	0.190	0.091	U	0.091	0.085	U	0.085	0.090	U	0.090	0.221	U	0.221	0.281	U	0.281	0.192	U	0.192
FS-1	J16945	2/13/08	0.105	U	0.105	0.123	U	0.123	0.123	U	0.123	0.115	U	0.115	0.319	U	0.319	0.354	U	0.354	0.232	U	0.232
FS-2	J16946	2/13/08	0.092	U	0.092	0.063	U	0.063	0.064	U	0.064	0.068	U	0.068	0.162	U	0.162	0.213	U	0.213	0.154	U	0.154
SZ-1	J16934	2/14/08	0.340	U	0.340	0.088	U	0.088	0.084	U	0.084	0.077	U	0.077	0.205	U	0.205	0.330	U	0.330	0.174	U	0.174
SZ-2	J16935	2/14/08	0.140	U	0.140	0.055	U	0.055	0.054	U	0.054	0.050	U	0.050	0.140	U	0.140	0.171	U	0.171	0.145	U	0.145
SZ-3	J16936	2/14/08	0.082	U	0.082	0.080	U	0.080	0.076	U	0.076	0.071	U	0.071	0.170	U	0.170	0.244	U	0.244	0.155	U	0.155
SZ-4	J16937	2/14/08	0.087	U	0.087	0.061	U	0.061	0.065	U	0.065	0.062	U	0.062	0.156	U	0.156	0.164	U	0.164	0.144	U	0.144
SZ-5	J16938	2/14/08	0.091	U	0.091	0.060	U	0.060	0.071	U	0.071	0.063	U	0.063	0.157	U	0.157	0.235	U	0.235	0.151	U	0.151
SZ-6	J16939	2/14/08	0.085	U	0.085	0.090	U	0.090	0.066	U	0.066	0.068	U	0.068	0.194	U	0.194	0.267	U	0.267	0.161	U	0.161
SZ-7	J16940	2/14/08	0.326	U	0.326	0.080	U	0.080	0.073	U	0.073	0.087	U	0.087	0.181	U	0.181	0.251	U	0.251	0.183	U	0.183
SZ-8	J16941	2/14/08	0.168	U	0.168	0.062	U	0.062	0.057	U	0.057	0.053	U	0.053	0.157	U	0.157	0.202	U	0.202	0.166	U	0.166
SZ-9	J16942	2/14/08	0.060	U	0.060	0.066	U	0.066	0.052	U	0.052	0.054	U	0.054	0.137	U	0.137	0.180	U	0.180	0.123	U	0.123
SZ-10	J16943	2/14/08	0.116	U	0.116	0.042	U	0.042	0.035	U	0.035	0.031	U	0.031	0.110	U	0.110	0.121	U	0.121	0.116	U	0.116
Dup. of SZ-10	J16944	2/14/08	0.112	U	0.112	0.058	U	0.058	0.052	U	0.052	0.059	U	0.059	0.140	U	0.140	0.188	U	0.188	0.116	U	0.116

(a) Sample J16947 had TPH concentration in excess of the RAG. The entire pile associated with this sample was removed, so the data is not used in the UCL calculation.

Note: The following abbreviations apply to all Attachment 1 tables. Data qualified with C and/or J are considered acceptable values.

C = method blank contamination (inorganic constituents)

GEA = gamma energy analysis

J = estimated

MDA = minimum detectable activity

PQL = practical quantitation limit

Q = qualifier

U = undetected

Attachment	1	Sheet No.	1 of 21
Originator	L. D. Habel	Date	04/03/08
Checked	H. M. Sulloway	Date	04/03/08
Calc. No.	0100F-CA-V0353	Rev. No.	0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Potassium-40			Radium-226			Radium-228			Silver-108			Thorium-228			Thorium-232			Uranium-235		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
RC-1	J14JT0	2/14/07	12.2		1.1	0.254		0.16	0.600	U	0.600	0.071	U	0.071	0.630		0.140	0.600	U	0.600	0.240	U	0.240
RB-1	J14JT1	2/14/07	11.7		0.970	0.432		0.12	0.714		0.33	0.058	U	0.058	0.598		0.110	0.714		0.33	0.310	U	0.310
RB-2	J14JT2	2/14/07	11.6		1.3	0.428		0.19	0.722		0.55	0.082	U	0.082	0.727		0.170	0.722		0.55	0.280	U	0.280
RC-2	J14JT3	2/14/07	11.2		0.091	0.328		0.15	0.515		0.31	0.054	U	0.054	0.517		0.081	0.515		0.31	0.250	U	0.250
RC-3	J14JT4	2/20/07	11.8		0.620	0.274		0.14	0.738		0.27	0.063	U	0.063	0.459		0.085	0.738		0.27	0.270	U	0.270
RC-4	J13W57	2/21/07	12.5		1.3	0.494		0.22	0.565	U	0.58	0.084	U	0.084	0.762		0.190	0.565	U	0.58	0.340	U	0.340
RB-3	J14JT5	2/21/07	10.9		0.74	0.254		0.11	0.444		0.32	0.056	U	0.056	0.430		0.110	0.444		0.32	0.270	U	0.270
OB-1 (a)	J16947	2/6/08	12.6		0.272	0.453		0.053	0.650		0.118	0.022	U	0.022	0.769		0.052	0.650		0.118	0.112	U	0.112
OB-2	J16948	2/6/08	11.9		0.582	0.385		0.157	0.781		0.308	0.054	U	0.054	0.679		0.130	0.781		0.308	0.265	U	0.265
OB-3	J16949	2/6/08	13.6		0.216	0.466		0.045	0.705		0.109	0.017	U	0.017	0.634		0.031	0.705		0.109	0.109	U	0.109
OB-4	J16950	2/6/08	13.4		0.355	0.442		0.069	0.749		0.148	0.026	U	0.026	0.700		0.044	0.749		0.148	0.139	U	0.139
OB-5	J16951	2/11/08	13.6		0.259	0.485		0.060	0.732		0.132	0.023	U	0.023	0.668		0.038	0.732		0.132	0.117	U	0.117
OB-6	J16952	2/11/08	15.7		0.271	0.541		0.066	0.862		0.132	0.020	U	0.020	0.772		0.039	0.862		0.132	0.145	U	0.145
OB-7	J16953	2/11/08	14.7		0.360	0.428		0.068	0.840		0.135	0.027	U	0.027	0.760		0.046	0.840		0.135	0.166	U	0.166
OB-8	J16954	2/11/08	16.6		0.236	0.538		0.051	0.726		0.116	0.020	U	0.020	0.769		0.034	0.726		0.116	0.131	U	0.131
OB-9	J16955	2/11/08	14.8		0.491	0.573		0.073	0.744		0.163	0.030	U	0.030	0.726		0.052	0.744		0.163	0.179	U	0.179
OB-10	J16956	2/11/08	11.0		0.277	0.707		0.064	0.831		0.133	0.022	U	0.022	0.867		0.038	0.831		0.133	0.116	U	0.116
OB-11	J16957	2/11/08	14.9		0.240	0.487		0.044	0.743		0.088	0.017	U	0.017	0.652		0.032	0.743		0.088	0.120	U	0.120
OB-12	J16958	2/11/08	11.7		0.329	0.394		0.052	0.761		0.120	0.020	U	0.020	0.633		0.034	0.761		0.120	0.109	U	0.109
OB-13	J16959	2/11/08	14.1		0.344	0.480		0.073	0.738		0.155	0.025	U	0.025	0.665		0.046	0.738		0.155	0.151	U	0.151
OB-14	J16960	2/11/08	14.3		0.189	0.590		0.039	0.793		0.082	0.017	U	0.017	0.825		0.032	0.793		0.082	0.109	U	0.109
FS-3	J169W9	2/13/08	10.4		0.797	0.617		0.137	0.821		0.296	0.054	U	0.054	0.604		0.079	0.821		0.296	0.272	U	0.272
FS-4	J169X0	2/13/08	12.0		0.705	0.369		0.124	0.596		0.223	0.048	U	0.048	0.571		0.089	0.596		0.223	0.272	U	0.272
FS-5	J169X1	2/13/08	9.0		0.774	0.282		0.165	0.833		0.349	0.068	U	0.068	0.531		0.106	0.833		0.349	0.278	U	0.278
FS-1	J16945	2/13/08	9.2		1.1	0.316		0.219	0.639		0.484	0.086	U	0.086	0.682		0.193	0.639		0.484	0.428	U	0.428
FS-2	J16946	2/13/08	11.6		0.821	0.644		0.130	0.640		0.268	0.051	U	0.051	0.881		0.130	0.640		0.268	0.266	U	0.266
SZ-1	J16934	2/14/08	13.2		0.804	0.348		0.158	0.477		0.383	0.055	U	0.055	0.533		0.095	0.477		0.383	0.303	U	0.303
SZ-2	J16935	2/14/08	13.3		0.379	0.353		0.123	0.668		0.207	0.043	U	0.043	0.708		0.101	0.668		0.207	0.239	U	0.239
SZ-3	J16936	2/14/08	13.4		0.795	0.415		0.120	0.578		0.332	0.057	U	0.057	0.549		0.085	0.578		0.332	0.272	U	0.272
SZ-4	J16937	2/14/08	13.7		0.525	0.404		0.112	0.472		0.264	0.047	U	0.047	0.733		0.117	0.472		0.264	0.226	U	0.226
SZ-5	J16938	2/14/08	14.3		0.412	0.479		0.128	0.962		0.238	0.049	U	0.049	0.536		0.074	0.962		0.238	0.225	U	0.225
SZ-6	J16939	2/14/08	12.6		0.658	0.540		0.162	0.651		0.358	0.059	U	0.059	0.588		0.084	0.651		0.358	0.289	U	0.289
SZ-7	J16940	2/14/08	11.8		0.757	0.349		0.174	0.953		0.259	0.048	U	0.048	0.571		0.130	0.953		0.259	0.273	U	0.273
SZ-8	J16941	2/14/08	12.8		0.526	0.326		0.103	0.449		0.277	0.047	U	0.047	0.596		0.124	0.449		0.277	0.266	U	0.266
SZ-9	J16942	2/14/08	11.9		0.540	0.441		0.108	0.570		0.235	0.042	U	0.042	0.780		0.097	0.570		0.235	0.217	U	0.217
SZ-10	J16943	2/14/08	13.0		0.274	0.456		0.084	0.740		0.130	0.031	U	0.031	0.669		0.052	0.740		0.130	0.182	U	0.182
Dup. of SZ-10	J16944	2/14/08	7.5		0.591	0.403		0.102	0.543		0.209	0.042	U	0.042	0.572		0.070	0.543		0.209	0.188	U	0.188

Attachment

Originator

Checked

Calc. No.

1

L. D. Habel

H. M. Sulloway

0100F-CA-V0353

Sheet No.

Date

Date

Rev. No.

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04/03/08

04/03/08

0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Uranium-238			Strontium			Gross alpha			Gross beta		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
RC-1	J14JT0	2/14/07	12.0	U	12.0				9.16		5.7	17.0		8.9
RB-1	J14JT1	2/14/07	11.0	U	11.0				7.46		4.9	18.1		5.4
RB-2	J14JT2	2/14/07	12.0	U	12.0				14.3		6.8	19.5		5.7
RC-2	J14JT3	2/14/07	8.2	U	8.2				3.50	U	8.0	16.8		5.6
RC-3	J14JT4	2/20/07	9.2	U	9.2				4.44	U	5.5	18.0		5.5
RC-4	J13W57	2/21/07	16.0	U	16.0				11.4		6.5	23.4		8.6
RB-3	J14JT5	2/21/07	10.0	U	10.0				10.1		4.9	20.4		5.4
OB-1 (a)	J16947	2/6/08	3.8	U	3.8				6.28		6.16	27.3		5.42
OB-2	J16948	2/6/08	8.4	U	8.4				1.47	U	7.41	20.8		6.35
OB-3	J16949	2/6/08	4.3	U	4.3				9.50		4.77	22.7		5.37
OB-4	J16950	2/6/08	4.1	U	4.1				10.3		5.17	18.6		5.54
OB-5	J16951	2/11/08	4.1	U	4.1	0.048	U	0.258	8.33		6.08	14.8		6.21
OB-6	J16952	2/11/08	3.4	U	3.4				10.1		6.29	15.4		6.28
OB-7	J16953	2/11/08	4.4	U	4.4				4.57	U	5.72	15.8		5.33
OB-8	J16954	2/11/08	2.9	U	2.9				15.0		4.99	18.3		5.48
OB-9	J16955	2/11/08	5.2	U	5.2				9.05		5.96	20.6		7.67
OB-10	J16956	2/11/08	3.8	U	3.8				11.4		9.90	17.2		5.86
OB-11	J16957	2/11/08	2.9	U	2.9				14.0		5.07	17.2		5.70
OB-12	J16958	2/11/08	3.2	U	3.2				9.97		7.32	22.1		5.67
OB-13	J16959	2/11/08	4.6	U	4.6				5.63	U	7.54	16.1		5.61
OB-14	J16960	2/11/08	2.6	U	2.6				9.82		6.76	19.3		8.86
FS-3	J169W9	2/13/08	8.1	U	8.1				7.33		6.70	18.4		6.05
FS-4	J169X0	2/13/08	7.8	U	7.8				13.7		7.07	19.1		9.25
FS-5	J169X1	2/13/08	10.7	U	10.7				16.8		5.80	26.2		5.39
FS-1	J16945	2/13/08	13.2	U	13.2				14.4		5.59	21.5		6.21
FS-2	J16946	2/13/08	8.1	U	8.1				21.3		5.07	19.1		5.26
SZ-1	J16934	2/14/08	11.0	U	11.0				5.89	U	6.68	15.3		6.09
SZ-2	J16935	2/14/08	5.8	U	5.8				12.5		6.90	17.3		5.41
SZ-3	J16936	2/14/08	9.4	U	9.4				9.89		7.44	21.6		6.42
SZ-4	J16937	2/14/08	7.8	U	7.8				10.6		5.73	18.8		5.41
SZ-5	J16938	2/14/08	7.4	U	7.4				11.0		5.58	18.9		5.72
SZ-6	J16939	2/14/08	10.2	U	10.2				9.96		6.52	17.5		7.65
SZ-7	J16940	2/14/08	9.8	U	9.8				2.08	U	7.55	19.5		5.81
SZ-8	J16941	2/14/08	7.5	U	7.5				9.88		8.29	14.2		5.80
SZ-9	J16942	2/14/08	6.6	U	6.6				7.48	U	8.82	20.9		5.74
SZ-10	J16943	2/14/08	4.3	U	4.3				6.98	U	7.71	19.9		9.00
Dup. of SZ-10	J16944	2/14/08	6.4	U	6.4				10.7		7.81	22.5		8.77

Attachment

1

Sheet No.

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Originator

L. D. Habel

Date

04/03/08

Checked

H. M. Sulloway

Date

04/03/08

Calc. No.

0100F-CA-V0353

Rev. No.

0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium			Boron			Cadmium		
			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
RC-1	J14JT0	2/14/07	3660	C	6.3	0.75	U	0.75	2.3		0.93	56.5	C	0.03	0.36		0.03	1.6	C	0.57	0.23		0.09
RB-1	J14JT1	2/14/07	5150	C	6.3	0.74	U	0.74	2.7		0.92	48.6	C	0.03	0.31		0.03	2.1	C	0.56	0.11		0.09
RB-2	J14JT2	2/14/07	4890	C	6.2	0.74	U	0.74	1.9		0.91	54.4	C	0.03	0.32		0.03	1.9	C	0.56	0.16		0.09
RC-2	J14JT3	2/14/07	4900		6.3	0.74	U	0.74	0.92	U	0.92	53.1	C	0.03	0.39		0.03	1.3		0.56	0.09	U	0.09
RC-3	J14JT4	2/20/07	3620		6.2	0.73	U	0.73	1.3		0.9	24.1	C	0.03	0.18		0.03	0.56	U	0.55	0.09	U	0.09
RC-4	J13W57	2/21/07	4820		5.4	1.6		0.97	2.5		1.2	51	C	0.06	0.2		0.03	2		1.2	0.09	U	0.09
RB-3	J14JT5	2/21/07	4010		5.4	0.97	U	0.97	2.3		1.2	40.5	C	0.06	0.11		0.03	1.2		1.2	0.09	U	0.09
OB-1	J16947	2/6/08	5300		11.8	0.89	U	0.89	2.9		1.5	126	C	0.3	0.25		0.15	6.3		1.5	0.15	U	0.15
OB-2	J16948	2/6/08	5010		13.3	1.00	U	1.0	2.3		1.7	69.3	C	0.33	0.24		0.17	3.3		1.7	0.17	U	0.17
OB-3	J16949	2/6/08	4580		12.2	0.92	U	0.92	2.0		1.5	107	C	0.31	0.25		0.15	5.1		1.5	0.15	U	0.15
OB-4	J16950	2/6/08	4270		12.6	0.95	U	0.95	2.2		1.6	53.3	C	0.32	0.19		0.16	1.6	U	1.6	0.16	U	0.16
OB-5	J16951	2/11/08	6030		12.3	0.93	U	0.93	2.2		1.5	73.6		0.31	0.20		0.15	2.7		1.5	0.15	U	0.15
OB-6	J16952	2/11/08	6590		11.3	0.85	U	0.85	2.9		1.4	86.9		0.28	0.29		0.14	4.8		1.4	0.14	U	0.14
OB-7	J16953	2/11/08	5720		11.5	0.87	U	0.87	2.9		1.4	52.9		0.29	0.23		0.14	1.4	U	1.4	0.14	U	0.14
OB-8	J16954	2/11/08	5680		11.5	1.0		0.87	1.4	U	1.4	54.6		0.29	0.23		0.14	1.4	U	1.4	0.14	U	0.14
OB-9	J16955	2/11/08	6070		12.3	0.93	U	0.93	3.5		1.5	66.4		0.31	0.28		0.15	1.8		1.5	0.15	U	0.15
OB-10	J16956	2/11/08	9650		11.8	0.89	U	0.89	4.2		1.5	520		0.30	0.61		0.15	48.5		1.5	0.15	U	0.15
OB-11	J16957	2/11/08	4680		11.6	0.87	U	0.87	1.5	U	1.5	53.5		0.29	0.15	U	0.15	1.5	U	1.5	0.15	U	0.15
OB-12	J16958	2/11/08	5040		12.7	0.95	U	0.95	2.2		1.6	80.7		32.0	0.16	U	0.16	8.0		1.6	0.16	U	0.16
OB-13	J16959	2/11/08	4830		12.8	0.96	U	0.96	1.7		1.6	54.7		0.32	0.16	U	0.16	1.6	U	1.6	0.16	U	0.16
OB-14	J16960	2/11/08	6900		11.0	0.83	U	0.83	2.8		1.4	184		0.28	0.20		0.14	14.3		1.4	0.14	U	0.14
FS-3	J169W9	2/13/08	7340		11.0	0.82	U	0.82	2.1		1.4	192	C	0.27	0.20		0.14	23.2		1.4	0.14	U	0.14
FS-4	J169X0	2/13/08	5810		11.4	0.86	U	0.86	2.3		1.4	81.1	C	0.28	0.14	U	0.14	3.7		1.4	0.14	U	0.14
FS-5	J169X1	2/13/08	5510		10.0	0.75	U	0.75	2.3		1.2	82.3	C	0.25	0.13		0.12	3.4		1.2	0.12	U	0.12
FS-1	J16945	2/13/08	4920		10.2	0.77	U	0.77	1.3	U	1.3	66.5	C	0.26	0.13	U	0.13	1.9		1.3	0.13	U	0.13
FS-2	J16946	2/13/08	11900		18.0	0.68	U	0.68	1.3		1.1	329	C	0.22	0.27		0.11	28.6		1.1	0.11	U	0.11
Equip. blank	J16933	2/14/08	69.6		3.4	0.26	U	0.26	0.43	U	0.43	1.8		0.09	0.06		0.04	0.43	U	0.43	0.04	U	0.04
SZ-1	J16934	2/14/08	4900		10.2	0.76	U	0.76	3.3		1.3	62.5		0.25	0.23		0.13	2.4		1.3	0.13	U	0.13
SZ-2	J16935	2/14/08	4990		10.4	0.78	U	0.78	2.7		1.3	56.1		0.26	0.22		0.13	2.6		1.3	0.20		0.13
SZ-3	J16936	2/14/08	4500		10.8	0.81	U	0.81	2.2		1.4	64.7		0.27	0.21		0.14	3.1		1.4	0.14	U	0.14
SZ-4	J16937	2/14/08	5090		11.8	0.89	U	0.89	2.5		1.5	63.0		0.30	0.20		0.15	2.9		1.5	0.15	U	0.15
SZ-5	J16938	2/14/08	4240		9.3	0.70	U	0.70	1.8		1.2	41.6		0.23	0.17		0.12	1.2	U	1.2	0.12	U	0.12
SZ-6	J16939	2/14/08	4570		12.1	0.91	U	0.91	1.5	U	1.5	91.9		0.30	0.26		0.15	6.2		1.5	0.15	U	0.15
SZ-7	J16940	2/14/08	4820		11.1	0.84	U	0.84	1.7		1.4	56.2		0.28	0.27		0.14	1.8		1.4	0.14	U	0.14
SZ-8	J16941	2/14/08	4780		10.3	0.77	U	0.77	2.3		1.3	59.1		0.26	0.25		0.13	1.9		1.3	0.13	U	0.13
SZ-9	J16942	2/14/08	6250		11.3	0.85	U	0.85	2.1		1.4	226		0.28	0.34		0.14	23.7		1.4	0.14	U	0.14
SZ-10	J16943	2/14/08	5980		11.3	0.85	U	0.85	2.1		1.4	73.6		0.28	0.25		0.14	3.6		1.4	0.14	U	0.14
Dup. of SZ-10	J16944	2/14/08	6570		12.1	0.91	U	0.91	3.0		1.5	117		0.30	0.28		0.15	4.2		1.5	0.16		0.15

Attachment	1	Sheet No.	4 of 21
Originator	L. D. Habel	Date	04/03/08
Checked	H. M. Sulloway	Date	04/03/08
Calc. No.	0100F-CA-V0353	Rev. No.	0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Calcium			Chromium			Hexavalent Chromium			Cobalt			Copper			Iron			Lead		
			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
RC-1	J14JT0	2/14/07	2750	C	3.7	5.4	C	0.36	0.29		0.22	5.3		0.15	10.5	C	0.21	13900	C	7.3	3.9		0.48
RB-1	J14JT1	2/14/07	3540	C	3.7	7.7	C	0.36	0.24		0.21	5.4		0.15	12.9	C	0.21	13000	C	7.3	3.3		0.48
RB-2	J14JT2	2/14/07	3630	C	3.7	7.3	C	0.35	0.23		0.21	5.4		0.15	13	C	0.24	15000	C	7.2	3.5		0.47
RC-2	J14JT3	2/14/07	3290	C	3.7	8.9	C	0.36	0.21	U	0.21	5.5		0.15	10.5	C	0.21	16100		7.2	3.6		0.47
RC-3	J14JT4	2/20/07	4730	C	3.6	6.8	C	0.35	0.20	U	0.20	3.7		0.15	9.9		0.20	9380	C	1.8	2.7		0.47
RC-4	J13W57	2/21/07	3860	C	5.5	8.0	C	0.24	0.21	U	0.21	5.4		0.27	11.5		0.36	15300	C	1.2	3.9		0.85
RB-3	J14JT5	2/21/07	5130	C	5.5	7.9	C	0.24	0.21	U	0.21	3.8		0.27	10.6		0.36	10800	C	1.2	2.3		0.85
OB-1	J16947	2/6/08	5760	C	11.8	7.4		0.59	0.22	U	0.22	5.5		0.59	15.8	C	0.59	14800		13.3	12.3		0.89
OB-2	J16948	2/6/08	4050	C	13.3	6.2		0.67	0.53		0.26	5.4		0.67	20.9	C	0.67	13900		15.0	2.6		1.00
OB-3	J16949	2/6/08	5590	C	12.2	5.9		0.61	0.24	U	0.24	4.8		0.61	14.2	C	0.61	9930		13.7	4.4		0.92
OB-4	J16950	2/6/08	3510	C	12.6	5.3		0.63	0.23	U	0.23	5.2		0.63	13.0	C	0.63	13200		14.2	2.5		0.95
OB-5	J16951	2/11/08	4060	C	12.3	8.0		0.62	0.21	U	0.21	6.1		0.62	19.9	C	0.62	15800		13.9	4.0		0.93
OB-6	J16952	2/11/08	4150	C	11.3	8.5		0.57	0.25		0.22	6.6		0.57	13.2	C	0.57	17000		12.7	4.4		0.85
OB-7	J16953	2/11/08	5350	C	11.5	9.0		0.58	0.24		0.21	5.7		0.58	14.3	C	0.58	15400		13.0	7.4		0.87
OB-8	J16954	2/11/08	4790	C	11.5	8.9		0.58	0.28		0.21	5.5		0.58	15.0	C	0.58	15100		13.0	8.5		0.87
OB-9	J16955	2/11/08	3800	C	12.3	7.9		0.62	0.28		0.22	6.6		0.62	12.2	C	0.62	17800		13.9	3.8		0.93
OB-10	J16956	2/11/08	12900	C	11.8	10.6		0.59	0.22	U	0.22	7.3		0.59	22.3	C	0.59	18200		13.3	11.7		0.89
OB-11	J16957	2/11/08	4390	C	11.6	7.1		0.58	0.26		0.21	5.9		0.58	10.4	C	0.58	16100		13.1	5.0		0.87
OB-12	J16958	2/11/08	5240	C	12.7	6.7		0.63	0.21	U	0.21	6.3		0.63	13.3	C	0.63	17300		14.3	2.8		0.95
OB-13	J16959	2/11/08	3560	C	12.8	6.5		0.64	0.29		0.22	5.5		0.64	10.5	C	0.64	16100		14.4	3.4		0.96
OB-14	J16960	2/11/08	9600	C	11.0	8.7		0.55	0.22	U	0.22	6.4		0.55	18.8	C	0.55	16200		12.4	8.8		0.83
FS-3	J169W9	2/13/08	7080	C	11.0	8.8		0.55	0.36		0.21	6.0		0.55	13.4		0.93	17000	C	12.3	4.4		0.82
FS-4	J169X0	2/13/08	4380	C	11.4	8.6		0.57	0.21		0.21	6.2		0.57	12.3		0.66	17200	C	12.8	3.5		0.86
FS-5	J169X1	2/13/08	4300	C	10.0	8.2		0.50	0.21	U	0.21	5.8		0.50	13.1		0.57	15600	C	11.2	3.9		0.75
FS-1	J16945	2/13/08	4130	C	10.2	9.0		0.51	0.30		0.22	4.8		0.51	12.8		0.59	14300	C	11.5	4.1		0.77
FS-2	J16946	2/13/08	8740	C	9.0	7.9		0.45	0.30		0.22	4.7		0.45	26.5		1.0	25200	C	20.2	16.9		0.68
Equip. blank	J16933	2/14/08	31.7		3.4	0.17	U	0.17				0.17	U	0.17	0.17	U	0.17	1790		3.8	0.31		0.26
SZ-1	J16934	2/14/08	7880		10.2	8.3		0.51	0.21	U	0.21	5.5		0.51	14.1		0.51	15100		11.4	6.1		0.76
SZ-2	J16935	2/14/08	4270		10.4	9.2		0.52	0.21	U	0.21	5.8		0.52	15.7		0.52	15600		11.7	7.0		0.78
SZ-3	J16936	2/14/08	4020		10.8	7.0		0.54	0.24		0.21	5.5		0.54	12.4		0.54	14800		12.2	5.5		0.81
SZ-4	J16937	2/14/08	3290		11.8	9.7		0.59	0.22	U	0.22	4.6		0.59	16.0		0.59	13400		13.3	6.6		0.89
SZ-5	J16938	2/14/08	4120		9.3	7.3		0.47	0.23		0.21	4.6		0.47	11.1		0.47	12300		10.5	3.5		0.70
SZ-6	J16939	2/14/08	4830		12.1	6.7		0.61	0.22	U	0.22	6.0		0.61	11.3		0.61	15800		13.6	3.8		0.91
SZ-7	J16940	2/14/08	3970		11.1	7.6		0.56	0.26		0.21	6.7		0.56	11.3		0.56	18300		12.5	4.0		0.84
SZ-8	J16941	2/14/08	3840		10.3	7.7		0.52	0.22	U	0.22	6.7		0.52	10.6		0.52	18600		11.6	3.0		0.77
SZ-9	J16942	2/14/08	7170		11.3	8.7		0.56	0.22	U	0.22	6.2		0.56	15.5		0.56	17100		12.7	5.6		0.85
SZ-10	J16943	2/14/08	3050		11.3	8.7		0.57	0.23	U	0.23	6.3		0.57	9.0		0.57	16900		12.7	4.4		0.85
Dup. of SZ-10	J16944	2/14/08	3940		12.1	12.5		0.61	0.38		0.23	7.1		0.61	17.0		0.61	19300		13.6	4.9		0.91

Attachment1

OriginatorL. D. Habel

CheckedH. M. Sulloway

Calc. No.0100F-CA-V0353

Sheet No.5 of 21

Date04/03/08

Date04/03/08

Rev. No.0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Magnesium			Manganese			Mercury			Molybdenum			Nickel			Potassium			Selenium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
RC-1	J14JT0	2/14/07	2970	C	1.4	268		0.12	0.03		0.02	0.48	U	0.48	7.9		0.66	635		6.3	1.3	U	1.3
RB-1	J14JT1	2/14/07	3460	C	1.4	244		0.12	0.02	U	0.02	0.48	U	0.48	8.7		0.65	946		6.3	1.3	U	1.3
RB-2	J14JT2	2/14/07	3480	C	1.4	232		0.12	0.01	U	0.01	0.47	U	0.47	9.3		0.65	770		6.2	1.3	U	1.3
RC-2	J14JT3	2/14/07	3340	C	1.4	268		0.12	0.02	U	0.02	0.47	U	0.47	9.1		0.65	929	C	6.3	1.3	U	1.3
RC-3	J14JT4	2/20/07	2880	C	1.3	187		0.12	0.02	U	0.02	0.47	U	0.47	7.2		0.64	438		6.2	1.3	U	1.3
RC-4	J13W57	2/21/07	3540		2.2	251		0.06	0.02	U	0.02	0.53		0.39	9.1		0.58	790		14.8	1.3	C	1.1
RB-3	J14JT5	2/21/07	3410		2.2	193		0.06	0.02	U	0.02	0.39	U	0.39	8.5		0.58	469		14.8	1.1	UC	1.1
OB-1	J16947	2/6/08	3780	C	7.4	253	C	0.12	0.01		0.01	0.89	U	0.89	9.5		0.59	806		11.8	1.8	U	1.8
OB-2	J16948	2/6/08	3470	C	8.3	230	C	0.13	0.01	U	0.01	1.30		1.00	8.4		0.67	1030		13.3	2.0	U	2.0
OB-3	J16949	2/6/08	2870	C	7.6	246	C	0.12	0.01	U	0.01	0.92	U	0.92	8.5		0.61	964		12.2	1.8	U	1.8
OB-4	J16950	2/6/08	3010	C	7.9	229	C	0.13	0.01	U	0.01	0.95		0.95	7.9		0.63	971		12.6	1.9	U	1.9
OB-5	J16951	2/11/08	3560		7.7	273	C	0.12	0.01	U	0.01	0.93	U	0.93	9.6		0.62	961		12.3	1.9	U	1.9
OB-6	J16952	2/11/08	3910		7.1	302	C	0.11	0.01	U	0.01	0.85	U	0.85	10.0		0.57	1110		11.3	1.7	U	1.7
OB-7	J16953	2/11/08	3840		7.2	253	C	0.12	0.09		0.01	0.87	U	0.87	10.5		0.58	788		11.5	1.7	U	1.7
OB-8	J16954	2/11/08	3810		7.2	261	C	0.12	0.01	U	0.01	0.87	U	0.87	10.8		0.58	793		11.5	1.7	U	1.7
OB-9	J16955	2/11/08	3800		7.7	296	C	0.12	0.01	U	0.01	0.93	U	0.93	10.0		0.62	1100		12.3	1.9	U	1.9
OB-10	J16956	2/11/08	5890		7.4	290	C	0.12	0.10		0.01	0.89		0.89	14.7		0.56	1010		11.8	1.8	U	1.8
OB-11	J16957	2/11/08	3530		7.3	253	C	0.12	0.01	U	0.01	0.87	U	0.87	8.7		0.58	803		11.6	1.7	U	1.7
OB-12	J16958	2/11/08	4010		7.9	245	C	0.13	0.01	U	0.01	0.95	U	0.95	9.1		0.63	825		12.7	1.9	U	1.9
OB-13	J16959	2/11/08	3340		8.0	252	C	0.13	0.01	U	0.01	0.96	U	0.96	8.0		0.64	1080		12.8	1.9	U	1.9
OB-14	J16960	2/11/08	4080		6.9	310	C	0.11	0.09		0.01	0.83	U	0.83	10.6		0.55	1030		11.0	1.7	U	1.7
FS-3	J169W9	2/13/08	3990	C	6.9	274	C	0.11	0.01	U	0.01	1.1		0.82	9.3		0.55	973		135	1.6	U	1.6
FS-4	J169X0	2/13/08	3740	C	7.1	272	C	0.11	0.01	U	0.01	0.86	U	0.86	9.5		0.57	1040		140	1.7	U	1.7
FS-5	J169X1	2/13/08	3470	C	6.2	273	C	0.10	0.008	U	0.008	0.97		0.75	9.0		0.50	908		123	1.5	U	1.5
FS-1	J16945	2/13/08	3320	C	6.4	214	C	0.10	0.03		0.01	0.77	U	0.77	8.3		0.51	875		126	1.5	U	1.5
FS-2	J16946	2/13/08	3910	C	5.6	203	C	0.09	0.04		0.009	0.86		0.68	9.4		0.45	1220		222	1.4	U	1.4
Equip. blank	J16933	2/14/08	12.6		2.1	20.8		0.03	0.009	U	0.009	0.26	U	0.26	0.17	U	0.17	26.1		3.4	0.51	U	0.51
SZ-1	J16934	2/14/08	3470		6.3	239		0.10	0.04		0.01	0.76	U	0.76	9.0		0.51	786		10.2	1.5	U	1.5
SZ-2	J16935	2/14/08	3660		6.5	248		0.10	0.02		0.009	0.78	U	0.78	9.9		0.52	730		10.4	1.6	U	1.6
SZ-3	J16936	2/14/08	3350		6.8	242		0.11	0.02		0.009	0.81	U	0.81	9.0		0.54	651		10.8	1.6	U	1.6
SZ-4	J16937	2/14/08	3500		7.4	201		0.12	0.15		0.009	0.89	U	0.89	9.2		0.59	668		11.8	1.8	U	1.8
SZ-5	J16938	2/14/08	3140		5.8	208		0.09	0.03		0.008	0.70	U	0.70	8.8		0.47	607		9.3	1.4	U	1.4
SZ-6	J16939	2/14/08	3550		7.6	242		0.12	0.01	U	0.01	0.91	U	0.91	8.7		0.61	918		12.1	1.8	U	1.8
SZ-7	J16940	2/14/08	3710		7.0	284		0.11	0.01	U	0.01	0.84	U	0.84	10.6		0.56	881		11.1	1.7	U	1.7
SZ-8	J16941	2/14/08	3790		6.4	277		0.10	0.009	U	0.009	0.77	U	0.77	9.9		0.52	861		10.3	1.5	U	1.5
SZ-9	J16942	2/14/08	4150		7.0	335		0.11	0.02		0.009	0.85	U	0.85	10.9		0.56	886		11.3	1.7	U	1.7
SZ-10	J16943	2/14/08	3490		7.1	317		0.11	0.01		0.009	0.85	U	0.85	9.5		0.57	1290		11.3	1.7	U	1.7
Dup. of SZ-10	J16944	2/14/08	3920		7.6	321		0.12	0.34		0.01	0.91	U	0.91	10.7		0.61	1160		12.1	1.8	U	1.8

Attachment	1	Sheet No.	6 of 21
Originator	L. D. Habel	Date	04/03/08
Checked	H. M. Sulloway	Date	04/03/08
Calc. No.	0100F-CA-V0353	Rev. No.	0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Silicon			Silver			Sodium			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
RC-1	J14JT0	2/14/07	541	C	1.9	0.15	U	0.15	96.6	C	0.75	32.9		0.18	77.6	C	0.12
RB-1	J14JT1	2/14/07	706	C	1.9	0.15	U	0.15	106	C	0.74	27.9		0.18	29	C	0.12
RB-2	J14JT2	2/14/07	481	C	1.9	0.15	U	0.15	101	C	0.74	36.2		0.18	31.1	C	0.12
RC-2	J14JT3	2/14/07	532	C	1.9	0.15	UC	0.15	65		7.4	39.4		0.18	33	C	0.12
RC-3	J14JT4	2/20/07	429	C	3.2	0.28		0.15	77.6	C	0.73	21.8		0.18	24.7	C	0.64
RC-4	J13W57	2/21/07	431	C	1.8	0.27	U	0.27	98.5	C	9	34.4		0.30	31.9	C	0.09
RB-3	J14JT5	2/21/07	373	C	1.8	0.27	U	0.27	91	C	9.0	24.9		0.30	25.2	C	0.09
OB-1	J16947	2/6/08	2300		11.8	0.30	U	0.30	228	C	5.9	36.7		0.41	49.3		1.8
OB-2	J16948	2/6/08	2540		13.3	0.33	U	0.33	226	C	6.7	35.2		0.47	31.0		2.0
OB-3	J16949	2/6/08	3390		12.2	0.31	U	0.31	196	C	6.1	21.3		0.43	28.0		1.8
OB-4	J16950	2/6/08	2600		12.6	0.32	U	0.32	148	C	6.3	30.0		0.44	28.0		1.9
OB-5	J16951	2/11/08	2840		12.3	0.31	U	0.31	216	C	6.2	37.7		0.43	35.5		1.9
OB-6	J16952	2/11/08	3290		11.3	0.28	U	0.28	229	C	5.7	40.3		0.40	37.6		1.7
OB-7	J16953	2/11/08	2490		11.5	0.29	U	0.29	194	C	5.8	33.9		0.40	73.9		1.7
OB-8	J16954	2/11/08	2820		11.5	0.29	U	0.29	207	C	5.8	36.4		0.40	42.7		1.7
OB-9	J16955	2/11/08	4000		12.3	0.31	U	0.31	223	C	6.2	41.2		0.43	36.8		1.9
OB-10	J16956	2/11/08	1650		11.8	0.30	U	0.30	634	C	5.9	44.7		0.41	47.9		1.8
OB-11	J16957	2/11/08	1550		11.6	0.29	U	0.29	151	C	5.8	40.6		0.41	34.2		1.7
OB-12	J16958	2/11/08	3030		12.7	0.32	U	0.32	246	C	6.3	44.2		0.44	33.3		1.9
OB-13	J16959	2/11/08	2770		12.8	0.32	U	0.32	170	C	6.4	37.9		0.45	33.3		1.9
OB-14	J16960	2/11/08	2360		11.7	0.28	U	0.28	323	C	5.5	37.5		0.39	40.8		1.7
FS-3	J169W9	2/13/08	249		11.0	0.27	U	0.27	284	C	5.5	42.3		0.38	33.1		1.6
FS-4	J169X0	2/13/08	265		11.4	0.28	U	0.28	158	C	5.7	39.8		0.40	33.8		1.7
FS-5	J169X1	2/13/08	236		10.0	0.25	U	0.25	148	C	5.0	37.0		0.35	32.0		1.5
FS-1	J16945	2/13/08	221		10.2	1.2		0.26	117	C	5.1	33.9		0.36	36.0		1.5
FS-2	J16946	2/13/08	288		9.0	0.22	U	0.22	980	C	9.0	30.1		0.32	42.3		1.4
Equip. blank	J16933	2/14/08	51.4		3.4	0.09	U	0.09	10.9		1.7	0.22		0.12	2.5		0.51
SZ-1	J16934	2/14/08	316		10.2	0.25	U	0.25	115		1.7	38.0		0.36	42.9		1.5
SZ-2	J16935	2/14/08	282		10.4	0.26	U	0.26	121		1.7	37.9		0.36	49.3		1.6
SZ-3	J16936	2/14/08	407		10.8	0.27	U	0.27	123		1.8	37.4		0.38	41.2		1.6
SZ-4	J16937	2/14/08	382		11.8	0.30	U	0.30	116		2.0	32.6		0.41	45.7		1.8
SZ-5	J16938	2/14/08	384		9.3	0.23	U	0.23	94.7		1.6	29.2		0.33	28.9		1.4
SZ-6	J16939	2/14/08	488		12.1	0.30	U	0.30	162		2.0	39.9		0.42	34.6		1.8
SZ-7	J16940	2/14/08	337		11.1	0.28	U	0.28	118		1.9	48.1		0.39	36.9		1.7
SZ-8	J16941	2/14/08	344		10.3	0.26	U	0.26	120		1.7	47.5		0.36	36.3		1.5
SZ-9	J16942	2/14/08	479		11.3	0.28	U	0.28	406		1.9	37.5		0.39	38.0		1.7
SZ-10	J16943	2/14/08	322		11.3	0.28	U	0.28	142		1.9	37.4		0.40	37.2		1.7
Dup. of SZ-10	J16944	2/14/08	280		12.1	0.30	U	0.30	172		2.0	45.7		0.42	54.4		1.8

Attachment	I	Sheet No.	7 of 21
Originator	L. D. Habel	Date	04/03/08
Checked	H. M. Sulloway	Date	04/03/08
Calc. No.	0100F-CA-V0353	Rev. No.	0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Aroclor-1016			Aroclor-1221			Aroclor-1232			Aroclor-1242			Aroclor-1248			Aroclor-1254			Aroclor-1260		
			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
RC-1	J14JT0	2/14/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
RB-1	J14JT1	2/14/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
RB-2	J14JT2	2/14/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
RC-2	J14JT3	2/14/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
RC-3	J14JT4	2/20/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
RC-4	J13W57	2/21/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
RB-3	J14JT5	2/21/07	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
OB-1	J16947	2/6/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	45		14	41		14
OB-2	J16948	2/6/08	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17	17	U	17
OB-3	J16949	2/6/08	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16
OB-4	J16950	2/6/08	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16
OB-5	J16951	2/11/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
OB-6	J16952	2/11/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
OB-7	J16953	2/11/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
OB-8	J16954	2/11/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
OB-9	J16955	2/11/08	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15
OB-10	J16956	2/11/08	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	24		15
OB-11	J16957	2/11/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
OB-12	J16958	2/11/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
OB-13	J16959	2/11/08	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15.0	U	15
OB-14	J16960	2/11/08	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	180		15
FS-3	J169W9	2/13/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
FS-4	J169X0	2/13/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
FS-5	J169X1	2/13/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
FS-1	J16945	2/13/08	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15
FS-2	J16946	2/13/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	92		14	60		14
SZ-1	J16934	2/14/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14.0	U	14
SZ-2	J16935	2/14/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
SZ-3	J16936	2/14/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
SZ-4	J16937	2/14/08	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	4	J	15	15	U	15
SZ-5	J16938	2/14/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
SZ-6	J16939	2/14/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	19		14	9	J	14
SZ-7	J16940	2/14/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14.0	U	14
SZ-8	J16941	2/14/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14.0	U	14
SZ-9	J16942	2/14/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	5	J	14	17		14
SZ-10	J16943	2/14/08	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16	4	J	16
Dup. of SZ-10	J16944	2/14/08	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16	16	U	16
Equip. blank	J16933	2/14/08																					

Attachment	1	Sheet No.	8 of 21
Originator	L. D. Habel	Date	04/03/08
Checked	H. M. Sulloway <i>HMS</i>	Date	04/03/08
Calc. No.	0100F-CA-V0353	Rev. No.	0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	TPH			Aldrin			Alpha-BHC			alpha-Chlordane			beta-1,2,3,4,5,6-			Delta-BHC			Dichlorodiphenyldichloroe		
			mg/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
RC-1	J14JT0	2/14/07	143	U	143																		
RB-1	J14JT1	2/14/07	143	U	143																		
RB-2	J14JT2	2/14/07	139	U	139																		
RC-2	J14JT3	2/14/07	139	U	139																		
RC-3	J14JT4	2/20/07	135	U	135																		
RC-4	J13W57	2/21/07	141	U	141																		
RB-3	J14JT5	2/21/07	141	U	141																		
OB-1	J16947	2/6/08	4930	D	714																		
OB-2	J16948	2/6/08	174	U	174																		
OB-3	J16949	2/6/08	162	U	162																		
OB-4	J16950	2/6/08	156	U	156																		
OB-5	J16951	2/11/08	141	U	141																		
OB-6	J16952	2/11/08	142	U	142																		
OB-7	J16953	2/11/08	138	U	138																		
OB-8	J16954	2/11/08	142	U	142																		
OB-9	J16955	2/11/08	146	U	146																		
OB-10	J16956	2/11/08	148	U	148																		
OB-11	J16957	2/11/08	140	U	140																		
OB-12	J16958	2/11/08	141	U	141																		
OB-13	J16959	2/11/08	147	U	147																		
OB-14	J16960	2/11/08	145	U	145																		
FS-3	J169W9	2/13/08	138	U	138																		
FS-4	J169X0	2/13/08	142	U	142																		
FS-5	J169X1	2/13/08	140	U	140																		
FS-1	J16945	2/13/08	149	U	149																		
FS-2	J16946	2/13/08	142	U	142																		
SZ-1	J16934	2/14/08	138	U	138																		
SZ-2	J16935	2/14/08	137	U	137																		
SZ-3	J16936	2/14/08	141	U	141																		
SZ-4	J16937	2/14/08	148	U	148																		
SZ-5	J16938	2/14/08	140	U	140																		
SZ-6	J16939	2/14/08	143	U	143																		
SZ-7	J16940	2/14/08	140	U	140																		
SZ-8	J16941	2/14/08	144	U	144																		
SZ-9	J16942	2/14/08	144	U	144																		
SZ-10	J16943	2/14/08	155	U	155																		
Dup. of SZ-10	J16944	2/14/08	155	U	155																		
Equip. blank	J16933	2/14/08																					

Attachment	1	Sheet No.	9 of 21
Originator	L. D. Habel	Date	04/03/08
Checked	H. M. Sulloway	Date	04/03/08
Calc. No.	0100F-CA-V0353	Rev. No.	0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Dichlorodiphenyldichloroe			Dichlorodiphenyltrichloro			Dieldrin			Endosulfan I			Endosulfan II			Endosulfan sulfate			Endrin		
			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
RC-1	J14JT0	2/14/07																					
RB-1	J14JT1	2/14/07																					
RB-2	J14JT2	2/14/07																					
RC-2	J14JT3	2/14/07																					
RC-3	J14JT4	2/20/07																					
RC-4	J13W57	2/21/07																					
RB-3	J14JT5	2/21/07																					
OB-1	J16947	2/6/08																					
OB-2	J16948	2/6/08																					
OB-3	J16949	2/6/08																					
OB-4	J16950	2/6/08																					
OB-5	J16951	2/11/08																					
OB-6	J16952	2/11/08																					
OB-7	J16953	2/11/08																					
OB-8	J16954	2/11/08																					
OB-9	J16955	2/11/08																					
OB-10	J16956	2/11/08																					
OB-11	J16957	2/11/08																					
OB-12	J16958	2/11/08																					
OB-13	J16959	2/11/08																					
OB-14	J16960	2/11/08																					
FS-3	J169W9	2/13/08																					
FS-4	J169X0	2/13/08																					
FS-5	J169X1	2/13/08																					
FS-1	J16945	2/13/08																					
FS-2	J16946	2/13/08																					
SZ-1	J16934	2/14/08																					
SZ-2	J16935	2/14/08																					
SZ-3	J16936	2/14/08																					
SZ-4	J16937	2/14/08																					
SZ-5	J16938	2/14/08																					
SZ-6	J16939	2/14/08																					
SZ-7	J16940	2/14/08																					
SZ-8	J16941	2/14/08																					
SZ-9	J16942	2/14/08																					
SZ-10	J16943	2/14/08																					
Dup. of SZ-10	J16944	2/14/08																					
Equip. blank	J16933	2/14/08																					

Attachment

Originator

Checked

Calc. No.

1

L. D. Habel

H. M. Sulloway

0100F-CA-V0353

Sheet No.

Date

Date

Rev. No.

10 of 21

04/03/08

04/03/08

0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Endrin aldehyde			Endrin ketone			Gamma-BHC (Lindane)			gamma-Chlordane			Heptachlor			Heptachlor epoxide			Methoxychlor		
			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
RC-1	J14JT0	2/14/07																					
RB-1	J14JT1	2/14/07																					
RB-2	J14JT2	2/14/07																					
RC-2	J14JT3	2/14/07																					
RC-3	J14JT4	2/20/07																					
RC-4	J13W57	2/21/07																					
RB-3	J14JT5	2/21/07																					
OB-1	J16947	2/6/08																					
OB-2	J16948	2/6/08																					
OB-3	J16949	2/6/08																					
OB-4	J16950	2/6/08																					
OB-5	J16951	2/11/08																					
OB-6	J16952	2/11/08																					
OB-7	J16953	2/11/08																					
OB-8	J16954	2/11/08																					
OB-9	J16955	2/11/08																					
OB-10	J16956	2/11/08																					
OB-11	J16957	2/11/08																					
OB-12	J16958	2/11/08																					
OB-13	J16959	2/11/08																					
OB-14	J16960	2/11/08																					
FS-3	J169W9	2/13/08																					
FS-4	J169X0	2/13/08																					
FS-5	J169X1	2/13/08																					
FS-1	J16945	2/13/08																					
FS-2	J16946	2/13/08																					
SZ-1	J16934	2/14/08																					
SZ-2	J16935	2/14/08																					
SZ-3	J16936	2/14/08																					
SZ-4	J16937	2/14/08																					
SZ-5	J16938	2/14/08																					
SZ-6	J16939	2/14/08																					
SZ-7	J16940	2/14/08																					
SZ-8	J16941	2/14/08																					
SZ-9	J16942	2/14/08																					
SZ-10	J16943	2/14/08																					
Dup. of SZ-10	J16944	2/14/08																					
Equip. blank	J16933	2/14/08																					

Attachment	I	Sheet No.	11 of 21
Originator	L. D. Habel	Date	04/03/08
Checked	H. M. Sulloway	Date	04/03/08
Calc. No.	0100F-CA-V0353	Rev. No.	0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Toxaphene			1,2,4-Trichlorobenzene			1,2-Dichlorobenzene			1,3-Dichlorobenzene			1,4-Dichlorobenzene			2,4,5-Trichlorophenol			2,4,6-Trichlorophenol		
			ug/Kg	Q	PQL	#N/A	Q	PQL	#N/A	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-1	J14JT0	2/14/07				360	U	360	360	U	360	360	U	360	360	U	360	900	U	900	360	U	360
RB-1	J14JT1	2/14/07				360	U	360	360	U	360	360	U	360	360	U	360	890	U	890	360	U	360
RB-2	J14JT2	2/14/07				350	U	350	350	U	350	350	U	350	350	U	350	870	U	870	350	U	350
RC-2	J14JT3	2/14/07				350	U	350	350	U	350	350	U	350	350	U	350	870	U	870	350	U	350
RC-3	J14JT4	2/20/07				340	U	340	340	U	340	340	U	340	340	U	340	850	U	850	340	U	340
RC-4	J13W57	2/21/07				350	U	350	350	U	350	350	U	350	350	U	350	880	U	880	350	U	350
RB-3	J14JT5	2/21/07				350	U	350	350	U	350	350	U	350	350	U	350	880	U	880	350	U	350
OB-1	J16947	2/6/08				360	U	360	360	U	360	360	U	360	360	U	360	900	U	900	360	U	360
OB-2	J16948	2/6/08				440	U	440	440	U	440	440	U	440	440	U	440	1100	U	1100	440	U	440
OB-3	J16949	2/6/08				410	U	410	410	U	410	410	U	410	410	U	410	1000	U	1000	410	U	410
OB-4	J16950	2/6/08				390	U	390	390	U	390	390	U	390	390	U	390	980	U	980	390	U	390
OB-5	J16951	2/11/08				2900	UD	2900	2900	UD	2900	2900	UD	2900	2900	UD	2900	7100	UD	7100	2900	UD	2900
OB-6	J16952	2/11/08				360	U	360	360	U	360	360	U	360	360	U	360	900	U	900	360	U	360
OB-7	J16953	2/11/08				350	U	350	350	U	350	350	U	350	350	U	350	870	U	870	350	U	350
OB-8	J16954	2/11/08				360	U	360	360	U	360	360	U	360	360	U	360	890	U	890	360	U	360
OB-9	J16955	2/11/08				370	U	370	370	U	370	370	U	370	370	U	370	920	U	920	370	U	370
OB-10	J16956	2/11/08				370	U	370	370	U	370	370	U	370	370	U	370	930	U	930	370	U	370
OB-11	J16957	2/11/08				350	U	350	350	U	350	350	U	350	350	U	350	880	U	880	350	U	350
OB-12	J16958	2/11/08				360	U	360	360	U	360	360	U	360	360	U	360	890	U	890	360	U	360
OB-13	J16959	2/11/08				370	U	370	370	U	370	370	U	370	370	U	370	930	U	930	370	U	370
OB-14	J16960	2/11/08				360	U	360	360	U	360	360	U	360	360	U	360	910	U	910	360	U	360
FS-3	J169W9	2/13/08				340	U	340	340	U	340	340	U	340	340	U	340	860	U	860	340	U	340
FS-4	J169X0	2/13/08				350	U	350	350	U	350	350	U	350	350	U	350	890	U	890	350	U	350
FS-5	J169X1	2/13/08				350	U	350	350	U	350	350	U	350	350	U	350	870	U	870	350	U	350
FS-1	J16945	2/13/08				370	U	370	370	U	370	370	U	370	370	U	370	930	U	930	370	U	370
FS-2	J16946	2/13/08				360	U	360	360	U	360	360	U	360	360	U	360	890	U	890	360	U	360
SZ-1	J16934	2/14/08				350	U	350	350	U	350	350	U	350	350	U	350	870	U	870	350	U	350
SZ-2	J16935	2/14/08				340	U	340	340	U	340	340	U	340	340	U	340	860	U	860	340	U	340
SZ-3	J16936	2/14/08				350	U	350	350	U	350	350	U	350	350	U	350	890	U	890	350	U	350
SZ-4	J16937	2/14/08				370	U	370	370	U	370	370	U	370	370	U	370	930	U	930	370	U	370
SZ-5	J16938	2/14/08				350	U	350	350	U	350	350	U	350	350	U	350	890	U	890	350	U	350
SZ-6	J16939	2/14/08				360	U	360	360	U	360	360	U	360	360	U	360	900	U	900	360	U	360
SZ-7	J16940	2/14/08				350	U	350	350	U	350	350	U	350	350	U	350	880	U	880	350	U	350
SZ-8	J16941	2/14/08				360	U	360	360	U	360	360	U	360	360	U	360	900	U	900	360	U	360
SZ-9	J16942	2/14/08				360	U	360	360	U	360	360	U	360	360	U	360	900	U	900	360	U	360
SZ-10	J16943	2/14/08				390	U	390	390	U	390	390	U	390	390	U	390	970	U	970	390	U	390
Dup. of SZ-10	J16944	2/14/08				390	U	390	390	U	390	390	U	390	390	U	390	980	U	980	390	U	390
Equip. blank	J16933	2/14/08				340	U	340	340	U	340	340	U	340	340	U	340	840	U	840	340	U	340

Attachment	1	Sheet No.	12 of 21
Originator	L. D. Habel	Date	04/03/08
Checked	H. M. Sulloway	Date	04/03/08
Calc. No.	0100F-CA-V0353	Rev. No.	0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	2,4-Dichlorophenol			2,4-Dimethylphenol			2,4-Dinitrophenol			2,4-Dinitrotoluene			2,6-Dinitrotoluene			2-Chloronaphthalene			2-Chlorophenol		
			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
RC-1	J14JT0	2/14/07	360	U	360	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360	360	U	360
RB-1	J14JT1	2/14/07	360	U	360	360	U	360	890	U	890	360	U	360	360	U	360	360	U	360	360	U	360
RB-2	J14JT2	2/14/07	350	U	350	350	U	350	870	U	870	350	U	350	350	U	350	350	U	350	350	U	350
RC-2	J14JT3	2/14/07	350	U	350	350	U	350	870	U	870	350	U	350	350	U	350	350	U	350	350	U	350
RC-3	J14JT4	2/20/07	340	U	340	340	U	340	850	U	850	340	U	340	340	U	340	340	U	340	340	U	340
RC-4	J13W57	2/21/07	350	U	350	350	U	350	880	U	880	350	U	350	350	U	350	350	U	350	350	U	350
RB-3	J14JT5	2/21/07	350	U	350	350	U	350	880	U	880	350	U	350	350	U	350	350	U	350	350	U	350
OB-1	J16947	2/6/08	360	U	360	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360	360	U	360
OB-2	J16948	2/6/08	440	U	440	440	U	440	1100	U	1100	440	U	440	440	U	440	440	U	440	440	U	440
OB-3	J16949	2/6/08	410	U	410	410	U	410	1000	U	1000	410	U	410	410	U	410	410	U	410	410	U	410
OB-4	J16950	2/6/08	390	U	390	390	U	390	980	U	980	390	U	390	390	U	390	390	U	390	390	U	390
OB-5	J16951	2/11/08	2900	UD	2900	2900	UD	2900	7100	UD	7100	2900	UD	2900	2900	UD	2900	2900	UD	2900	2900	UD	2900
OB-6	J16952	2/11/08	360	U	360	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360	360	U	360
OB-7	J16953	2/11/08	350	U	350	350	U	350	870	U	870	350	U	350	350	U	350	350	U	350	350	U	350
OB-8	J16954	2/11/08	360	U	360	360	U	360	890	U	890	360	U	360	360	U	360	360	U	360	360	U	360
OB-9	J16955	2/11/08	370	U	370	370	U	370	920	U	920	370	U	370	370	U	370	370	U	370	370	U	370
OB-10	J16956	2/11/08	370	U	370	370	U	370	930	U	930	370	U	370	370	U	370	370	U	370	370	U	370
OB-11	J16957	2/11/08	350	U	350	350	U	350	880	U	880	350	U	350	350	U	350	350	U	350	350	U	350
OB-12	J16958	2/11/08	360	U	360	360	U	360	890	U	890	360	U	360	360	U	360	360	U	360	360	U	360
OB-13	J16959	2/11/08	370	U	370	370	U	370	930	U	930	370	U	370	370	U	370	370	U	370	370	U	370
OB-14	J16960	2/11/08	360	U	360	360	U	360	910	U	910	360	U	360	360	U	360	360	U	360	360	U	360
FS-3	J169W9	2/13/08	340	U	340	340	U	340	860	U	860	340	U	340	340	U	340	340	U	340	340	U	340
FS-4	J169X0	2/13/08	350	U	350	350	U	350	890	U	890	350	U	350	350	U	350	350	U	350	350	U	350
FS-5	J169X1	2/13/08	350	U	350	350	U	350	870	U	870	350	U	350	350	U	350	350	U	350	350	U	350
FS-1	J16945	2/13/08	370	U	370	370	U	370	930	U	930	370	U	370	370	U	370	370	U	370	370	U	370
FS-2	J16946	2/13/08	360	U	360	360	U	360	890	U	890	360	U	360	360	U	360	360	U	360	360	U	360
SZ-1	J16934	2/14/08	350	U	350	350	U	350	870	U	870	350	U	350	350	U	350	350	U	350	350	U	350
SZ-2	J16935	2/14/08	340	U	340	340	U	340	860	U	860	340	U	340	340	U	340	340	U	340	340	U	340
SZ-3	J16936	2/14/08	350	U	350	350	U	350	890	U	890	350	U	350	350	U	350	350	U	350	350	U	350
SZ-4	J16937	2/14/08	370	U	370	370	U	370	930	U	930	370	U	370	370	U	370	370	U	370	370	U	370
SZ-5	J16938	2/14/08	350	U	350	350	U	350	890	U	890	350	U	350	350	U	350	350	U	350	350	U	350
SZ-6	J16939	2/14/08	360	U	360	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360	360	U	360
SZ-7	J16940	2/14/08	350	U	350	350	U	350	880	U	880	350	U	350	350	U	350	350	U	350	350	U	350
SZ-8	J16941	2/14/08	360	U	360	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360	360	U	360
SZ-9	J16942	2/14/08	360	U	360	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360	360	U	360
SZ-10	J16943	2/14/08	390	U	390	390	U	390	970	U	970	390	U	390	390	U	390	390	U	390	390	U	390
Dup. of SZ-10	J16944	2/14/08	390	U	390	390	U	390	980	U	980	390	U	390	390	U	390	390	U	390	390	U	390
Equip. blank	J16933	2/14/08	340	U	340	340	U	340	840	U	840	340	U	340	340	U	340	340	U	340	340	U	340

Attachment	1	Sheet No.	13 of 21
Originator	L. D. Habel	Date	04/03/08
Checked	H. M. Sulloway	Date	04/03/08
Calc. No.	0100F-CA-V0353	Rev. No.	0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	2-Methylnaphthalene			2-Methylphenol (cresol, o-)			2-Nitroaniline			2-Nitrophenol			3+4 Methylphenol (cresol,			3,3'-Dichlorobenzidine			3-Nitroaniline		
			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
RC-1	J14JT0	2/14/07	360	U	360	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360	900	U	900
RB-1	J14JT1	2/14/07	360	U	360	360	U	360	890	U	890	360	U	360	360	U	360	360	U	360	890	U	890
RB-2	J14JT2	2/14/07	350	U	350	350	U	350	870	U	870	350	U	350	350	U	350	350	U	350	870	U	870
RC-2	J14JT3	2/14/07	350	U	350	350	U	350	870	U	870	350	U	350	350	U	350	350	U	350	870	U	870
RC-3	J14JT4	2/20/07	340	U	340	340	U	340	850	U	850	340	U	340	340	U	340	340	U	340	850	U	850
RC-4	J13W57	2/21/07	350	U	350	350	U	350	880	U	880	350	U	350	350	U	350	350	U	350	880	U	880
RB-3	J14JT5	2/21/07	350	U	350	350	U	350	880	U	880	350	U	350	350	U	350	350	U	350	880	U	880
OB-1	J16947	2/6/08	360	U	360	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360	900	U	900
OB-2	J16948	2/6/08	440	U	440	440	U	440	1100	U	1100	440	U	440	440	U	440	440	U	440	1100	U	1100
OB-3	J16949	2/6/08	410	U	410	410	U	410	1000	U	1000	410	U	410	410	U	410	410	U	410	1000	U	1000
OB-4	J16950	2/6/08	390	U	390	390	U	390	980	U	980	390	U	390	390	U	390	390	U	390	980	U	980
OB-5	J16951	2/11/08	2900	UD	2900	2900	UD	2900	7100	UD	7100	2900	UD	2900	2900	UD	2900	2900	UD	2900	7100	UD	7100
OB-6	J16952	2/11/08	360	U	360	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360	900	U	900
OB-7	J16953	2/11/08	350	U	350	350	U	350	870	U	870	350	U	350	350	U	350	350	U	350	870	U	870
OB-8	J16954	2/11/08	360	U	360	360	U	360	890	U	890	360	U	360	360	U	360	360	U	360	890	U	890
OB-9	J16955	2/11/08	370	U	370	370	U	370	920	U	920	370	U	370	370	U	370	370	U	370	920	U	920
OB-10	J16956	2/11/08	370	U	370	370	U	370	930	U	930	370	U	370	370	U	370	370	U	370	930	U	930
OB-11	J16957	2/11/08	350	U	350	350	U	350	880	U	880	350	U	350	350	U	350	350	U	350	880	U	880
OB-12	J16958	2/11/08	360	U	360	360	U	360	890	U	890	360	U	360	360	U	360	360	U	360	890	U	890
OB-13	J16959	2/11/08	370	U	370	370	U	370	930	U	930	370	U	370	370	U	370	370	U	370	930	U	930
OB-14	J16960	2/11/08	27	J	360	360	U	360	910	U	910	360	U	360	360	U	360	360	U	360	910	U	910
FS-3	J169W9	2/13/08	340	U	340	340	U	340	860	U	860	340	U	340	340	U	340	340	U	340	860	U	860
FS-4	J169X0	2/13/08	350	U	350	350	U	350	890	U	890	350	U	350	350	U	350	350	U	350	890	U	890
FS-5	J169X1	2/13/08	350	U	350	350	U	350	870	U	870	350	U	350	350	U	350	350	U	350	870	U	870
FS-1	J16945	2/13/08	370	U	370	370	U	370	930	U	930	370	U	370	370	U	370	370	U	370	930	U	930
FS-2	J16946	2/13/08	360	U	360	360	U	360	890	U	890	360	U	360	360	U	360	360	U	360	890	U	890
SZ-1	J16934	2/14/08	350	U	350	350	U	350	870	U	870	350	U	350	350	U	350	350	U	350	870	U	870
SZ-2	J16935	2/14/08	340	U	340	340	U	340	860	U	860	340	U	340	340	U	340	340	U	340	860	U	860
SZ-3	J16936	2/14/08	350	U	350	350	U	350	890	U	890	350	U	350	350	U	350	350	U	350	890	U	890
SZ-4	J16937	2/14/08	370	U	370	370	U	370	930	U	930	370	U	370	370	U	370	370	U	370	930	U	930
SZ-5	J16938	2/14/08	350	U	350	350	U	350	890	U	890	350	U	350	350	U	350	350	U	350	890	U	890
SZ-6	J16939	2/14/08	360	U	360	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360	900	U	900
SZ-7	J16940	2/14/08	350	U	350	350	U	350	880	U	880	350	U	350	350	U	350	350	U	350	880	U	880
SZ-8	J16941	2/14/08	360	U	360	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360	900	U	900
SZ-9	J16942	2/14/08	360	U	360	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360	900	U	900
SZ-10	J16943	2/14/08	390	U	390	390	U	390	970	U	970	390	U	390	390	U	390	390	U	390	970	U	970
Dup. of SZ-10	J16944	2/14/08	390	U	390	390	U	390	980	U	980	390	U	390	390	U	390	390	U	390	980	U	980
Equip. blank	J16933	2/14/08	340	U	340	340	U	340	840	U	840	340	U	340	340	U	340	340	U	340	840	U	840

Attachment	1	Sheet No.	14 of 21
Originator	L. D. Habel	Date	04/03/08
Checked	H. M. Sulloway	Date	04/03/08
Calc. No.	0100F-CA-V0353	Rev. No.	0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	4,6-Dinitro-2-methylphenol			4-Bromophenylphenyl ether			4-Chloro-3-methylphenol			4-Chloroaniline			4-Chlorophenylphenyl ether			4-Nitroaniline			4-Nitrophenol		
			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
RC-1	J14JT0	2/14/07	900	U	900	360	U	360	360	U	360	360	U	360	360	U	360	900	U	900	900	U	900
RB-1	J14JT1	2/14/07	890	U	890	360	U	360	360	U	360	360	U	360	360	U	360	890	U	890	890	U	890
RB-2	J14JT2	2/14/07	870	U	870	350	U	350	350	U	350	350	U	350	350	U	350	870	U	870	870	U	870
RC-2	J14JT3	2/14/07	870	U	870	350	U	350	350	U	350	350	U	350	350	U	350	870	U	870	870	U	870
RC-3	J14JT4	2/20/07	850	U	850	340	U	340	340	U	340	340	U	340	340	U	340	850	U	850	850	U	850
RC-4	J13W57	2/21/07	880	U	880	350	U	350	350	U	350	350	U	350	350	U	350	880	U	880	880	U	880
RB-3	J14JT5	2/21/07	880	U	880	350	U	350	350	U	350	350	U	350	350	U	350	880	U	880	880	U	880
OB-1	J16947	2/6/08	900	U	900	360	U	360	360	U	360	360	U	360	360	U	360	900	U	900	900	U	900
OB-2	J16948	2/6/08	1100	U	1100	440	U	440	440	U	440	440	U	440	440	U	440	1100	U	1100	1100	U	1100
OB-3	J16949	2/6/08	1000	U	1000	410	U	410	410	U	410	410	U	410	410	U	410	1000	U	1000	1000	U	1000
OB-4	J16950	2/6/08	980	U	980	390	U	390	390	U	390	390	U	390	390	U	390	980	U	980	980	U	980
OB-5	J16951	2/11/08	7100	UD	7100	2900	UD	2900	2900	UD	2900	2900	UD	2900	2900	UD	2900	7100	UD	7100	7100	UD	7100
OB-6	J16952	2/11/08	900	U	900	360	U	360	360	U	360	360	U	360	360	U	360	900	U	900	900	U	900
OB-7	J16953	2/11/08	870	U	870	350	U	350	350	U	350	350	U	350	350	U	350	870	U	870	870	U	870
OB-8	J16954	2/11/08	890	U	890	360	U	360	360	U	360	360	U	360	360	U	360	890	U	890	890	U	890
OB-9	J16955	2/11/08	920	U	920	370	U	370	370	U	370	370	U	370	370	U	370	920	U	920	920	U	920
OB-10	J16956	2/11/08	930	U	930	370	U	370	370	U	370	370	U	370	370	U	370	930	U	930	930	U	930
OB-11	J16957	2/11/08	880	U	880	350	U	350	350	U	350	350	U	350	350	U	350	880	U	880	880	U	880
OB-12	J16958	2/11/08	890	U	890	360	U	360	360	U	360	360	U	360	360	U	360	890	U	890	890	U	890
OB-13	J16959	2/11/08	930	U	930	370	U	370	370	U	370	370	U	370	370	U	370	930	U	930	930	U	930
OB-14	J16960	2/11/08	910	U	910	360	U	360	360	U	360	360	U	360	360	U	360	910	U	910	910	U	910
FS-3	J169W9	2/13/08	860	U	860	340	U	340	340	U	340	340	U	340	340	U	340	860	U	860	860	U	860
FS-4	J169X0	2/13/08	890	U	890	350	U	350	350	U	350	350	U	350	350	U	350	890	U	890	890	U	890
FS-5	J169X1	2/13/08	870	U	870	350	U	350	350	U	350	350	U	350	350	U	350	870	U	870	870	U	870
FS-1	J16945	2/13/08	930	U	930	370	U	370	370	U	370	370	U	370	370	U	370	930	U	930	930	U	930
FS-2	J16946	2/13/08	890	U	890	360	U	360	360	U	360	360	U	360	360	U	360	890	U	890	890	U	890
SZ-1	J16934	2/14/08	870	U	870	350	U	350	350	U	350	350	U	350	350	U	350	870	U	870	870	U	870
SZ-2	J16935	2/14/08	860	U	860	340	U	340	340	U	340	340	U	340	340	U	340	860	U	860	860	U	860
SZ-3	J16936	2/14/08	890	U	890	350	U	350	350	U	350	350	U	350	350	U	350	890	U	890	890	U	890
SZ-4	J16937	2/14/08	930	U	930	370	U	370	370	U	370	370	U	370	370	U	370	930	U	930	930	U	930
SZ-5	J16938	2/14/08	890	U	890	350	U	350	350	U	350	350	U	350	350	U	350	890	U	890	890	U	890
SZ-6	J16939	2/14/08	900	U	900	360	U	360	360	U	360	360	U	360	360	U	360	900	U	900	900	U	900
SZ-7	J16940	2/14/08	880	U	880	350	U	350	350	U	350	350	U	350	350	U	350	880	U	880	880	U	880
SZ-8	J16941	2/14/08	900	U	900	360	U	360	360	U	360	360	U	360	360	U	360	900	U	900	900	U	900
SZ-9	J16942	2/14/08	900	U	900	360	U	360	360	U	360	360	U	360	360	U	360	900	U	900	900	U	900
SZ-10	J16943	2/14/08	970	U	970	390	U	390	390	U	390	390	U	390	390	U	390	970	U	970	970	U	970
Dup. of SZ-10	J16944	2/14/08	980	U	980	390	U	390	390	U	390	390	U	390	390	U	390	980	U	980	980	U	980
Equip. blank	J16933	2/14/08	840	U	840	340	U	340	340	U	340	340	U	340	340	U	340	840	U	840	840	U	840

Attachment	I	Sheet No.	15 of 21
Originator	L. D. Habel	Date	04/03/08
Checked	H. M. Sulloway	Date	04/03/08
Calc. No.	0100F-CA-V0353	Rev. No.	0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Acenaphthene			Acenaphthylene			Anthracene			Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene			Benzo(ghi)perylene		
			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
RC-1	J14JT0	2/14/07	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
RB-1	J14JT1	2/14/07	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
RB-2	J14JT2	2/14/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RC-2	J14JT3	2/14/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RC-3	J14JT4	2/20/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-4	J13W57	2/21/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RB-3	J14JT5	2/21/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
OB-1	J16947	2/6/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
OB-2	J16948	2/6/08	440	U	440	440	U	440	440	U	440	440	U	440	440	U	440	440	U	440	440	U	440
OB-3	J16949	2/6/08	410	U	410	410	U	410	410	U	410	410	U	410	410	U	410	410	U	410	410	U	410
OB-4	J16950	2/6/08	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390
OB-5	J16951	2/11/08	2900	UD	2900	2900	UD	2900	2900	UD	2900	2900	UD	2900	2900	UD	2900	2900	UD	2900	2900	UD	2900
OB-6	J16952	2/11/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
OB-7	J16953	2/11/08	350	U	350	350	U	350	22	J	350	100	J	350	92	J	350	79	J	350	63	J	350
OB-8	J16954	2/11/08	360	U	360	360	U	360	360	U	360	37	J	360	36	J	360	27	J	360	27	J	360
OB-9	J16955	2/11/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
OB-10	J16956	2/11/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
OB-11	J16957	2/11/08	350	U	350	350	U	350	19	J	350	95	J	350	110	J	350	89	J	350	70	J	350
OB-12	J16958	2/11/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
OB-13	J16959	2/11/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
OB-14	J16960	2/11/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
FS-3	J169W9	2/13/08	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
FS-4	J169X0	2/13/08	350	U	350	350	U	350	350	U	350	30	J	350	32	J	350	25	J	350	22	J	350
FS-5	J169X1	2/13/08	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
FS-1	J16945	2/13/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
FS-2	J16946	2/13/08	360	U	360	360	U	360	20	J	360	90	J	360	71	J	360	49	J	360	67	J	360
SZ-1	J16934	2/14/08	350	U	350	350	U	350	26	J	350	130	J	350	120	J	350	96	J	350	87	J	350
SZ-2	J16935	2/14/08	340	U	340	340	U	340	340	U	340	66	J	340	68	J	340	62	J	340	56	J	340
SZ-3	J16936	2/14/08	350	U	350	350	U	350	350	U	350	30	J	350	35	J	350	38	J	350	350	U	350
SZ-4	J16937	2/14/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
SZ-5	J16938	2/14/08	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
SZ-6	J16939	2/14/08	360	U	360	360	U	360	360	U	360	18	J	360	360	U	360	18	J	360	360	U	360
SZ-7	J16940	2/14/08	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
SZ-8	J16941	2/14/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
SZ-9	J16942	2/14/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
SZ-10	J16943	2/14/08	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390
Dup. of SZ-10	J16944	2/14/08	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390
Equip. blank	J16933	2/14/08	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340

Attachment	1	Sheet No.	16 of 21
Originator	L. D. Habel	Date	04/03/08
Checked	H. M. Sulloway	Date	04/03/08
Calc. No.	0100F-CA-V0353	Rev. No.	0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Benzo(k)fluoranthene			Bis(2-chloro-1-			Bis(2-			Bis(2-chloroethyl) ether			Bis(2-ethylhexyl) phthalate			Butylbenzylphthalate			Carbazole		
			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
RC-1	J14JT0	2/14/07	360	U	360	360	U	360	360	U	360	360	U	360	130	JB	360	360	U	360	360	U	360
RB-1	J14JT1	2/14/07	360	U	360	360	U	360	360	U	360	360	U	360	450	B	360	360	U	360	360	U	360
RB-2	J14JT2	2/14/07	350	U	350	350	U	350	350	U	350	350	U	350	270	JB	350	350	U	350	350	U	350
RC-2	J14JT3	2/14/07	350	U	350	350	U	350	350	U	350	350	U	350	27	JB	350	350	U	350	350	U	350
RC-3	J14JT4	2/20/07	340	U	340	340	U	340	340	U	340	340	U	340	220	JB	340	340	U	340	340	U	340
RC-4	J13W57	2/21/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RB-3	J14JT5	2/21/07	350	U	350	350	U	350	350	U	350	350	U	350	28	JB	350	350	U	350	350	U	350
OB-1	J16947	2/6/08	360	U	360	360	U	360	360	U	360	360	U	360	110	JB	360	360	U	360	360	U	360
OB-2	J16948	2/6/08	440	U	440	440	U	440	440	U	440	440	U	440	42	JB	440	440	U	440	440	U	440
OB-3	J16949	2/6/08	410	U	410	410	U	410	410	U	410	410	U	410	65	JB	410	410	U	410	410	U	410
OB-4	J16950	2/6/08	390	U	390	390	U	390	390	U	390	390	U	390	82	JB	390	390	U	390	390	U	390
OB-5	J16951	2/11/08	2900	UD	2900	2900	UD	2900	2900	UD	2900	2900	UD	2900	490	JBD	2900	2900	UD	2900	2900	UD	2900
OB-6	J16952	2/11/08	360	U	360	360	U	360	360	U	360	360	U	360	240	JB	360	360	U	360	360	U	360
OB-7	J16953	2/11/08	97	J	350	350	U	350	350	U	350	350	U	350	140	JB	350	350	U	350	350	U	350
OB-8	J16954	2/11/08	43	J	360	360	U	360	360	U	360	360	U	360	140	JB	360	360	U	360	360	U	360
OB-9	J16955	2/11/08	370	U	370	370	U	370	370	U	370	370	U	370	130	JB	370	370	U	370	370	U	370
OB-10	J16956	2/11/08	370	U	370	370	U	370	370	U	370	370	U	370	220	JB	370	370	U	370	370	U	370
OB-11	J16957	2/11/08	90	J	350	350	U	350	350	U	350	350	U	350	110	JB	350	350	U	350	350	U	350
OB-12	J16958	2/11/08	360	U	360	360	U	360	360	U	360	360	U	360	110	JB	110	360	U	360	360	U	360
OB-13	J16959	2/11/08	370	U	370	370	U	370	370	U	370	370	U	370	260	JB	370	370	U	370	370	U	370
OB-14	J16960	2/11/08	360	U	360	360	U	360	360	U	360	360	U	360	330	JB	360	360	U	360	360	U	360
FS-3	J169W9	2/13/08	340	U	340	340	U	340	340	U	340	340	U	340	23	J	340	340	U	340	340	U	340
FS-4	J169X0	2/13/08	41	J	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
FS-5	J169X1	2/13/08	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
FS-1	J16945	2/13/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
FS-2	J16946	2/13/08	68	J	360	360	U	360	360	U	360	360	U	360	21	J	360	360	U	360	360	U	360
SZ-1	J16934	2/14/08	101	J	350	350	U	350	350	U	350	350	U	350	31	JB	350	350	U	350	350	U	350
SZ-2	J16935	2/14/08	59	J	340	340	U	340	340	U	340	340	U	340	26	JB	340	340	U	340	340	U	340
SZ-3	J16936	2/14/08	34	J	350	350	U	350	350	U	350	350	U	350	149	JB	350	350	U	350	350	U	350
SZ-4	J16937	2/14/08	370	U	370	370	U	370	370	U	370	370	U	370	39	JB	370	370	U	370	370	U	370
SZ-5	J16938	2/14/08	350	U	350	350	U	350	350	U	350	350	U	350	31	JB	350	350	U	350	350	U	350
SZ-6	J16939	2/14/08	360	U	360	360	U	360	360	U	360	360	U	360	62	JB	360	360	U	360	360	U	360
SZ-7	J16940	2/14/08	350	U	350	350	U	350	350	U	350	350	U	350	36	JB	350	350	U	350	350	U	350
SZ-8	J16941	2/14/08	360	U	360	360	U	360	360	U	360	360	U	360	36	JB	360	360	U	360	360	U	360
SZ-9	J16942	2/14/08	360	U	360	360	U	360	360	U	360	360	U	360	23	JB	360	360	U	360	360	U	360
SZ-10	J16943	2/14/08	390	U	390	390	U	390	390	U	390	390	U	390	38	JB	390	390	U	390	390	U	390
Dup. of SZ-10	J16944	2/14/08	390	U	390	390	U	390	390	U	390	390	U	390	32	JB	390	390	U	390	390	U	390
Equip. blank	J16933	2/14/08	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340

Attachment	I	Sheet No.	17 of 21
Originator	L. D. Habel	Date	04/03/08
Checked	H. M. Sulloway	Date	04/03/08
Calc. No.	0100F-CA-V0353	Rev. No.	0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Chrysene			Di-n-butylphthalate			Di-n-octylphthalate			Dibenz[a,h]anthracene			Dibenzofuran			Diethylphthalate			Dimethyl phthalate		
			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
RC-1	J14JT0	2/14/07	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
RB-1	J14JT1	2/14/07	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
RB-2	J14JT2	2/14/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RC-2	J14JT3	2/14/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RC-3	J14JT4	2/20/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-4	J13W57	2/21/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RB-3	J14JT5	2/21/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
OB-1	J16947	2/6/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
OB-2	J16948	2/6/08	440	U	440	440	U	440	440	U	440	440	U	440	440	U	440	440	U	440	440	U	440
OB-3	J16949	2/6/08	410	U	410	410	U	410	410	U	410	410	U	410	410	U	410	410	U	410	410	U	410
OB-4	J16950	2/6/08	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390
OB-5	J16951	2/11/08	2900	UD	2900	2900	UD	2900	2900	UD	2900	2900	UD	2900	2900	UD	2900	2900	UD	2900	2900	UD	2900
OB-6	J16952	2/11/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
OB-7	J16953	2/11/08	140	J	350	350	U	350	350	U	350	19	J	350	350	U	350	350	U	350	350	U	350
OB-8	J16954	2/11/08	48	J	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
OB-9	J16955	2/11/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
OB-10	J16956	2/11/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
OB-11	J16957	2/11/08	130	J	350	350	U	350	350	U	350	22	J	350	350	U	350	350	U	350	350	U	350
OB-12	J16958	2/11/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
OB-13	J16959	2/11/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
OB-14	J16960	2/11/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
FS-3	J169W9	2/13/08	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
FS-4	J169X0	2/13/08	46	J	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
FS-5	J169X1	2/13/08	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
FS-1	J16945	2/13/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
FS-2	J16946	2/13/08	120	J	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
SZ-1	J16934	2/14/08	159	J	350	350	U	350	350	U	350	36	J	350	350	U	350	350	U	350	350	U	350
SZ-2	J16935	2/14/08	84	J	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
SZ-3	J16936	2/14/08	56	J	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
SZ-4	J16937	2/14/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
SZ-5	J16938	2/14/08	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
SZ-6	J16939	2/14/08	26	J	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
SZ-7	J16940	2/14/08	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
SZ-8	J16941	2/14/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
SZ-9	J16942	2/14/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
SZ-10	J16943	2/14/08	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390
Dup. of SZ-10	J16944	2/14/08	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390
Equip. blank	J16933	2/14/08	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340

Attachment	1	Sheet No.	18 of 21
Originator	L. D. Habel	Date	04/03/08
Checked	H. M. Sulloway	Date	04/03/08
Calc. No.	0100F-CA-V0353	Rev. No.	0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Fluoranthene			Fluorene			Hexachlorobenzene			Hexachlorobutadiene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-1	J14JT0	2/14/07	360	U	360	360	U	360	360	U	360	360	U	360
RB-1	J14JT1	2/14/07	360	U	360	360	U	360	360	U	360	360	U	360
RB-2	J14JT2	2/14/07	350	U	350	350	U	350	350	U	350	350	U	350
RC-2	J14JT3	2/14/07	350	U	350	350	U	350	350	U	350	350	U	350
RC-3	J14JT4	2/20/07	340	U	340	340	U	340	340	U	340	340	U	340
RC-4	J13W57	2/21/07	350	U	350	350	U	350	350	U	350	350	U	350
RB-3	J14JT5	2/21/07	350	U	350	350	U	350	350	U	350	350	U	350
OB-1	J16947	2/6/08	360	U	360	360	U	360	360	U	360	360	U	360
OB-2	J16948	2/6/08	440	U	440	440	U	440	440	U	440	440	U	440
OB-3	J16949	2/6/08	410	U	410	410	U	410	410	U	410	410	U	410
OB-4	J16950	2/6/08	390	U	390	390	U	390	390	U	390	390	U	390
OB-5	J16951	2/11/08	2900	UD	2900	2900	UD	2900	2900	UD	2900	2900	UD	2900
OB-6	J16952	2/11/08	360	U	360	360	U	360	360	U	360	360	U	360
OB-7	J16953	2/11/08	200	J	350	350	U	350	350	U	350	350	U	350
OB-8	J16954	2/11/08	73	J	360	360	U	360	360	U	360	360	U	360
OB-9	J16955	2/11/08	370	U	370	370	U	370	370	U	370	370	U	370
OB-10	J16956	2/11/08	370	U	370	370	U	370	370	U	370	370	U	370
OB-11	J16957	2/11/08	220	J	350	350	U	350	350	U	350	350	U	350
OB-12	J16958	2/11/08	360	U	360	360	U	360	360	U	360	360	U	360
OB-13	J16959	2/11/08	370	U	370	370	U	370	370	U	370	370	U	370
OB-14	J16960	2/11/08	360	U	360	360	U	360	360	U	360	360	U	360
FS-3	J169W9	2/13/08	340	U	340	340	U	340	340	U	340	340	U	340
FS-4	J169X0	2/13/08	63	J	350	350	U	350	350	U	350	350	U	350
FS-5	J169X1	2/13/08	350	U	350	350	U	350	350	U	350	350	U	350
FS-1	J16945	2/13/08	370	U	370	370	U	370	370	U	370	370	U	370
FS-2	J16946	2/13/08	130	J	360	360	U	360	360	U	360	360	U	360
SZ-1	J16934	2/14/08	287	J	350	350	U	350	350	U	350	350	U	350
SZ-2	J16935	2/14/08	131	J	340	340	U	340	340	U	340	340	U	340
SZ-3	J16936	2/14/08	67	J	350	350	U	350	350	U	350	350	U	350
SZ-4	J16937	2/14/08	370	U	370	370	U	370	370	U	370	370	U	370
SZ-5	J16938	2/14/08	350	U	350	350	U	350	350	U	350	350	U	350
SZ-6	J16939	2/14/08	18	J	360	360	U	360	360	U	360	360	U	360
SZ-7	J16940	2/14/08	350	U	350	350	U	350	350	U	350	350	U	350
SZ-8	J16941	2/14/08	360	U	360	360	U	360	360	U	360	360	U	360
SZ-9	J16942	2/14/08	360	U	360	360	U	360	360	U	360	360	U	360
SZ-10	J16943	2/14/08	390	U	390	390	U	390	390	U	390	390	U	390
Dup. of SZ-10	J16944	2/14/08	390	U	390	390	U	390	390	U	390	390	U	390
Equip. blank	J16933	2/14/08	340	U	340	340	U	340	340	U	340	340	U	340

Attachment	<u>1</u>	Sheet No.	<u>19 of 21</u>
Originator	<u>L. D. Habel</u>	Date	<u>04/03/08</u>
Checked	<u>H. M. Sulloway</u>	Date	<u>04/03/08</u>
Calc. No.	<u>0100F-CA-V0353</u>	Rev. No.	<u>0</u>

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Hexachlorocyclopentadien			Hexachloroethane			Indeno(1,2,3-cd)pyrene			Isophorone			l-Nitroso-di-n-dipropylamin			N-Nitrosodiphenylamine			Naphthalene		
			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
RC-1	J14JT0	2/14/07	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
RB-1	J14JT1	2/14/07	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
RB-2	J14JT2	2/14/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RC-2	J14JT3	2/14/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RC-3	J14JT4	2/20/07	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
RC-4	J13W57	2/21/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
RB-3	J14JT5	2/21/07	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
OB-1	J16947	2/6/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
OB-2	J16948	2/6/08	440	U	440	440	U	440	440	U	440	440	U	440	440	U	440	440	U	440	440	U	440
OB-3	J16949	2/6/08	410	U	410	410	U	410	410	U	410	410	U	410	410	U	410	410	U	410	410	U	410
OB-4	J16950	2/6/08	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390
OB-5	J16951	2/11/08	2900	UD	2900	2900	UD	2900	2900	UD	2900	2900	UD	2900	2900	UD	2900	2900	UD	2900	2900	UD	2900
OB-6	J16952	2/11/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
OB-7	J16953	2/11/08	350	U	350	350	U	350	55	J	350	350	U	350	350	U	350	350	U	350	350	U	350
OB-8	J16954	2/11/08	360	U	360	360	U	360	30	J	360	360	U	360	360	U	360	360	U	360	360	U	360
OB-9	J16955	2/11/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
OB-10	J16956	2/11/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
OB-11	J16957	2/11/08	350	U	350	350	U	350	71	J	350	350	U	350	350	U	350	350	U	350	350	U	350
OB-12	J16958	2/11/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
OB-13	J16959	2/11/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
OB-14	J16960	2/11/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	18	J	360
FS-3	J169W9	2/13/08	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340
FS-4	J169X0	2/13/08	350	U	350	350	U	350	24	J	350	350	U	350	350	U	350	350	U	350	350	U	350
FS-5	J169X1	2/13/08	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
FS-1	J16945	2/13/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
FS-2	J16946	2/13/08	360	U	360	360	U	360	47	J	360	360	U	360	360	U	360	360	U	360	23	J	360
SZ-1	J16934	2/14/08	350	U	350	350	U	350	74	J	350	350	U	350	350	U	350	350	U	350	350	U	350
SZ-2	J16935	2/14/08	340	U	340	340	U	340	57	J	340	340	U	340	340	U	340	340	U	340	340	U	340
SZ-3	J16936	2/14/08	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
SZ-4	J16937	2/14/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
SZ-5	J16938	2/14/08	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
SZ-6	J16939	2/14/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
SZ-7	J16940	2/14/08	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350	350	U	350
SZ-8	J16941	2/14/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
SZ-9	J16942	2/14/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
SZ-10	J16943	2/14/08	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390
Dup. of SZ-10	J16944	2/14/08	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390
Equip. blank	J16933	2/14/08	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340	340	U	340

Attachment

Originator

Checked

Calc. No.

1

L. D. Habel

H. M. Sulloway

0100F-CA-V0353

Sheet No.

Date

Date

Rev. No.

20 of 21

04/03/08

04/03/08

0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Nitrobenzene			Pentachlorophenol			Phenanthrene			Phenol			Pyrene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
RC-1	J14JT0	2/14/07	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360
RB-1	J14JT1	2/14/07	360	U	360	890	U	890	360	U	360	360	U	360	360	U	360
RB-2	J14JT2	2/14/07	350	U	350	870	U	870	350	U	350	350	U	350	350	U	350
RC-2	J14JT3	2/14/07	350	U	350	870	U	870	350	U	350	350	U	350	350	U	350
RC-3	J14JT4	2/20/07	340	U	340	850	U	850	340	U	340	340	U	340	340	U	340
RC-4	J13W57	2/21/07	350	U	350	880	U	880	350	U	350	350	U	350	350	U	350
RB-3	J14JT5	2/21/07	350	U	350	880	U	880	350	U	350	350	U	350	350	U	350
OB-1	J16947	2/6/08	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360
OB-2	J16948	2/6/08	440	U	440	1100	U	1100	440	U	440	440	U	440	440	U	440
OB-3	J16949	2/6/08	410	U	410	1000	U	1000	410	U	410	410	U	410	410	U	410
OB-4	J16950	2/6/08	390	U	390	980	U	980	390	U	390	390	U	390	390	U	390
OB-5	J16951	2/11/08	2900	UD	2900	7100	UD	7100	2900	UD	2900	2900	UD	2900	2900	UD	2900
OB-6	J16952	2/11/08	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360
OB-7	J16953	2/11/08	350	U	350	870	U	870	100	J	350	350	U	350	250	J	350
OB-8	J16954	2/11/08	360	U	360	890	U	890	40	J	360	360	U	360	91	J	360
OB-9	J16955	2/11/08	370	U	370	920	U	920	370	U	370	370	U	370	370	U	370
OB-10	J16956	2/11/08	370	U	370	930	U	930	370	U	370	370	U	370	370	U	370
OB-11	J16957	2/11/08	350	U	350	880	U	880	110	J	350	350	U	350	260	J	350
OB-12	J16958	2/11/08	360	U	360	890	U	890	360	U	360	360	U	360	360	U	360
OB-13	J16959	2/11/08	370	U	370	930.0	U	930	370	U	370	370	U	370	370	U	370
OB-14	J16960	2/11/08	360	U	360	910	U	910	360	U	360	360	U	360	360	U	360
FS-3	J169W9	2/13/08	340	U	340	860	U	860	340	U	340	340	U	340	340	U	340
FS-4	J169X0	2/13/08	350	U	350	890	U	890	27	J	350	350	U	350	63	J	350
FS-5	J169X1	2/13/08	350	U	350	870	U	870	350	U	350	350	U	350	350	U	350
FS-1	J16945	2/13/08	370	U	370	930	U	930	370	U	370	370	U	370	370	U	370
FS-2	J16946	2/13/08	360	U	360	890	U	890	140	J	360	360	U	360	310	J	360
SZ-1	J16934	2/14/08	350	U	350	870.0	U	870	145	J	350	350	U	350	268	J	350
SZ-2	J16935	2/14/08	340	U	340	860	U	860	78	J	340	340	U	340	149	J	340
SZ-3	J16936	2/14/08	350	U	350	890	U	890	42	J	350	350	U	350	67	J	350
SZ-4	J16937	2/14/08	370	U	370	930	U	930	370	U	370	370	U	370	370	U	370
SZ-5	J16938	2/14/08	350	U	350	890	U	890	350	U	350	350	U	350	350	U	350
SZ-6	J16939	2/14/08	360	U	360	900	U	900	360	U	360	360	U	360	26	J	360
SZ-7	J16940	2/14/08	350	U	350	880.0	U	880	350	U	350	350	U	350	350	U	350
SZ-8	J16941	2/14/08	360	U	360	900.0	U	900	360	U	360	360	U	360	360	U	360
SZ-9	J16942	2/14/08	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360
SZ-10	J16943	2/14/08	390	U	390	970	U	970	390	U	390	390	U	390	390	U	390
Dup. of SZ-10	J16944	2/14/08	390	U	390	980	U	980	390	U	390	390	U	390	390	U	390
Equip. blank	J16933	2/14/08	340	U	340	840	U	840	340	U	340	340	U	340	340	U	340

Attachment	1	Sheet No.	21 of 21
Originator	L. D. Habel	Date	04/03/08
Checked	H. M. Sulloway	Date	04/03/08
Calc. No.	0100F-CA-V0353	Rev. No.	0

CALCULATION COVER SHEET

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

Area: 100-F

Discipline: Environmental *Calculation No: 0100F-CA-V0354

Subject: 100-F-26:9 Waste Site Cleanup Verification Hazard Quotient and Carcinogenic Risk Calculation

Computer Program: Excel Program No: Excel 2003

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

Committed Calculation ☒

Preliminary ☐

Superseded ☐

Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Summary = 4	L. D. Habel	H. M. Sulloway		J. D. Fancher
		4/3/18

SUMMARY OF REVISION

Washington Closure Hanford				CALCULATION SHEET			
Originator:	L.D. Habel	Date:	4/3/08	Calc. No.:	0100F-CA-V0354	Rev.:	0
Project:	100-F Field Remediation	Job No:	14655	Checked:	H. M. Sulloway	Date:	4/3/08
Subject:	100-F-26:9 Pipelines Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 1 of 4	

PURPOSE:

Provide documentation to support the calculation of the hazard quotient (HQ) and carcinogenic (excess cancer) risk values for the 100-F-26:4 subsite remedial action. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2005), 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 x 10⁻⁶ for individual carcinogens
- 4) A cumulative excess cancer risk of <1 x 10⁻⁵ for carcinogens.

GIVEN/REFERENCES:

- 1) DOE-RL, 2005, *Remedial Design Report/Remedial Action Work Plan for the 100 Areas*, DOE/RL-96-17, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- 2) EPA, 1994, *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.
- 3) WAC 173-340, "Model Toxics Control Act – Cleanup," *Washington Administrative Code*, 1996.
- 4) WCH, 2008, *100-F-26:9 Pipelines Cleanup Verification 95% UCL Calculation*, 0100F-CA-V0353, Washington Closure Hanford, Richland, Washington.

SOLUTION:

- 1) Calculate an HQ for each noncarcinogenic constituent detected above background and compare it to the individual HQ of <1.0 (DOE-RL 2005).
- 2) Sum the HQs and compare to the cumulative HQ criterion of <1.0.
- 3) Calculate an excess cancer risk value for each carcinogenic constituent detected above background and compare it to the individual excess cancer risk criterion of <1 x 10⁻⁶ (DOE-RL 2005).
- 4) Sum the excess cancer risk values and compare to the cumulative cancer risk criterion of <1 x 10⁻⁵.

Washington Closure Hanford

CALCULATION SHEET

Originator:	L.D. Habel	Date:	4/3/08	Calc. No.:	0100F-CA-V0354	Rev.:	0
Project:	100-F Field Remediation	Job No:	14655	Checked:	H. M. Sulloway	Date:	4/3/08
Subject:	100-F-26:9 Pipelines Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 2 of 4	

METHODOLOGY:

HQ and carcinogenic risk calculations were conservatively calculated for the excavation portion of the 100-F-26:9 waste site using the higher of the statistically determined value for each analyte in the shallow zone and overburden stockpile decision units (WCH 2008) and the maximum detected values in the focused samples. Of the nonradionuclide contaminants of potential concern (COPC) barium, copper, lead, selenium, silver, and zinc required the HQ and risk calculations because they were quantified above background. Additionally, boron and molybdenum required the HQ and risk calculations because these COPCs were detected and a Washington State or Hanford Site background value is not available. Hexavalent chromium, aroclor-1254, aroclor-1260 and multiple organic COPCs (as listed in Table 1) required the HQ and risk calculations because they were detected and cannot be attributed to natural occurrence. 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 result for molybdenum (1.3 mg/kg), divided by the noncarcinogenic RAG value of 400 mg/kg (calculated in accordance with the noncarcinogenic toxic effects WAC 173-340-740[3]), is 3.3×10^{-3} . Comparing this value, and all other individual values, to the requirement of <1.0 , this criterion is met.
- 2) After the HQ calculations are completed for the appropriate analytes, the cumulative HQ is 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 1.9×10^{-1} . Comparing this values to the requirement of <1.0 , this criterion is met.
- 3) To calculate the excess cancer risk, the maximum or statistical value is divided by the carcinogenic RAG value, then multiplied by 1×10^{-6} . For example, the maximum value for hexavalent chromium is 0.38 mg/kg; divided by 2.1 mg/kg, and multiplied as indicated, is 1.8×10^{-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 sum of the excess cancer risk values is 2.1×10^{-6} . Comparing this value to the requirement of $<1 \times 10^{-5}$, this criterion is met.

RESULTS:

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

Table 1 shows the results of the calculation.

Washington Closure Hanford

CALCULATION SHEET

Originator:	L.D. Habel	Date:	4/3/08	Calc. No.:	0100F-CA-V0354	Rev.:	0
Project:	100-F Field Remediation	Job No:	14655	Checked:	H. M. Sulloway	Date:	4/3/08
Subject:	100-F-26:9 Pipelines Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 3 of 4	

**Table 1. Hazard Quotient and Excess Cancer Risk Results for the
100-F-26:9 Waste Site.**

Contaminants of Potential Concern	Statistical Value ^a (mg/kg)	Noncarcinogen RAG ^b (mg/kg)	Hazard Quotient	Carcinogen RAG ^b (mg/kg)	Carcinogen Risk
Metals					
Barium	329	5,600	5.9E-02	--	--
Boron	28.6	16,000	1.8E-03	--	--
Chromium, hexavalent ^c	0.38	240	1.6E-03	2.1	1.8E-07
Copper	26.5	2,960	9.0E-03	--	--
Lead ^d	16.9	353	4.8E-02	--	--
Molybdenum	1.3	400	3.3E-03	--	--
Selenium	1.3	400	3.3E-03	--	--
Silver	1.2	400	3.0E-03	--	--
Zinc	77.6	24,000	3.2E-03	--	--
Semivolatiles					
Anthracene	0.026	24,000	1.1E-06	--	--
Benzo(a)anthracene	0.13	--	--	1.37	9.5E-08
Benzo(a)pyrene	0.12	--	--	0.33 ^e	3.6E-07
Benzo(b)fluoranthene	0.096	--	--	1.37	7.0E-08
Benzo(k)fluoranthene	0.101	--	--	13.7	7.4E-09
Benzo(ghi)perylene ^f	0.087	2,400	3.6E-05	--	--
Bis(2-ethylhexyl) phthalate	0.450	1,600	2.8E-04	71.4	6.3E-09
Chrysene	0.159	--	--	137	1.2E-09
Dibenzo(a,h)anthracene	0.036	--	--	0.33 ^e	1.1E-07
Fluoranthene	0.287	3,200	9.0E-05	--	--
Indeno(1,2,3-cd) pyrene	0.074	--	--	1.37	5.4E-08
Naphthalene	0.023	1,600	1.4E-05	--	--
Phenanthrene ^f	0.145	24,000	6.0E-06	--	--
Pyrene	0.310	2,400	1.3E-04	--	--
Polychlorinated Biphenyls					
Aroclor-1254	0.092	1.6	5.8E-02	0.5	1.8E-07
Aroclor-1260	0.180	--	--	0.5	3.6E-07
Totals					
Cumulative Hazard Quotient:			1.9E-01		
Cumulative Excess Cancer Risk:				2.1E-06	

Notes:

RAG = remedial action goal

-- = not applicable

^a = From WCH 2008.^b = Value obtained from *Washington Administrative Code* (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.^c = Value for the carcinogen RAG calculated based on the inhalation exposure pathway (WAC) 173-340-750(3), 1996.^d = Value for the noncarcinogen RAG obtained from EPA (1994).^e = Individual carcinogenic risk calculated using the required detection limit. Contribution to cumulative carcinogenic risk calculated based on the remedial action goal instead of the required detection limit, per WAC 173-340-740(3), Method B, 1996.^f = Toxicity data for this chemical are not available. RAG based on the following surrogate chemicals: Contaminant: phenanthrene, surrogate: anthracene; benzo(g,h,i)perylene, surrogate: pyrene.

Washington Closure Hanford

CALCULATION SHEET

Originator:	L.D. Habel	Date:	4/3/08	Calc. No.:	0100F-CA-V0354	Rev.:	0
Project:	100-F Field Remediation	Job No:	14655	Checked:	H. M. Sulloway	Date:	4/3/08
Subject:	100-F-26:9 Pipelines Hazard Quotient and Carcinogenic Risk Calculations						Sheet No. 4 of 4

CONCLUSION:

This calculation demonstrates that the 100-F-26:9 waste site meets the requirements for the hazard quotients and carcinogenic (excess cancer) risk as identified in the RDR/RAWP (DOE-RL 2005).

Calculation Brief Distribution Sheet

Calculation Number: 0100F-CA-V0354

100-F-26:9 Waste Site Cleanup Verification Hazard Quotient and Carcinogenic Risk Calculation

COA: R10F26-N6W0

TITLE	NAME	MSIN	COPIES
Originator	L. D. Habel	H4-23	1
Checker	H. M. Sulloway	H4-23	1
Reviewer	NA		
Approver	J. D. Fancher	X9-07	
CVP Files			
Document Control	M. L. Cockrum	H4-11	1
100 Area Project Files			
Calc. Brief Files	M. T. Hughes	H4-23	Original
Other			

CALCULATION COVER SHEETProject Title: 100-F Area Field RemediationJob No. **14655**Area: 100-FDiscipline: Environmental*Calculation No: 0100F-CA-V0363Subject: 100-F-26:9 Confirmatory Sampling Hazard Quotient and Carcinogenic Risk CalculationComputer Program: ExcelProgram No: Excel 2003

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	Total = 12	L. D. Habel	H. M. Sulloway		J.M. Capron	5/28/08
1	Total = 12	L. D. Habel	H. M. Sulloway	n/a	J.M. Capron	

SUMMARY OF REVISION

1	Corrected RAG entry for benzo(k)fluoranthene in table 1. Changed oral reference doses for barium, cadmium, mercury, molybdenum, silver and zinc in table 6. Footnote b modified in table 6.

Washington Closure Hanford

CALCULATION SHEET

Originator:	L.D. Habel	Date:	7/15/08	Calc. No.:	0100F-CA-V0363	Rev.:	1
Project:	100-F Field Remediation	Job No:	14655	Checked:	H. M. Sulloway	Date:	7/15/08
Subject:	100-F-26:9 Confirmatory Sampling Hazard Quotient and Carcinogenic Risk Calculations						Sheet No. 1 of 11

PURPOSE:

Provide documentation to support the calculation of the hazard quotient (HQ) and carcinogenic (excess cancer) risk values for the 100-F-26:9 subsite confirmatory sampling. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2005), 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 x 10⁻⁶ for individual carcinogens
- 4) A cumulative excess cancer risk of <1 x 10⁻⁵ for carcinogens.

GIVEN/REFERENCES:

- 1) DOE-RL, 2005, *Remedial Design Report/Remedial Action Work Plan for the 100 Areas*, DOE/RL-96-17, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- 2) WAC 173-340, "Model Toxics Control Act – Cleanup," *Washington Administrative Code*, 1996.
- 3) WCH, 2008, *Remaining Sites Verification Package for 100-F-26:9 1607-F2 Sanitary Sewer Pipelines*, Attachment to Waste Site Reclassification Form 2008-029, May 2008, Washington Closure Hanford, Richland, Washington.

SOLUTION:

- 1) Calculate an HQ for each noncarcinogenic constituent detected above background and compare it to the individual HQ of <1.0 (DOE-RL 2005).
- 2) Sum the HQs and compare to the cumulative HQ criterion of <1.0.
- 3) Calculate an excess cancer risk value for each carcinogenic constituent detected above background and compare it to the individual excess cancer risk criterion of <1 x 10⁻⁶ (DOE-RL 2005).
- 4) Sum the excess cancer risk values and compare to the cumulative cancer risk criterion of <1 x 10⁻⁵.

Washington Closure Hanford		CALCULATION SHEET						
Originator:	L.D. Habel	Date:	7/15/08	Calc. No.:	0100F-CA-V0363	Rev.:	1	
Project:	100-F Field Remediation	Job No:	14655	Checked:	H. M. Sulloway	Date:	7/15/08	
Subject:	100-F-26:9 Confirmatory Sampling Hazard Quotient and Carcinogenic Risk Calculations						Sheet No. 2 of 11	

METHODOLOGY:

HQ and carcinogenic risk calculations were determined for each service area of the 100-F-26:9 waste site. The calculations used the maximum value for each analyte from the results of the pipe material, pipe contents (sediment) and underlying soil from among the test pit associated with each service area. Service Areas 2, 9, 10 and 11 were remediated and are included in a separate calculation. Of the nonradionuclide contaminants of potential concern (COPC) barium, cadmium, chromium, copper, lead, mercury, nickel, silver and zinc required the HQ and risk calculations for one or more service areas because they were quantified above background. Additionally, boron and molybdenum required the HQ and risk calculations for one or more service areas because these COPCs were detected and a Washington State or Hanford Site background value is not available. Hexavalent chromium, aroclor-1254, aroclor-1260, and multiple semivolatile organic analytes (as shown in Tables 1 - 7, below) and are included for one or more service areas because they were detected by laboratory analysis and cannot be attributed to natural occurrence. All other site nonradionuclide COPCs were not detected or were quantified below background levels. 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. As a result, the maximum lead concentration is reported but not included in the hazard quotient calculation. Total petroleum hydrocarbon (TPH) data are not included in the calculations since TPH includes a broad range of constituents rather than an individual contaminant.

A site specific area factor was determined for Service Area 7 to account for the small size of the waste site. This value was used to calculate the soil ingestion daily intake (Figure 1).

An example of the HQ and risk calculations is presented below:

- 1) For example, the maximum result for molybdenum (0.71 mg/kg) in Service Area 1, divided by the noncarcinogenic RAG value of 400 mg/kg (calculated in accordance with the noncarcinogenic toxic effects WAC 173-340-740[3]), is 1.8×10^{-3} . Comparing this value, and all other individual values, to the requirement of <1.0 , this criterion is met.
- 2) After the HQ calculations are completed for the appropriate analytes, the cumulative HQ is 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 for Service Area 1 is 1.5×10^{-2} . Comparing this value and the values from the other service areas to the requirement of <1.0 , this criterion is met.
- 3) To calculate the excess cancer risk, the maximum value is divided by the carcinogenic RAG value, then multiplied by 1×10^{-6} . For example, the maximum value for hexavalent chromium in Service Area 1 is 0.26 mg/kg; divided by 2.1 mg/kg, and multiplied as indicated, is 1.2×10^{-7} . Comparing this value, and all other individual values, to the requirement of $<1 \times 10^{-6}$, this criterion is met.
- 4) After these calculations are completed for the carcinogenic analytes, the cumulative excess cancer risk is obtained by summing the individual values. The sum of the excess cancer risk values for Service Area 1 is 3.2×10^{-7} . Comparing this value and the values from the other service areas to the requirement of $<1 \times 10^{-5}$, this criterion is met.

Washington Closure Hanford

CALCULATION SHEET

Originator:	L.D. Habel	Date:	7/15/08	Calc. No.:	0100F-CA-V0363	Rev.:	1
Project:	100-F Field Remediation	Job No:	14655	Checked:	H. M. Sulloway	Date:	7/15/08
Subject:	100-F-26:9 Confirmatory Sampling Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 3 of 11	

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.

Figure 1. Supporting Calculations for Determining Site-Specific HQs for the 100-F-26:9 Waste Site: Service Area 7.

Site-specific area factor for soil ingestion pathway (from DOE-RL 1995).
 DOE-RL, 1995, *Hanford Site Risk Assessment Methodology* (HSRAM), DOE/RL-91-45, Rev. 3, Appendix D,
 U.S. Department of Energy, Richland Operations Office, Richland, Washington.

AFS is an area factor for soil ingestion: $AFS = A/1000$ for $A < 1000 \text{ m}^2$
 $AFS = 1$ for $A > 1000 \text{ m}^2$, where A is the area of the contaminated zone, m^2

Service Area 7 = $1.17\text{E}+01 \text{ m}^2$ (11.7 m long x 1 m wide)
 Site-specific area factor (AFS) = $1.17\text{E}-02$

Soil Ingestion Daily Intake Factor = $(AFS \cdot SI \cdot ED \cdot OFS \cdot UCF1) / (BW \cdot AL \cdot UCF2) = AFS \cdot (\text{Soil Ingestion Constant})$
 Contaminant Ingestion Daily Intake = $(CONC) \cdot (\text{Soil Ingestion Daily Intake Factor})$

Variable	Value	Description
AFS	$1.17\text{E}-02$	unitless, Site-specific area factor
SI	73	g/yr, Soil Ingestion rate
ED	30	years, Exposure Duration
OFS	0.8	unitless, Occupancy factor
UCF1	0.001	kg/gm, Units conversion factor
BW	70	kg, Body weight
AL	70	years, Average lifetime
UCF2	365	days/year, Units conversion factor
RfD	contaminant specific	(mg/kg-day) Oral reference dose
CSF	contaminant specific	(kg-day/mg) Oral Cancer Slope Factor
CONC	contaminant specific	concentration of contaminant (mg/kg)

Soil Ingestion Daily Intake Factor = $AFS \cdot (\text{Soil Ingestion Constant})$
 Soil Ingestion Constant = $9.80\text{E}-07 \text{ day}^{-1}$
 Soil Ingestion Daily Intake Factor = $1.15\text{E}-08 \text{ day}^{-1}$
 Contaminant Ingestion Daily Intake = $(\text{Soil Ingestion Daily Intake Factor}) \cdot (\text{Contaminant Concentration})$
 Hazard Quotient = $(\text{Contaminant Ingestion Daily Intake}) / (RfD)$
 Carcinogenic Risk = $(\text{Contaminant Ingestion Daily Intake}) \cdot (CSF)$

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**Table 1. Hazard Quotient and Excess Cancer Risk Results for the
100-F-26:9 Waste Site: Service Area 1.**

Contaminants of Potential Concern	Maximum Value ^a (mg/kg)	Noncarcinogen RAG ^b (mg/kg)	Hazard Quotient	Carcinogen RAG ^b (mg/kg)	Carcinogen Risk
Metals					
Boron	4.8	16,000	3.0E-04	--	--
Chromium, hexavalent ^c	0.26	240	1.1E-03	2.1	1.2E-07
Molybdenum	0.711	400	1.8E-03	--	--
Zinc	83.5	24,000	3.5E-03	--	--
Semivolatiles					
Benzo(a)anthracene	0.019	--	--	1.37 ^d	1.4E-08
Benzo(a)pyrene	0.021	--	--	0.33 ^e	6.4E-08
Benzo(k)fluoranthene	0.022	--	--	13.7 ^d	1.6E-09
Bis(2-ethylhexyl) phthalate	0.022	1,600	1.4E-05	71.4	3.1E-10
Chrysene	0.029	--	--	137 ^d	2.1E-10
Di-n-butylphthalate	0.018	8,000	2.3E-06	--	--
Fluoranthene	0.037	3,200	1.2E-05	--	--
Phenanthrene ^f	0.029	24,000	1.2E-06	--	--
Pyrene	0.047	2,400	2.0E-05	--	--
Polychlorinated Biphenyls					
Aroclor-1254	0.014	1.6	8.8E-03	0.5	2.8E-08
Totals					
Cumulative Hazard Quotient:			1.5E-02		
Cumulative Excess Cancer Risk:					3.2E-07

Notes:

RAG = remedial action goal

-- = not applicable

^a = From WCH 2008.^b = Value obtained from Washington Administrative Code (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.^c = Value for the carcinogen RAG calculated based on the inhalation exposure pathway (WAC) 173-340-750(3), 1996.^d = Calculated with toxicity values updated through May 1, 2008, using the appropriate formulas from WAC 173-340-740 (Ecology 1996). Updated toxicity values are available from the EPA Integrated Risk Information System (IRIS) at < <http://www.epa.gov/iris> > or from the Risk Assessment Information System (RAIS) database of the Oak Ridge National Laboratory (ORNL) on the Internet at < <http://risk.lsd.ornl.gov> >.^e = Individual carcinogenic risk calculated using the required detection limit. Contribution to cumulative carcinogenic risk calculated based on the remedial action goal instead of the required detection limit, per WAC 173-340-740(3), Method B, 1996.^f = Toxicity data for this chemical are not available. RAG based on the following surrogate chemical: Contaminant: phenanthrene, surrogate: anthracene

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**Table 2. Hazard Quotient and Excess Cancer Risk Results for the
100-F-26:9 Waste Site: Service Area 3.**

Contaminants of Potential Concern	Maximum Value ^a (mg/kg)	Noncarcinogen RAG ^b (mg/kg)	Hazard Quotient	Carcinogen RAG ^b (mg/kg)	Carcinogen Risk
Metals					
Boron	13.6	16,000	8.5E-04	--	--
Cadmium	0.90	80	1.1E-02	13.9	6.5E-08
Copper	26.1	2,960	8.8E-03	--	--
Lead ^c	17.8	--	--	--	--
Mercury	0.90	24	3.8E-02	--	--
Molybdenum	1.0	400	2.5E-03	--	--
Zinc	359	24,000	1.5E-02	--	--
Semivolatiles					
Anthracene	0.069	24,000	2.9E-06	--	--
Benzo(a)anthracene	0.36	--	--	1.37 ^d	2.6E-07
Benzo(a)pyrene	0.29	--	--	0.33 ^e	8.8E-07
Benzo(b)fluoranthene	0.28	--	--	1.37 ^d	2.0E-07
Benzo(k)fluoranthene	0.29	--	--	13.7 ^d	2.1E-08
Benzo(ghi)perylene ^f	0.18	2,400	7.5E-05	--	--
Bis(2-ethylhexyl) phthalate	0.14	1,600	8.8E-05	71.4	2.0E-09
Butylbenzylphthalate	0.071	16,000	4.4E-06	--	--
Carbazole	0.065	--	--	50	1.3E-09
Chrysene	0.37	--	--	137 ^d	2.7E-09
Dibenzo(a,h)anthracene	0.079	--	--	0.33 ^e	2.4E-07
Di-n-butylphthalate	0.50	8,000	6.3E-05	--	--
Fluoranthene	0.62	3,200	1.9E-04	--	--
Indeno(1,2,3-cd) pyrene	0.18	--	--	1.37	1.3E-07
Phenanthrene ^f	0.22	24,000	9.2E-06	--	--
Pyrene	0.47	2,400	2.0E-04	--	--
Polychlorinated Biphenyls					
Aroclor-1260	0.013	--	--	0.5	2.6E-08
Totals					
Cumulative Hazard Quotient:			7.7E-02		
Cumulative Excess Cancer Risk:					3.4E-06

Notes:

RAG = remedial action goal

-- = not applicable

^a = From WCH 2008.^b = Value obtained from *Washington Administrative Code* (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.^c = No RfD or CSF

^d = Calculated with toxicity values updated through May 1, 2008, using the appropriate formulas from WAC 173-340-740 (Ecology 1996). Updated toxicity values are available from the EPA Integrated Risk Information System (IRIS) at < <http://www.epa.gov/iris> > or from the Risk Assessment Information System (RAIS) database of the Oak Ridge National Laboratory (ORNL) on the Internet at < <http://risk.lsd.ornl.gov> >.

^e = Individual carcinogenic risk calculated using the required detection limit. Contribution to cumulative carcinogenic risk calculated based on the remedial action goal instead of the required detection limit, per WAC 173-340-740(3), Method B, 1996.

^f = Toxicity data for this chemical are not available. RAG based on the following surrogate chemicals: Contaminant: phenanthrene, surrogate: anthracene; benzo(g,h,i)perylene, surrogate: pyrene.

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**Table 3. Hazard Quotient and Excess Cancer Risk Results for the
100-F-26:9 Waste Site: Service Area 4.**

Contaminants of Potential Concern	Maximum Value ^a (mg/kg)	Noncarcinogen RAG ^b (mg/kg)	Hazard Quotient	Carcinogen RAG ^b (mg/kg)	Carcinogen Risk
Metals					
Boron	16.7	16,000	1.0E-03	--	--
Chromium, hexavalent ^c	0.25	240	1.1E-03	2.1	1.2E-07
Lead ^d	23.5	--	--	--	--
Mercury	1.3	24	5.4E-02	--	--
Molybdenum	0.338	400	8.5E-04	--	--
Zinc	79.4	24,000	3.3E-03	--	--
Semivolatiles					
Benzo(a)anthracene	0.029	--	--	1.37 ^e	2.1E-08
Benzo(a)pyrene	0.024	--	--	0.33 ^f	7.3E-08
Benzo(b)fluoranthene	0.033	--	--	1.37 ^e	2.4E-08
Benzo(k)fluoranthene	0.021	--	--	13.7 ^e	1.5E-09
Benzo(ghi)perylene ^g	0.023	2,400	9.6E-06	--	--
Bis(2-ethylhexyl) phthalate	0.067	1,600	4.2E-05	71.4	9.4E-10
Chrysene	0.037	--	--	137 ^e	2.7E-10
Di-n-butylphthalate	0.045	8,000	5.6E-06	--	--
Fluoranthene	0.046	3,200	1.4E-05	--	--
Indeno(1,2,3-cd) pyrene	0.018	--	--	1.37	1.3E-08
Pyrene	0.032	2,400	1.3E-05	--	--
Totals					
Cumulative Hazard Quotient:			6.1E-02		
Cumulative Excess Cancer Risk:				3.6E-07	

Notes:

RAG = remedial action goal

-- = not applicable

^a = From WCH 2008.^b = Value obtained from *Washington Administrative Code* (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.^c = Value for the carcinogen RAG calculated based on the inhalation exposure pathway (WAC) 173-340-750(3), 1996.^d = No RfD or CSF

^e = Calculated with toxicity values updated through May 1, 2008, using the appropriate formulas from WAC 173-340-740 (Ecology 1996). Updated toxicity values are available from the EPA Integrated Risk Information System (IRIS) at < <http://www.epa.gov/iris> > or from the Risk Assessment Information System (RAIS) database of the Oak Ridge National Laboratory (ORNL) on the Internet at < <http://risk.lsd.ornl.gov> >.

^f = Individual carcinogenic risk calculated using the required detection limit. Contribution to cumulative carcinogenic risk calculated based on the remedial action goal instead of the required detection limit, per WAC 173-340-740(3), Method B, 1996.

^g = Toxicity data for this chemical are not available. RAG based on the following surrogate chemical: Contaminant: benzo(g,h,i)perylene, surrogate: pyrene.

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Table 4. Hazard Quotient and Excess Cancer Risk Results for the 100-F-26:9 Waste Site: Service Area 5 Samples.

Contaminants of Potential Concern	Maximum Value ^a (mg/kg)	Noncarcinogen RAG ^b (mg/kg)	Hazard Quotient	Carcinogen RAG ^b (mg/kg)	Carcinogen Risk
Metals					
Barium	198	5,600	3.5E-02	--	--
Boron	11.5	16,000	7.2E-04	--	--
Chromium, hexavalent ^c	0.53	240	2.2E-03	2.1	2.5E-07
Copper	33.6	2,960	1.1E-02	--	--
Lead ^d	62.7	--	--	--	--
Mercury	10.50	24	4.4E-01	--	--
Molybdenum	1.6	400	4.0E-03	--	--
Nickel	39.4	1,600	2.5E-02	--	--
Silver	0.862	400	2.2E-03	--	--
Zinc	93.4	24,000	3.9E-03	--	--
Semivolatiles					
Acenaphthylene	0.022	4,800	4.6E-06	--	--
Anthracene	0.019	24,000	7.9E-07	--	--
Benzo(a)anthracene	0.041	--	--	1.37 ^e	3.0E-08
Benzo(a)pyrene	0.039	--	--	0.33 ^f	1.2E-07
Benzo(b)fluoranthene	0.065	--	--	1.37 ^e	4.7E-08
Benzo(k)fluoranthene	0.062	--	--	13.7 ^e	4.5E-09
Bis(2-ethylhexyl) phthalate	0.456	1,600	2.9E-04	71.4	6.4E-09
Chrysene	0.076	--	--	137 ^e	5.5E-10
Fluoranthene	0.122	3,200	3.8E-05	--	--
Phenanthrene ^f	0.04	24,000	1.7E-06	--	--
Phenol	0.066	24,000	2.8E-06	--	--
Pyrene	0.077	2,400	3.2E-05	--	--
Polychlorinated Biphenyls					
Aroclor-1254	0.18	1.6	1.1E-01	0.5	3.6E-07
Totals					
Cumulative Hazard Quotient:			6.3E-01		
Cumulative Excess Cancer Risk:				9.8E-07	

Notes:

RAG = remedial action goal

-- = not applicable

^a = From WCH 2008.^b = Value obtained from *Washington Administrative Code* (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.^c = Value for the carcinogen RAG calculated based on the inhalation exposure pathway (WAC) 173-340-750(3), 1996.^d = No RfD or CSF

^e = Calculated with toxicity values updated through May 1, 2008, using the appropriate formulas from WAC 173-340-740 (Ecology 1996). Updated toxicity values are available from the EPA Integrated Risk Information System (IRIS) at < <http://www.epa.gov/iris> > or from the Risk Assessment Information System (RAIS) database of the Oak Ridge National Laboratory (ORNL) on the Internet at < <http://risk.lsd.ornl.gov> >.

^f = Individual carcinogenic risk calculated using the required detection limit. Contribution to cumulative carcinogenic risk calculated based on the remedial action goal instead of the required detection limit, per WAC 173-340-740(3), Method B, 1996.

^g = Toxicity data for this chemical are not available. RAG based on the following surrogate chemicals: Contaminant: phenanthrene, surrogate: anthracene.

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**Table 5. Hazard Quotient and Excess Cancer Risk Results for the
100-F-26:9 Waste Site: Service Area 6 Samples.**

Contaminants of Potential Concern	Maximum Value ^a (mg/kg)	Noncarcinogen RAG ^b (mg/kg)	Hazard Quotient	Carcinogen RAG ^b (mg/kg)	Carcinogen Risk
Metals					
Boron	4.1	16,000	2.6E-04	--	--
Chromium, hexavalent ^c	0.26	240	1.1E-03	2.1	1.2E-07
Molybdenum	0.33	400	8.3E-04	--	--
Semivolatiles					
Bis(2-ethylhexyl) phthalate	0.049	1,600	3.1E-05	71.4	6.9E-10
Butylbenzylphthalate	0.048	16,000	3.0E-06	--	--
Diethylphthalate	0.034	64,000	5.3E-07	--	--
Di-n-butylphthalate	0.036	8,000	4.5E-06	--	--
Polychlorinated Biphenyls					
Aroclor-1260	0.028	--	--	0.5	5.6E-08
Totals					
Cumulative Hazard Quotient:			2.2E-03		
Cumulative Excess Cancer Risk:					1.8E-07

Notes:

RAG = remedial action goal

-- = not applicable

^a = From WCH 2008.^b = Value obtained from *Washington Administrative Code* (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.^c = Value for the carcinogen RAG calculated based on the inhalation exposure pathway (WAC) 173-340-750(3), 1996.

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**Table 6. Hazard Quotient and Excess Cancer Risk Results for the
100-F-26:9 Waste Site: Service Area 7 Samples.**

Contaminants of Potential Concern	Maximum Value ^a (mg/kg)	Oral Reference Dose ^b (RfD) (mg/kg-day)	Hazard Quotient	Carcinogen Slope ^b Factor (kg-day/mg)	Carcinogen Risk
Metals					
Barium	133	2.00E-01	7.6E-06	--	--
Boron	7.5	2.00E-01	4.3E-07	--	--
Cadmium	1.8	1.00E-03	2.1E-05	6.30E+00	1.3E-07
Chromium, total	30	1.50E+00	2.3E-07	--	--
Copper	48.6	3.70E-02	1.5E-05	--	--
Lead ^d	131	--	--	--	--
Mercury	15.4	3.00E-04	5.9E-04	--	--
Molybdenum	0.95	5.00E-03	2.2E-06	--	--
Silver	1.2	5.00E-03	2.8E-06	--	--
Zinc	140	3.00E-01	5.4E-06	--	--
Semivolatiles					
Bis(2-ethylhexyl) phthalate	0.33	2.00E-02	1.9E-07	1.40E-02	5.3E-11
Di-n-butylphthalate	0.23	1.00E-01	2.6E-08	--	--
Polychlorinated Biphenyls					
Aroclor-1254	0.55	2.00E-05	3.2E-04	2.00E+00	1.3E-08
Totals					
Cumulative Hazard Quotient:			9.6E-04		
Cumulative Excess Cancer Risk:					1.4E-07

Notes:

RAG = remedial action goal

-- = not applicable

^a = From WCH 2008.^b = Obtained from the Ecology Cleanup Levels and Risk Calculations (CLARC) database at <<http://www.ecy.wa.gov>>.^c = Value for the carcinogen RAG calculated based on the inhalation exposure pathway (WAC) 173-340-750(3), 1996.^d = No RfD or CSF

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CALCULATION SHEET

Originator:	L.D. Habel	Date:	7/15/08	Calc. No.:	0100F-CA-V0368	Rev.:	1
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**Table 7. Hazard Quotient and Excess Cancer Risk Results for the
100-F-26:9 Waste Site: Service Area 8 Samples.**

Contaminants of Potential Concern	Maximum Value ^a (mg/kg)	Noncarcinogen RAG ^b (mg/kg)	Hazard Quotient	Carcinogen RAG ^b (mg/kg)	Carcinogen Risk
Metals					
Boron	7.2	16,000	4.5E-04	--	--
Chromium, hexavalent ^c	0.34	240	1.4E-03	2.1	1.6E-07
Lead ^d	156	--	--	--	--
Molybdenum	0.69	400	1.7E-03	--	--
Semivolatiles					
Bis(2-ethylhexyl) phthalate	0.11	1,600	6.9E-05	71.4	1.5E-09
Butylbenzylphthalate	0.049	16,000	3.1E-06	--	--
Diethylphthalate	0.031	64,000	4.8E-07	--	--
Totals					
Cumulative Hazard Quotient:			3.7E-03		
Cumulative Excess Cancer Risk:					1.6E-07

Notes:

RAG = remedial action goal

-- = not applicable

^a = From WCH 2008.^b = Value obtained from *Washington Administrative Code* (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.^c = Value for the carcinogen RAG calculated based on the inhalation exposure pathway (WAC) 173-340-750(3), 1996.^d = No RfD or CSF

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CALCULATION SHEET

Originator:	L.D. Habel	Date:	7/15/08	Calc. No.:	0100F-CA-V0363	Rev.:	1
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1 **CONCLUSION:**

2

3 This calculation demonstrates that the 100-F-26:9 waste site meets the requirements for the hazard
 4 quotients and carcinogenic (excess cancer) risk as identified in the RDR/RAWP (DOE-RL 2005) for
 5 Service Areas 1, 3, 4, 5, 6, 7 and 8.

Calculation Brief Distribution Sheet**Calculation Number: 0100F-CA-V0363****100-F-26:9 Confirmatory Sampling Hazard Quotient and Carcinogenic Risk Calculation**

TITLE	NAME	MSIN	COPIES
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Other			

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel Date 05/21/08
 Project 100-F Field Remediation Job No. 14655
 Subject 100-F-26-9 Staging Pile Cleanup Verification 95% UCL Calculation

Calc. No. 0100F-CA-V0364 Rev. No. 0
 Checked H. M. Sulloway Date 05/21/08
 Sheet No. 4 of 11

1 Summary (continued)

2

3 Staging Pile - WAC 173-340 3-Part Test for most stringent RAG:

4 95% UCL > Cleanup Limit? YES

5 > 10% above Cleanup Limit? YES

6 Any sample > 2x Cleanup Limit? YES

7

8 Because of the "yes" answers to the WAC 173-340 3-part test for lead and bis(2-ethylhexyl) phthalate, additional
 9 evaluation of attainment of cleanup criteria will be performed.

10

11 Relative Percent Difference Results^{a,b} -

Analyte	Staging Pile
	Duplicate Analysis
Potassium-40	32%
Aluminum	4%
Barium	3%
Calcium	3%
Chromium	7%
Copper	5%
Iron	3%
Magnesium	2%
Manganese	0%
Silicon	58%
Vanadium	3%
Zinc	0%

26 ^aRelative percent difference evaluation was not required for analytes not included in this table.27 ^bThe significance of relative percent difference values are discussed within the RSVP for the subject site.

28

29

30 BCL = below cleanup level

31 CLARC = Cleanup Levels and Risk Calculations

32 COC = contaminant of concern

33 COPC = contaminant of potential concern

34 DE = direct exposure

35 GEA = gamma energy analysis

36 GW = groundwater

37 QA/QC = quality assurance/quality control

38 MDA = minimum detectable activity

39

RAG = remedial action goal

RDR/RAWP = Remedial Design Report/Remedial Action Work Plan

RPD = relative percent difference

RSVP = remaining sites verification package

SAP = Sampling and Analysis Plan

TDL = target detection limit

U = undetected

UCL = upper confidence limit

CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel *LH* Date 05/21/08 Calc. No. 0100F-CA-V0364 Rev. No. 0
 Project 100-F Field Remediation Job No. 14655 Checked H. M. Suiloway *HMS* Date 05/21/08
 Subject 100-F-26:9 Staging Pile Cleanup Verification 95% UCL Calculation Sheet No. 3 of 11

1 Summary (continued)

2 **Methodology (continued):**

3 For quality assurance/quality control (QA/QC) split and duplicate RPD calculations, a value less than 30% indicates the data
 4 compare favorably. For regulatory splits, a threshold of 35% is used (EPA 1994). If the RPD is greater than 30% (or 35% for
 5 regulatory split data), further investigation regarding the usability of the data is performed. No split samples were collected for
 6 cleanup verification of the subject site. Additional discussion is provided in the data quality assessment section of the applicable
 7 RSVP, as necessary.
 8

9 **Results:**

10 The results presented in the tables that follow include the summary of the results of the 95% UCL calculations or the maximum
 11 value, 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
 12 for this site.
 13

14 **Results Summary^a**

Analyte	Staging Pile ^b	Units
Arsenic	6.7	mg/kg
Barium	58.7	mg/kg
Beryllium	0.46	mg/kg
Boron	1.8	mg/kg
Chromium	10.4	mg/kg
Hexavalent Chromium	0.23	mg/kg
Cobalt	5.8	mg/kg
Copper	15.5	mg/kg
Lead	20.2	mg/kg
Manganese	264	mg/kg
Mercury	0.12	mg/kg
Molybdenum	0.75	mg/kg
Nickel	11.1	mg/kg
Vanadium	30.6	mg/kg
Zinc	36.3	mg/kg
Aroclor-1254	23	ug/kg
Aroclor-1260	19	ug/kg
TPH	418	mg/kg
Dichlorodiphenyldichloroethylene	2.9	ug/kg
Endrin ketone	2.6	ug/kg
gamma-Chlordane	2.6	ug/kg
Anthracene	26	ug/kg
Benzo(a)anthracene	120	ug/kg
Benzo(a)pyrene	140	ug/kg
Benzo(b)fluoranthene	75	ug/kg
Benzo(ghi)perylene	87	ug/kg
Benzo(k)fluoranthene	120	ug/kg
Bis(2-ethylhexyl) phthalate	245	ug/kg
Chrysene	160	ug/kg
Di-n-butylphthalate	26	ug/kg
Fluoranthene	200	ug/kg
Indeno(1,2,3-cd)pyrene	83	ug/kg
Phenanthrene	150	ug/kg
Pyrene	260	ug/kg

55 ^aNo detections were reported in any data set for COCs/COPCs not listed in this table.

56 ^bMaximum or 95% UCL result, depending on data censorship, as described in the calculation methodology.

CALCULATION SHEET

Washington Closure Hanford

Originator	L. D. Habel	Date	05/21/08	Calc. No.	0100F-CA-V0364	Rev. No.	0
Project	100-F Field Remediation	Job No.	14655	Checked	H. M. Sulloway	Date	05/21/08
Subject	100-F-26:9 Staging Pile Cleanup Verification 95% UCL Calculation			Sheet No.	2 of 11		

Summary (continued)

UCL Methodology:

For nonradioactive analytes with $\leq 50\%$ of the data below detection limits and all detected radionuclide analytes, 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, the maximum detected value for the data set is used instead of the 95% UCL. The 95% UCL is not calculated for data sets with no reported detections. The evaluation of the portion of each analyte's data set below detection limits was performed by direct inspection of the attached sample results, and no further calculations were performed for those data sets where $> 50\%$ of the data was below detection limits.

Calculated cleanup levels are not available in Ecology (2005) under WAC 173-340-740(3) for:

aluminum, calcium, iron, magnesium, potassium, silicon, and sodium;

therefore, these constituents are not considered site COPCs and are also not included in these tables.

The 95% UCL values were not calculated for radium-226, radium-228, thorium-228, thorium-232, and potassium-40, as these isotopes are excluded from consideration as COCs based on natural occurrence and analogous site information.

All nonradionuclide data reported as being undetected are set to $\frac{1}{2}$ the detection limit value for calculation of the statistics (Ecology 1993). 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 ($n < 10$) and all radionuclide data sets, 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 and calculation of the 95% UCL is done using Ecology's MTCASat software (Ecology 1993). Due to differences in addressing censored data between the RDR/RAWP (DOE-RL 2005b) and MTCASat coding and due to a limitation in the MTCASat 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 input 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,
- 2) greater than 10% of the raw data exceed the most stringent cleanup limit for each COPC,
- 3) the maximum value of the raw data set exceeds two times the most stringent cleanup limit for each COPC.

The WAC 173-340-740(7)(e) 3-part test is not performed for COPCs where the statistical value defaults to the maximum value in the data set. Instead, direct comparison of the maximum value against site remedial action goals (RAGs) (within the RSVP) is used as the compliance basis.

The RPD values are evaluated for analytes detected in a primary-duplicate or primary-split sample pair for the purposes of data quality assessment within the CVP. The RPD is calculated when both the primary value and the duplicate value for a given analyte are above detection limits and are greater than 5 times the target detection limit (TDL). The RPD calculations use the following formula:

$$RPD = \frac{|M-S|}{((M+S)/2)} * 100$$

where, M = main sample value S = split (or duplicate) sample value

For quality assurance/quality control (QA/QC) split and duplicate RPD calculations, a value less than 30% indicates the data compare favorably. For regulatory splits, a threshold of 35% is used (EPA 1994). If the RPD is greater than 30% (or 35% for regulatory split data), 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 results exceed a control limit of 2 times the TDL, further assessment regarding the usability of the data is performed. Additional discussion is provided in the data quality assessment section of the applicable RSVP, as necessary.

CALCULATION SHEET

Washington Closure HanfordOriginator L. D. HabelDate 05/21/08Calc. No. 0100F-CA-V0364Rev. No. 0Project 100-F Field RemediationJob No. 14655Checked H. M. SullowayDate 05/21/08Subject 100-F-26:9 Staging Pile Cleanup Verification 95% UCL CalculationSheet No. 1 of 11**Summary****Purpose:**

Calculate the 95% upper confidence limit (UCL) values to evaluate compliance with cleanup standards for the shallow zone excavation of the subject site. Also, perform the Washington Administrative Code (WAC) 173-340-740(7)(e) 3-part test for nonradionuclide contaminants of concern (COCs) and contaminants of potential concern (COPCs) and calculate the relative percent difference (RPD) for primary-duplicate sample pairs, as necessary.

Table of Contents:

Sheets 1 to 4 - Summary
 Sheets 5 to 6 - Staging Pile Statistical Calculations
 Sheet 7 to 10 - Ecology Software (MTCStat) Results (Staging Pile)
 Sheet 11 - Split/Duplicate Analysis (Staging Pile)
 Attachment 1 - Verification Sampling Results (21 sheets)

Given/References:

- 1) Sample Results (Attachment 1).
- 2) Background values and remedial action goals (RAGs) are from DOE-RL (1996), DOE-RL (2001), DOE-RL (2005b) and Ecology (2005).
- 3) DOE-RL, 2005a, *100 Area Remedial Action Sampling and Analysis Plan (SAP)*, DOE/RL-96-22, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- 4) DOE-RL, 2005b, *Remedial Design Report/Remedial Action Work Plan for the 100 Area (RDR/RAWP)*, DOE/RL-96-17, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- 5) Ecology, 1992, *Statistical Guidance for Ecology Site Managers*, Publication #92-54, Washington Department of Ecology, Olympia, Washington.
- 6) Ecology, 1993, *Statistical Guidance for Ecology Site Managers*, Supplement S-6, Analyzing Site or Background Data with Below-detection Limit or Below-PQL Values (Censored Data Sets), Publication #92-54, Washington Department of Ecology, Olympia, Washington.
- 6) DOE-RL, 1996, *Hanford Site Background: Part 2, Soil Background for Radioactive Analytes*, DOE/RL-96-12, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- 7) Ecology, 2005, *Cleanup Levels and Risk Calculations (CLARC) Database*, Washington State Department of Ecology, Olympia, Washington, <<https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>>.
- 8) EPA, 1994, *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA 540/R-94/013. U.S. Environmental Protection Agency, Washington, D.C.
- 9) WAC 173-340, 1996, "Model Toxic Control Act - Cleanup," Washington Administrative Code.
- 10) WCH, 2008, *Work Instruction for Verification Sampling of 100-F-26:9, 1607-F2 Sanitary Sewer Pipelines*, 0100F-WI-G0067, Rev. 0. Washington Closure Hanford, Inc., Richland, Washington.

Solution:

Calculation methodology is described in Ecology publication #92-54 (Ecology 1992, 1993), below, and in the RDR/RAWP (DOE-RL 2005b). 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 primary-duplicate sample pairs, as required. 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 data from soil verification samples from the subject waste site. The data were entered into an EXCEL 2003 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 2005b) is documented by this calculation. Duplicate RPD results are used in evaluation of data quality within the RSVP for this site.

This calculation only pertains to the statistically derived sample locations relating to the staging pile footprint (SP) of the 100-F-26:9, 1607-F2 Sanitary Sewer Pipelines (WCH 2008).

CALCULATION COVER SHEETProject Title: 100-F Field RemediationJob No. **14655**Area: 100-FDiscipline: Environmental*Calculation No: 0100F-CA-V0364Subject: 100-F-26:9 Staging Pile Cleanup Verification 95% UCL CalculationComputer Program: ExcelProgram No: Excel 2003

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	Total = 33	L. D. Habel	H. M. Sulloway	NA	J. D. Fancher	4/27/06

SUMMARY OF REVISION

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Naphthalene			Nitrobenzene			Pentachlorophenol			Phenanthrene			Phenol			Pyrene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
SP-1	J16961	2/12/08	370	U	370	370	U	370	920	U	920	370	U	370	370	U	370	370	U	370
SP-2	J16962	2/12/08	360	U	360	360	U	360	910	U	910	360	U	360	360	U	360	360	U	360
SP-3	J16963	2/12/08	360	U	360	360	U	360	900	U	900	150	J	360	360	U	360	260	J	360
SP-4	J16964	2/12/08	360	U	360	360	U	360	910	U	910	22	J	360	360	U	360	42	J	360
SP-5	J16965	2/12/08	370	U	370	370	U	370	930.0	U	930	370	U	370	370	U	370	370	U	370
SP-6	J16966	2/12/08	390	U	390	390	U	390	970	U	970	390	U	390	390	U	390	390	U	390
SP-7	J16967	2/12/08	380	U	380	380	U	380	940	U	940	380	U	380	380	U	380	380	U	380
SP-8	J16968	2/12/08	380	U	380	380	U	380	950	U	950	380	U	380	380	U	380	380	U	380
SP-9	J16969	2/12/08	380	U	380	380	U	380	960	U	960	380	U	380	380	U	380	380	U	380
SP-10	J16970	2/12/08	370	U	370	370	U	370	920	U	920	370	U	370	370	U	370	370	U	370
Dup. of SP-10	J16971	2/12/08	370	U	370	370	U	370	940	U	940	370	U	370	370	U	370	370	U	370

Attachment

Originator

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L. D. Habel

H. M. Sulloway

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Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Hexachlorocyclopentadiene			Hexachloroethane			Indeno(1,2,3-cd)pyrene			Isophorone			N-Nitroso-di-n-dipropylamine			N-Nitrosodiphenylamine		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
SP-1	J16961	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
SP-2	J16962	2/12/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
SP-3	J16963	2/12/08	360	U	360	360	U	360	83	J	360	360	U	360	360	U	360	360	U	360
SP-4	J16964	2/12/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
SP-5	J16965	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
SP-6	J16966	2/12/08	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390
SP-7	J16967	2/12/08	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380
SP-8	J16968	2/12/08	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380
SP-9	J16969	2/12/08	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380
SP-10	J16970	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
Dup. of SP-10	J16971	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370

Attachment

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Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Fluoranthene			Fluorene			Hexachlorobenzene			Hexachlorobutadiene		
			ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
SP-1	J16961	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370
SP-2	J16962	2/12/08	360	U	360	360	U	360	360	U	360	360	U	360
SP-3	J16963	2/12/08	200	J	360	360	U	360	360	U	360	360	U	360
SP-4	J16964	2/12/08	28	J	360	360	U	360	360	U	360	360	U	360
SP-5	J16965	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370
SP-6	J16966	2/12/08	390	U	390	390	U	390	390	U	390	390	U	390
SP-7	J16967	2/12/08	380	U	380	380	U	380	380	U	380	380	U	380
SP-8	J16968	2/12/08	380	U	380	380	U	380	380	U	380	380	U	380
SP-9	J16969	2/12/08	380	U	380	380	U	380	380	U	380	380	U	380
SP-10	J16970	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370
Dup. of SP-10	J16971	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370

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Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Chrysene			Di-n-butylphthalate			Di-n-octylphthalate			Dibenz[a,h]anthracene			Dibenzofuran			Diethylphthalate			Dimethyl phthalate		
			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
SP-1	J16961	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
SP-2	J16962	2/12/08	360	U	360	22	J	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
SP-3	J16963	2/12/08	160	J	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
SP-4	J16964	2/12/08	25	J	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
SP-5	J16965	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
SP-6	J16966	2/12/08	390	U	390	26	J	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390
SP-7	J16967	2/12/08	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380
SP-8	J16968	2/12/08	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380
SP-9	J16969	2/12/08	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380
SP-10	J16970	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
Dup. of SP-10	J16971	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370

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Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Benzo(k)fluoranthene			Bis(2-chloro-1-methylethyl)ether			Bis(2-Chloroethoxy)methane			Bis(2-chloroethyl) ether			Bis(2-ethylhexyl) phthalate			Butylbenzylphthalate			Carbazole		
			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
SP-1	J16961	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370	510	B	370	370	U	370	370	U	370
SP-2	J16962	2/12/08	360	U	360	360	U	360	360	U	360	360	U	360	59	JB	360	360	U	360	360	U	360
SP-3	J16963	2/12/08	120	J	360	360	U	360	360	U	360	360	U	360	61	JB	360	360	U	360	360	U	360
SP-4	J16964	2/12/08	360	U	360	360	U	360	360	U	360	360	U	360	110	JB	360	360	U	360	360	U	360
SP-5	J16965	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370	110	JB	370	370	U	370	370	U	370
SP-6	J16966	2/12/08	390	U	390	390	U	390	390	U	390	390	U	390	89	JB	390	390	U	390	390	U	390
SP-7	J16967	2/12/08	380	U	380	380	U	380	380	U	380	380	U	380	410	B	380	380	U	380	380	U	380
SP-8	J16968	2/12/08	380	U	380	380	U	380	380	U	380	380	U	380	150	JB	380	380	U	380	380	U	380
SP-9	J16969	2/12/08	380	U	380	380	U	380	380	U	380	380	U	380	46	JB	380	380	U	380	380	U	380
SP-10	J16970	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370	58	JB	370	370	U	370	370	U	370
Dup. of SP-10	J16971	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370	67	JB	370	370	U	370	370	U	370

Attachment

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Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Acenaphthene			Acenaphthylene			Anthracene			Benzo(a)anthracene			Benzo(a)pyrene			Benzo(b)fluoranthene			Benzo(ghi)perylene		
			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
SP-1	J16961	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
SP-2	J16962	2/12/08	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360	360	U	360
SP-3	J16963	2/12/08	360	U	360	360	U	360	26	J	360	120	J	360	140	J	360	75	J	360	87	J	360
SP-4	J16964	2/12/08	360	U	360	360	U	360	360	U	360	21	J	360	360	U	360	360	U	360	360	U	360
SP-5	J16965	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
SP-6	J16966	2/12/08	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390	390	U	390
SP-7	J16967	2/12/08	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380
SP-8	J16968	2/12/08	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380
SP-9	J16969	2/12/08	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380	380	U	380
SP-10	J16970	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370
Dup. of SP-10	J16971	2/12/08	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370	370	U	370

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Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	4,6-Dinitro-2-methylphenol			4-Bromophenylphenyl ether			4-Chloro-3-methylphenol			4-Chloroaniline			4-Chlorophenylphenyl ether			4-Nitroaniline			4-Nitrophenol		
			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
SP-1	J16961	2/12/08	920	U	920	370	U	370	370	U	370	370	U	370	370	U	370	920	U	920	920	U	920
SP-2	J16962	2/12/08	910	U	910	360	U	360	360	U	360	360	U	360	360	U	360	910	U	910	910	U	910
SP-3	J16963	2/12/08	900	U	900	360	U	360	360	U	360	360	U	360	360	U	360	900	U	900	900	U	900
SP-4	J16964	2/12/08	910	U	910	360	U	360	360	U	360	360	U	360	360	U	360	910	U	910	910	U	910
SP-5	J16965	2/12/08	930	U	930	370	U	370	370	U	370	370	U	370	370	U	370	930	U	930	930	U	930
SP-6	J16966	2/12/08	970	U	970	390	U	390	390	U	390	390	U	390	390	U	390	970	U	970	970	U	970
SP-7	J16967	2/12/08	940	U	940	380	U	380	380	U	380	380	U	380	380	U	380	940	U	940	940	U	940
SP-8	J16968	2/12/08	950	U	950	380	U	380	380	U	380	380	U	380	380	U	380	950	U	950	950	U	950
SP-9	J16969	2/12/08	960	U	960	380	U	380	380	U	380	380	U	380	380	U	380	960	U	960	960	U	960
SP-10	J16970	2/12/08	920	U	920	370	U	370	370	U	370	370	U	370	370	U	370	920	U	920	920	U	920
Dup. of SP-10	J16971	2/12/08	940	U	940	370	U	370	370	U	370	370	U	370	370	U	370	940	U	940	940	U	940

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Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	2-Methylnaphthalene			2-Methylphenol (cresol, o-)			2-Nitroaniline			2-Nitrophenol			3+4 Methylphenol (cresol, m+p)			3,3'-Dichlorobenzidine			3-Nitroaniline		
			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
SP-1	J16961	2/12/08	370	U	370	370	U	370	920	U	920	370	U	370	370	U	370	370	U	370	920	U	920
SP-2	J16962	2/12/08	360	U	360	360	U	360	910	U	910	360	U	360	360	U	360	360	U	360	910	U	910
SP-3	J16963	2/12/08	360	U	360	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360	900	U	900
SP-4	J16964	2/12/08	360	U	360	360	U	360	910	U	910	360	U	360	360	U	360	360	U	360	910	U	910
SP-5	J16965	2/12/08	370	U	370	370	U	370	930	U	930	370	U	370	370	U	370	370	U	370	930	U	930
SP-6	J16966	2/12/08	390	U	390	390	U	390	970	U	970	390	U	390	390	U	390	390	U	390	970	U	970
SP-7	J16967	2/12/08	380	U	380	380	U	380	940	U	940	380	U	380	380	U	380	380	U	380	940	U	940
SP-8	J16968	2/12/08	380	U	380	380	U	380	950	U	950	380	U	380	380	U	380	380	U	380	950	U	950
SP-9	J16969	2/12/08	380	U	380	380	U	380	960	U	960	380	U	380	380	U	380	380	U	380	960	U	960
SP-10	J16970	2/12/08	370	U	370	370	U	370	920	U	920	370	U	370	370	U	370	370	U	370	920	U	920
Dup. of SP-10	J16971	2/12/08	370	U	370	370	U	370	940	U	940	370	U	370	370	U	370	370	U	370	940	U	940

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Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	2,4-Dichlorophenol			2,4-Dimethylphenol			2,4-Dinitrophenol			2,4-Dinitrotoluene			2,6-Dinitrotoluene			2-Chloronaphthalene			2-Chlorophenol		
			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
SP-1	J16961	2/12/08	370	U	370	370	U	370	920	U	920	370	U	370	370	U	370	370	U	370	370	U	370
SP-2	J16962	2/12/08	360	U	360	360	U	360	910	U	910	360	U	360	360	U	360	360	U	360	360	U	360
SP-3	J16963	2/12/08	360	U	360	360	U	360	900	U	900	360	U	360	360	U	360	360	U	360	360	U	360
SP-4	J16964	2/12/08	360	U	360	360	U	360	910	U	910	360	U	360	360	U	360	360	U	360	360	U	360
SP-5	J16965	2/12/08	370	U	370	370	U	370	930	U	930	370	U	370	370	U	370	370	U	370	370	U	370
SP-6	J16966	2/12/08	390	U	390	390	U	390	970	U	970	390	U	390	390	U	390	390	U	390	390	U	390
SP-7	J16967	2/12/08	380	U	380	380	U	380	940	U	940	380	U	380	380	U	380	380	U	380	380	U	380
SP-8	J16968	2/12/08	380	U	380	380	U	380	950	U	950	380	U	380	380	U	380	380	U	380	380	U	380
SP-9	J16969	2/12/08	380	U	380	380	U	380	960	U	960	380	U	380	380	U	380	380	U	380	380	U	380
SP-10	J16970	2/12/08	370	U	370	370	U	370	920	U	920	370	U	370	370	U	370	370	U	370	370	U	370
Dup. of SP-10	J16971	2/12/08	370	U	370	370	U	370	940	U	940	370	U	370	370	U	370	370	U	370	370	U	370

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Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Toxaphene			1,2,4-Trichlorobenzene			1,2-Dichlorobenzene			1,3-Dichlorobenzene			1,4-Dichlorobenzene			2,4,5-Trichlorophenol			2,4,6-Trichlorophenol		
			ug/Kg	Q	PQL	#N/A	Q	PQL	#N/A	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL	ug/Kg	Q	PQL
SP-1	J16961	2/12/08	15	UD	15	370	U	370	370	U	370	370	U	370	370	U	370	920	U	920	370	U	370
SP-2	J16962	2/12/08	15	UD	15	360	U	360	360	U	360	360	U	360	360	U	360	910	U	910	360	U	360
SP-3	J16963	2/12/08	14	UD	14	360	U	360	360	U	360	360	U	360	360	U	360	900	U	900	360	U	360
SP-4	J16964	2/12/08	15	UD	15	360	U	360	360	U	360	360	U	360	360	U	360	910	U	910	360	U	360
SP-5	J16965	2/12/08	15	UD	15	370	U	370	370	U	370	370	U	370	370	U	370	930	U	930	370	U	370
SP-6	J16966	2/12/08	15	UD	15	390	U	390	390	U	390	390	U	390	390	U	390	970	U	970	390	U	390
SP-7	J16967	2/12/08	15	UD	15	380	U	380	380	U	380	380	U	380	380	U	380	940	U	940	380	U	380
SP-8	J16968	2/12/08	15	UD	15	380	U	380	380	U	380	380	U	380	380	U	380	950	U	950	380	U	380
SP-9	J16969	2/12/08	15	UD	15	380	U	380	380	U	380	380	U	380	380	U	380	960	U	960	380	U	380
SP-10	J16970	2/12/08	15	UD	15	370	U	370	370	U	370	370	U	370	370	U	370	920	U	920	370	U	370
Dup. of SP-10	J16971	2/12/08	15	UD	15	370	U	370	370	U	370	370	U	370	370	U	370	940	U	940	370	U	370

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Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Endrin aldehyde			Endrin ketone			Gamma-BHC (Lindane)			gamma-Chlordane			Heptachlor			Heptachlor epoxide			Methoxychlor		
			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
SP-1	J16961	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-2	J16962	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-3	J16963	2/12/08	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
SP-4	J16964	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-5	J16965	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-6	J16966	2/12/08	1.5	UD	1.5	2.6	JD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-7	J16967	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-8	J16968	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-9	J16969	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	2.6	JD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-10	J16970	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
Dup. of SP-10	J16971	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5

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Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Dichlorodiphenyldichloroethylene			Dichlorodiphenyltrichloroethane			Dieldrin			Endosulfan I			Endosulfan II			Endosulfan sulfate			Endrin		
			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
SP-1	J16961	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-2	J16962	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-3	J16963	2/12/08	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4
SP-4	J16964	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-5	J16965	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-6	J16966	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-7	J16967	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-8	J16968	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-9	J16969	2/12/08	2.9	JD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-10	J16970	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
Dup. of SP-10	J16971	2/12/08	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5

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Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	TPH			Aldrin			Alpha-BHC			alpha-Chlordane			beta-1,2,3,4,5,6-Hexachlorocyclohexane			Delta-BHC			Dichlorodiphenyldichloroethane		
			mg/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
SP-1	J16961	2/12/08	147	U	147	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-2	J16962	2/12/08	145	U	145	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-3	J16963	2/12/08	143	U	143	1.4	UD	1.4	1.4	UD	1.4	1.4	UD	1.4	3.9	JD	3.9	1.4	UD	1.4	1.4	UD	1.4
SP-4	J16964	2/12/08	145	U	145	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-5	J16965	2/12/08	149	U	149	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-6	J16966	2/12/08	418		154	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-7	J16967	2/12/08	150	U	150	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-8	J16968	2/12/08	152	U	152	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-9	J16969	2/12/08	153	U	153	1.5	UD	1.5	1.5	UD	1.5	2.7	JD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
SP-10	J16970	2/12/08	146	U	146	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5
Dup. of SP-10	J16971	2/12/08	149	U	149	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5	1.5	UD	1.5

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Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Aroclor-1016			Aroclor-1221			Aroclor-1232			Aroclor-1242			Aroclor-1248			Aroclor-1254			Aroclor-1260		
			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
SP-1	J16961	2/12/08	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15
SP-2	J16962	2/12/08	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15
SP-3	J16963	2/12/08	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14	14	U	14
SP-4	J16964	2/12/08	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15
SP-5	J16965	2/12/08	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15
SP-6	J16966	2/12/08	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15
SP-7	J16967	2/12/08	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	23	J	15	19		15
SP-8	J16968	2/12/08	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15
SP-9	J16969	2/12/08	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15
SP-10	J16970	2/12/08	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15
Dup. of SP-10	J16971	2/12/08	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15	15	U	15

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Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Silicon			Silver			Sodium			Vanadium			Zinc		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SP-1	J16961	2/12/08	220		10.7	0.27	U	0.27	119	C	5.4	26.4		0.38	32.4	C	1.6
SP-2	J16962	2/12/08	207		9.8	0.25	U	0.25	122	C	4.9	28.2		0.34	30.9	C	1.5
SP-3	J16963	2/12/08	196		10.0	0.25	U	0.25	149	C	5.0	29.4		0.35	37.4	C	1.5
SP-4	J16964	2/12/08	209		9.9	0.25	U	0.25	115	C	5.0	25.2		0.35	32.3	C	1.5
SP-5	J16965	2/12/08	189		10.5	0.26	U	0.26	143	C	5.2	33.1		0.37	38.3	C	1.6
SP-6	J16966	2/12/08	242		9.7	0.24	U	0.24	223	C	4.8	29.5		0.34	38.4	C	1.5
SP-7	J16967	2/12/08	193		11.4	0.28	U	0.28	131	C	5.7	33.7		0.40	35.7	C	1.7
SP-8	J16968	2/12/08	259		8.9	0.22	U	0.22	119	C	4.5	27.1		0.31	32.8	C	1.3
SP-9	J16969	2/12/08	279		11.5	0.29	U	0.29	118	C	5.8	28.1		0.40	38.0	C	1.7
SP-10	J16970	2/12/08	213		10.5	0.26	U	0.26	121	C	5.2	28.8		0.37	30.7	C	1.6
Dup. of SP-10	J16971	2/12/08	117		7.0	0.17	U	0.17	116	C	3.5	29.8		0.24	30.7	C	1.0

Attachment

Originator

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L. D. Habel

H. M. Sulloway

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Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Magnesium			Manganese			Mercury			Molybdenum			Nickel			Potassium			Selenium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
SP-1	J16961	2/12/08	3460		6.7	240	C	0.11	0.01	U	0.01	0.80	U	0.80	10.3		0.54	1030		132	1.6	U	1.6
SP-2	J16962	2/12/08	3470		6.1	236	C	0.10	0.009	U	0.009	0.75		0.74	10.4		0.49	929		121	1.5	U	1.5
SP-3	J16963	2/12/08	3510		6.3	230	C	0.10	0.02		0.008	0.75	U	0.75	9.9		0.50	897		123	1.5	U	1.5
SP-4	J16964	2/12/08	3340		6.2	228	C	0.10	0.009	U	0.009	0.74	U	0.74	10.0		0.50	941		122	1.5	U	1.5
SP-5	J16965	2/12/08	4300		6.5	268	C	0.10	0.01	U	0.01	0.79	U	0.79	11.7		0.52	1130		129	1.6	U	1.6
SP-6	J16966	2/12/08	3930		6.0	268	C	0.10	0.12		0.009	0.73	U	0.73	10.8		0.48	1300		119	1.5	U	1.5
SP-7	J16967	2/12/08	4210		7.1	267	C	0.11	0.009	U	0.009	0.86	U	0.86	12.0		0.57	1140		140	1.7	U	1.7
SP-8	J16968	2/12/08	3730		4.5	261	C	0.09	0.01	U	0.01	0.67	U	0.67	10.1		0.45	1180		110	1.3	U	1.3
SP-9	J16969	2/12/08	3660		7.2	285	C	0.12	0.01	U	0.01	0.86	U	0.86	10.8		0.58	1180		142	1.7	U	1.7
SP-10	J16970	2/12/08	3690		6.5	233	C	0.10	0.01	U	0.01	0.78	U	0.78	11.5		0.52	911		129	1.6	U	1.6
Dup. of SP-10	J16971	2/12/08	3630		4.4	233	C	0.07	0.008	U	0.008	0.52	U	0.52	10.6		0.35	808		86.0	1.0	U	1.0

Attachment

Originator

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L. D. Habel

H. M. Sulloway

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Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Calcium			Chromium			Hexavalent Chromium			Cobalt			Copper			Iron			Lead		
			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
SP-1	J16961	2/12/08	3480	C	10.7	9.5	C	0.54	0.22	U	0.22	5.4		0.54	13.7		0.62	14500		12.1	4.0		0.80
SP-2	J16962	2/12/08	4000	C	9.8	8.5	C	0.49	0.22	U	0.22	5.5		0.49	13.5		0.57	13700		11.1	5.4		0.74
SP-3	J16963	2/12/08	4680	C	10.0	10.4	C	0.50	0.36		0.22	5.2		0.50	16.5		0.58	14200		11.3	6.9		0.75
SP-4	J16964	2/12/08	3600	C	9.9	8.7	C	0.50	0.23		0.22	5.0		0.50	12.7		0.57	13200		11.3	4.8		0.74
SP-5	J16965	2/12/08	3820	C	10.5	11.0	C	0.52	0.27		0.22	6.1		0.52	14.9		0.60	16700		11.8	60.1		0.79
SP-6	J16966	2/12/08	5430	C	9.7	11.0	C	0.48	0.26		0.23	5.7		0.48	13.3		0.56	15000		10.9	11.2		0.73
SP-7	J16967	2/12/08	4120	C	11.4	10.7	C	0.57	0.23	U	0.23	6.1		0.57	17.2		0.66	16200		12.8	4.6		0.86
SP-8	J16968	2/12/08	3710	C	8.9	8.9	C	0.45	0.23	U	0.23	5.6		0.45	12.9		0.51	14000		10.0	5.4		0.67
SP-9	J16969	2/12/08	3760	C	11.5	10.4	C	0.58	0.23	U	0.23	5.8		0.58	15.4		0.66	14600		13.0	5.6		0.86
SP-10	J16970	2/12/08	3270	C	10.5	9.4	C	0.52	0.24		0.22	5.4		0.52	15.6		0.60	14400		11.8	4.1		0.78
Dup. of SP-10	J16971	2/12/08	3370	C	7.0	8.8	C	0.35	0.22	U	0.22	5.7		0.35	14.9		0.40	14800		7.9	4.1		0.52

Attachment	1	Sheet No.	5 of 21
Originator	L. D. Habel	Date	05/21/08
Checked	H. M. Sulloway	Date	
Calc. No.	0100F-CA-V0364	Rev. No.	0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Aluminum			Antimony			Arsenic			Barium			Beryllium			Boron			Cadmium		
			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
SP-1	J16961	2/12/08	5850		10.7	0.80	U	0.80	1.6		1.3	52.1		0.27	0.38		0.13	1.3	U	1.3	0.13	U	0.13
SP-2	J16962	2/12/08	5520		9.8	0.74	U	0.74	3.1		1.2	46.7		0.25	0.41		0.12	1.2	U	1.2	0.12	U	0.12
SP-3	J16963	2/12/08	5250		10.0	0.75	U	0.75	2.7		1.3	49.1		0.25	0.39		0.13	1.3	U	1.3	0.13	U	0.13
SP-4	J16964	2/12/08	5270		9.9	0.74	U	0.74	2.6		1.2	46.2		0.25	0.37		0.12	1.2	U	1.2	0.12	U	0.12
SP-5	J16965	2/12/08	7480		10.5	0.79	U	0.79	18.3		1.3	66.3		0.26	0.51		0.13	1.3	U	1.3	0.13	U	0.13
SP-6	J16966	2/12/08	6260		9.7	0.73	U	0.73	2.7		1.2	66.2		0.24	0.45		0.12	1.8		1.2	0.12	U	0.12
SP-7	J16967	2/12/08	6770		11.4	0.86	U	0.86	2.3		1.4	52.0		0.28	0.48		0.14	1.4	U	1.4	0.14	U	0.14
SP-8	J16968	2/12/08	5730		8.9	0.67	U	0.67	2.7		1.1	55.6		0.22	0.44		0.11	1.5		1.1	0.11	U	0.11
SP-9	J16969	2/12/08	6020		11.5	0.86	U	0.86	2.8		1.4	63.8		0.29	0.46		0.14	1.4	U	1.4	0.14	U	0.14
SP-10	J16970	2/12/08	5760		10.5	0.78	U	0.78	2.4		1.3	45.0		0.26	0.44		0.13	1.3	U	1.3	0.13	U	0.13
Dup. of SP-10	J16971	2/12/08	5520		7.0	0.52	U	0.52	2.5		0.87	46.2		0.17	0.46		0.09	0.87	U	0.87	0.09	U	0.09

Attachment	1	Sheet No.	4 of 21
Originator	L. D. Habel	Date	05/21/08
Checked	H. M. Sulloway	Date	
Calc. No.	0100F-CA-V0364	Rev. No.	0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Uranium-238			Gross alpha			Gross beta		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SP-1	J16961	2/12/08	3.9	U	3.9	13.5		6.63	17.6		6.07
SP-2	J16962	2/12/08	5.0	U	5.0	11.0		8.13	23.7		9.15
SP-3	J16963	2/12/08	3.1	U	3.1	3.45	U	6.70	12.6		5.63
SP-4	J16964	2/12/08	3.8	U	3.8	16.3		8.94	21.1		5.39
SP-5	J16965	2/12/08	11.4	U	11.4	12.3		7.43	20.8		8.76
SP-6	J16966	2/12/08	11.5	U	11.5	10.5		5.33	18.9		5.53
SP-7	J16967	2/12/08	6.4	U	6.4	6.41	U	7.20	16.5		6.11
SP-8	J16968	2/12/08	4.1	U	4.1	7.26	U	8.46	24.7		9.25
SP-9	J16969	2/12/08	3.9	U	3.9	8.79		7.11	19.6		5.41
SP-10	J16970	2/12/08	2.5	U	2.5	14.4		6.91	19.7		6.36
Dup. of SP-10	J16971	2/12/08	8.4	U	8.4	9.00		5.96	15.5		5.36

Attachment	1	Sheet No.	3 of 21
Originator	L. D. Habel	Date	05/21/08
Checked	H. M. Sulloway	Date	
Calc. No.	0100F-CA-V0364	Rev. No.	0

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Potassium-40			Radium-226			Radium-228			Silver-108			Thorium-228			Thorium-232			Uranium-235		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SP-1	J16961	2/12/08	14.2		0.345	0.500		0.061	0.780		0.146	0.024	U	0.024	0.693		0.042	0.780		0.146	0.124	U	0.124
SP-2	J16962	2/12/08	6.4		0.440	0.191		0.082	0.584		0.168	0.033	U	0.033	0.490		0.054	0.584		0.168	0.158	U	0.158
SP-3	J16963	2/12/08	13.7		0.302	0.479		0.051	0.732		0.112	0.017	U	0.017	0.638		0.033	0.732		0.112	0.097	U	0.097
SP-4	J16964	2/12/08	12.3		0.349	0.484		0.070	0.680		0.149	0.025	U	0.025	0.678		0.044	0.680		0.149	0.156	U	0.156
SP-5	J16965	2/12/08	11.8		0.926	0.486		0.157	0.751		0.394	0.065	U	0.065	0.907		0.153	0.751		0.394	0.315	U	0.315
SP-6	J16966	2/12/08	12.8		0.746	0.418		0.165	0.526		0.348	0.073	U	0.073	0.779		0.190	0.526		0.348	0.316	U	0.316
SP-7	J16967	2/12/08	13.7		0.531	0.401		0.103	0.634		0.220	0.052	U	0.052	0.831		0.128	0.634		0.220	0.268	U	0.268
SP-8	J16968	2/12/08	13.6		0.347	0.510		0.071	0.722		0.131	0.024	U	0.024	0.825		0.063	0.722		0.131	0.122	U	0.122
SP-9	J16969	2/12/08	11.5		0.304	0.390		0.063	0.627		0.134	0.025	U	0.025	0.897		0.059	0.627		0.134	0.108	U	0.108
SP-10	J16970	2/12/08	13.0		0.184	0.385		0.048	0.727		0.091	0.017	U	0.017	0.753		0.047	0.727		0.091	0.101	U	0.101
Dup. of SP-10	J16971	2/12/08	9.4		0.637	0.301		0.134	0.388		0.315	0.053	U	0.053	0.516		0.084	0.388		0.315	0.231	U	0.231

Attachment	1	Sheet No.	2 of 21
Originator	L. D. Habel	Date	05/21/08
Checked	H. M. Sulloway	Date	
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CALCULATION SHEET

Washington Closure Hanford

Originator L. D. Habel
Project 100-F Field Remediation
Subject 100-F-26:9 Staging Pile Cleanup Verification 95% UCL Calculation

Date 05/21/08
Job No. 14655

Calc. No. 0100F-CA-V0364
Checked H. M. Sulloway

Rev. No. 0
Date 05/21/08
Sheet No. 5 of 11

1 100-F-26:12 Excavation Shallow Zone Statistical Calculations

2 Verification Data

Sample Area	Sample Number	Sample Date	Arsenic			Barium			Beryllium			Chromium			Hexavalent Chromium			Cobalt			Copper		
			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
SP-10	J16970	2/12/08	2.4		1.3	45.0		0.26	0.44		0.13	9.4	C	0.5	0.24		0.22	5.4		0.52	15.6		0.60
Dup. of SP-10	J16971	2/12/08	2.5		0.87	46.2		0.17	0.46		0.09	8.8	C	0.4	0.22	U	0.22	5.7		0.35	14.9		0.40
SP-1	J16961	2/12/08	1.6		1.3	52.1		0.27	0.38		0.13	9.5	C	0.5	0.22	U	0.22	5.4		0.54	13.7		0.62
SP-2	J16962	2/12/08	3.1		1.2	46.7		0.25	0.41		0.12	8.5	C	0.5	0.22	U	0.22	5.5		0.49	13.5		0.57
SP-3	J16963	2/12/08	2.7		1.3	49.1		0.25	0.39		0.13	10.4	C	0.5	0.36		0.22	5.2		0.50	16.5		0.58
SP-4	J16964	2/12/08	2.6		1.2	46.2		0.25	0.37		0.12	8.7	C	0.5	0.23		0.22	5.0		0.50	12.7		0.57
SP-5	J16965	2/12/08	18.3		1.3	66.3		0.26	0.51		0.13	11.0	C	0.5	0.27		0.22	6.1		0.52	14.9		0.60
SP-6	J16966	2/12/08	2.7		1.2	66.2		0.24	0.45		0.12	11.0	C	0.5	0.26		0.23	5.7		0.48	13.3		0.56
SP-7	J16967	2/12/08	2.3		1.4	52.0		0.28	0.48		0.14	10.7	C	0.6	0.23	U	0.23	6.1		0.57	17.2		0.66
SP-8	J16968	2/12/08	2.7		1.1	55.6		0.22	0.44		0.11	8.9	C	0.5	0.23	U	0.23	5.6		0.45	12.9		0.51
SP-9	J16969	2/12/08	2.8		1.4	63.8		0.29	0.46		0.14	10.4	C	0.6	0.23	U	0.23	5.8		0.58	15.4		0.66

16 Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Arsenic mg/kg			Barium mg/kg			Beryllium mg/kg			Chromium mg/kg			Hexavalent Chromium mg/kg			Cobalt mg/kg			Copper mg/kg		
SP-10	J16970/J16971	2/12/08	2.5			45.6			0.45			9.1			0.18			5.6			15.3		
SP-1	J16961	2/12/08	1.6			52.1			0.38			9.5			0.11			5.4			13.7		
SP-2	J16962	2/12/08	3.1			46.7			0.41			8.5			0.11			5.5			13.5		
SP-3	J16963	2/12/08	2.7			49.1			0.39			10.4			0.36			5.2			16.5		
SP-4	J16964	2/12/08	2.6			46.2			0.37			8.7			0.23			5.0			12.7		
SP-5	J16965	2/12/08	18.3			66.3			0.51			11.0			0.27			6.1			14.9		
SP-6	J16966	2/12/08	2.7			66.2			0.45			11.0			0.26			5.7			13.3		
SP-7	J16967	2/12/08	2.3			52.0			0.48			10.7			0.12			6.1			17.2		
SP-8	J16968	2/12/08	2.7			55.6			0.44			8.9			0.12			5.6			12.9		
SP-9	J16969	2/12/08	2.8			63.8			0.46			10.4			0.12			5.8			15.4		

29 Statistical Computations

95% UCL based on	Arsenic			Barium			Beryllium			Chromium			Hexavalent Chromium			Cobalt			Copper		
	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 MTCASat lognormal distribution.			Large data set (n ≥ 10), use MTCASat lognormal distribution.			Large data set (n ≥ 10), lognormal and normal distribution rejected, use Z-statistic.			Large data set (n ≥ 10), use MTCASat lognormal distribution.			Large data set (n ≥ 10), use MTCASat lognormal distribution.		
N	10			10			10			10			10			10			10		
% < Detection Limit	0%			0%			0%			0%			50%			0%			0%		
Mean	4.1			54.4			0.43			9.8			0.19			5.6			14.5		
Standard deviation	5.0			8.3			0.05			1.0			0.09			0.35			1.6		
95% UCL on mean	6.7			58.7			0.46			10.4			0.23			5.8			15.5		
Maximum detected value	18.3			66.3			0.51			11.0			0.36			6.1			17.2		
Final Statistical Value (nonRad)	6.7			58.7			0.46			10.4			0.23			5.8			15.5		
Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg)	20 DE & GW & River Protection			132 GW Protection			1.51 GW & River Protection			18.5 GW & River Protection			2 River Protection			32 GW Protection			22 River Protection		
WAC 173-340 3-PART TEST																					
95% UCL > Cleanup Limit?	NA			NA			NA			NA			NO			NA			NA		
> 10% above Cleanup Limit?	NA			NA			NA			NA			NO			NA			NA		
Any sample > 2X Cleanup Limit?	NA			NA			NA			NA			NO			NA			NA		
WAC 173-340 Compliance?	Yes			Because all values are below background (20 mg/kg), the WAC 173-340 3-part test is not required.			Because all values are below background (132 mg/kg), the WAC 173-340 3-part test is not required.			Because all values are below background (1.51 mg/kg), the WAC 173-340 3-part test is not required.			Because all values are below background (18.5 mg/kg), the WAC 173-340 3-part test is not required.			Yes			Because all values are below background (15.7 mg/kg), the WAC 173-340 3-part test is not required.		

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Washington Closure Hanford

Originator L. D. Habel
Project 100-F Field Remediation
Subject 100-F-26:9 Staging Pile Cleanup Verification 95% UCL Calculation

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Job No. 14655

Calc. No. 0100F-CA-V0364
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1 Split/Duplicate Analysis, Staging Pile

Sample Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Thorium-228			Thorium-232			Gross alpha			Gross beta			Aluminum		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL
SP-10	J16970	2/12/08	13.0		0.184	0.385		0.048	0.727		0.091	0.753		0.047	0.727		0.091	14.4		6.91	19.7		6.36	5760		10.5
Dup. of SP-10	J16971	2/12/08	9.4		0.637	0.301		0.134	0.388		0.315	0.516		0.084	0.388		0.315	9.0		5.96	15.5		5.36	5520		7.0

6 Analysis:

Duplicate Analysis	TDL	0.5	0.1	0.2	1	1	10	15	5
	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No - evaluate difference	No - evaluate difference	No - evaluate difference	No - evaluate difference	No - evaluate difference	No - evaluate difference	Yes (calc RPD)
	RPD	32%							4%
	Difference >2xTDL?	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	Not applicable

Sample Area	Sample Number	Sample Date	Arsenic			Barium			Beryllium			Calcium			Chromium			Hexavalent chromium			Cobalt			Copper		
			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
SP-10	J16970	2/12/08	2.4		1.3	45.0		0.26	0.44		0.13	3270	C	10.5	9.4	C	0.52	0.24		0.22	5.4		0.52	15.6		0.60
Dup. of SP-10	J16971	2/12/08	2.5		0.87	46.2		0.17	0.46		0.09	3370	C	7.0	8.8	C	0.35	0.22	U	0.22	5.7		0.35	14.9		0.40

18 Analysis:

Duplicate Analysis	TDL	10	2	0.5	100	1	0.5	2	1
	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No - evaluate difference	Yes (continue)	Yes (continue)
	Both >5xTDL?	No - evaluate difference	Yes (calc RPD)	No - evaluate difference	Yes (calc RPD)	Yes (calc RPD)		No - evaluate difference	Yes (calc RPD)
	RPD		3%		3%	7%			5%
	Difference >2xTDL?	No - acceptable	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	Not applicable

Sample Area	Sample Number	Sample Date	Iron			Lead			Magnesium			Manganese			Nickel			Potassium			Silicon			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	mg/kg	Q	PQL	mg/kg	Q	PQL
SP-10	J16970	2/12/08	14400		11.8	4.1		0.78	3690		6.5	233	C	0.10	11.5		0.52	911		129	213		10.5	121	C	5.2
Dup. of SP-10	J16971	2/12/08	14800		7.9	4.1		0.52	3630		4.4	233	C	0.07	10.6		0.35	808		86	117		7.0	116	C	3.5

30 Analysis:

Duplicate Analysis	TDL	5	5	75	5	4	400	2	50
	Both > PQL?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	No - evaluate difference	Yes (calc RPD)	Yes (calc RPD)	No - evaluate difference	No - evaluate difference	Yes (calc RPD)	No - evaluate difference
	RPD	3%		2%	0%			58%	
	Difference >2xTDL?	Not applicable	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	Not applicable	No - acceptable

Sample Area	Sample Number	Sample Date	Vanadium			Zinc			Bis(2-ethylhexyl) phthalate		
			mg/kg	Q	PQL	mg/kg	Q	PQL	ug/kg	Q	PQL
SP-10	J16970	2/12/08	28.8		0.37	30.7	C	1.6	58	JB	370
Dup. of SP-10	J16971	2/12/08	29.8		0.24	30.7	C	1.0	67	JB	370

42 Analysis:

Duplicate Analysis	TDL	2.5	1	330
	Both > PQL?	Yes (continue)	Yes (continue)	No - evaluate difference
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	
	RPD	3%	0%	
	Difference >2xTDL?	Not applicable	Not applicable	No - acceptable

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Originator L. D. Habel < X >

Project 100-F Field Remediation

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Ecology Software (MTCASat) - Staging Pile Results

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Originator L. D. Habel
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Ecology Software (MTCASat) - Staging Pile Results

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95% UCL Calculation					
DATA	ID	Manganese			
233	J16970/J16971	Number of samples	Uncensored values		
240	J16961	Uncensored	10	Mean	252
236	J16962	Censored	Lognormal mean		
230	J16963	Detection limit or PQL	Std. devn.		
228	J16964	Method detection limit	Median		
268	J16965	TOTAL	10	Min.	228
268	J16966				Max.
267	J16967				
261	J16968				
285	J16969				
		Lognormal distribution?	Normal distribution?		
		r-squared is:	0.901	r-squared is:	0.900
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	264		

95% UCL Calculation					
DATA	ID	Nickel			
11.1	J16970/J16971	Number of samples	Uncensored values		
10.3	J16961	Uncensored	10	Mean	10.7
10.4	J16962	Censored	Lognormal mean		
9.9	J16963	Detection limit or PQL	Std. devn.		
10.0	J16964	Method detection limit	Median		
11.7	J16965	TOTAL	10	Min.	9.9
10.8	J16966				Max.
12.0	J16967				
10.1	J16968				
10.8	J16969				
		Lognormal distribution?	Normal distribution?		
		r-squared is:	0.937	r-squared is:	0.927
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	11.1		

95% UCL Calculation					
DATA	ID	Vanadium			
29.3	J16970/J16971	Number of samples	Uncensored values		
26.4	J16961	Uncensored	10	Mean	29.0
28.2	J16962	Censored	Lognormal mean		
29.4	J16963	Detection limit or PQL	Std. devn.		
25.2	J16964	Method detection limit	Median		
33.1	J16965	TOTAL	10	Min.	25.2
29.5	J16966				Max.
33.7	J16967				
27.1	J16968				
28.1	J16969				
		Lognormal distribution?	Normal distribution?		
		r-squared is:	0.945	r-squared is:	0.930
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	30.6		

95% UCL Calculation					
DATA	ID	Zinc			
30.7	J16970/J16971	Number of samples	Uncensored values		
32.4	J16961	Uncensored	10	Mean	34.7
30.9	J16962	Censored	Lognormal mean		
37.4	J16963	Detection limit or PQL	Std. devn.		
32.3	J16964	Method detection limit	Median		
38.3	J16965	TOTAL	10	Min.	30.7
38.4	J16966				Max.
35.7	J16967				
32.8	J16968				
38.0	J16969				
		Lognormal distribution?	Normal distribution?		
		r-squared is:	0.886	r-squared is:	0.883
		Recommendations:			
		Reject BOTH lognormal and normal distributions.			
		UCL (based on Z-statistic) is	36.3		

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Ecology Software (MTCASat) - Staging Pile Results

95% UCL Calculation					
Hexavalent chromium					
DATA	ID	Number of samples	Uncensored values		
0.18	J16970/J16971				
0.11	J16961	Uncensored	10	Mean	0.19
0.11	J16962	Censored		Lognormal mean	0.19
0.36	J16963	Detection limit or PQL		Std. devn.	0.09
0.23	J16964	Method detection limit		Median	0.15
0.27	J16965	TOTAL	10	Min.	0.11
0.26	J16966			Max.	0.36
0.12	J16967				
0.12	J16968				
0.12	J16969				
Lognormal distribution?		Normal distribution?			
r-squared is:		0.853	r-squared is:	0.842	
Recommendations:					
Reject BOTH lognormal and normal distributions.					
UCL (based on Z-statistic) is		0.23			

95% UCL Calculation					
Cobalt					
DATA	ID				
5.6	J16970/J16971	Number of samples		Uncensored values	
5.4	J16961	Uncensored	10	Mean	5.6
5.5	J16962	Censored		Lognormal mean	5.6
5.2	J16963	Detection limit or PQL		Std. devn.	0.35
5.0	J16964	Method detection limit		Median	5.6
6.1	J16965	TOTAL	10	Min.	5.0
5.7	J16966			Max.	6.1
6.1	J16967				
5.6	J16968				
5.8	J16969				
		Lognormal distribution?		Normal distribution?	
		r-squared is:	0.971	r-squared is:	0.971
Recommendations:					
Use lognormal distribution.					
		UCL (Land's method) is		5.8	

95% UCL Calculation					
Copper					
15.3	J16970/J16971	Number of samples	Uncensored values		
13.7	J16961	Uncensored	10	Mean	14.5
13.5	J16962	Censored		Lognormal mean	14.5
16.5	J16963	Detection limit or PQL		Std. devn.	1.55
12.7	J16964	Method detection limit		Median	14.3
14.9	J16965	TOTAL	10	Min.	12.7
13.3	J16966			Max.	17.2
17.2	J16967				
12.9	J16968				
15.4	J16969				
		Lognormal distribution?	Normal distribution?		
		r-squared is:	0.948	r-squared is:	0.941
Recommendations:					
Reject BOTH lognormal and normal distributions.					
UCL (Land's method) is			15.5		

95% UCL Calculation					
DATA	ID	Lead			
4.1	J16970/J16971	Number of samples		Uncensored values	
4.0	J16961	Uncensored	10	Mean	11.2
5.4	J16962	Censored		Lognormal mean	9.7
6.9	J16963	Detection limit or PQL		Std. devn.	17.3
4.8	J16964	Method detection limit		Median	5.4
60.1	J16965	TOTAL	10	Min.	4.0
11.2	J16966			Max.	60.1
4.6	J16967				
5.4	J16968				
5.6	J16969				
		Lognormal distribution?		Normal distribution?	
		r-squared is:	0.644	r-squared is:	0.427
Recommendations:					
Reject BOTH lognormal and normal distributions.					
		UCL (based on Z-statistic) is	20.2		

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Ecology Software (MTCStat) - Staging Pile Results

DATA	ID	95% UCL Calculation			
		Arsenic			
2.5	J16970/J16971	Number of samples	Uncensored values		
1.6	J16961	Uncensored	10	Mean	4.1
3.1	J16962	Censored		Lognormal mean	3.8
2.7	J16963	Detection limit or PQL		Std. devn.	5.0
2.6	J16964	Method detection limit		Median	2.7
18.3	J16965	TOTAL	10	Min.	1.6
2.7	J16966			Max.	18.3
2.3	J16967				
2.7	J16968				
2.8	J16969				
		Lognormal distribution?		Normal distribution?	
		r-squared is:	0.570	r-squared is:	0.405
		Recommendations:			
		Reject BOTH lognormal and normal distributions.			
		UCL (based on Z-statistic) is	6.7		

DATA	ID	95% UCL Calculation			
		Barium			
45.6	J16970/J16971	Number of samples	Uncensored values		
52.1	J16961	Uncensored	10	Mean	54.4
46.7	J16962	Censored		Lognormal mean	54.4
49.1	J16963	Detection limit or PQL		Std. devn.	8.3
46.2	J16964	Method detection limit		Median	52.1
66.3	J16965	TOTAL	10	Min.	45.6
66.2	J16966			Max.	66.3
52.0	J16967				
55.6	J16968				
63.8	J16969				
		Lognormal distribution?		Normal distribution?	
		r-squared is:	0.899	r-squared is:	0.883
		Recommendations:			
		Reject BOTH lognormal and normal distributions.			
		UCL (based on Z-statistic) is	58.7		

DATA	ID	95% UCL Calculation			
		Beryllium			
0.45	J16970/J16971	Number of samples	Uncensored values		
0.38	J16961	Uncensored	10	Mean	0.43
0.41	J16962	Censored		Lognormal mean	0.43
0.39	J16963	Detection limit or PQL		Std. devn.	0.05
0.37	J16964	Method detection limit		Median	0.45
0.51	J16965	TOTAL	10	Min.	0.37
0.45	J16966			Max.	0.51
0.48	J16967				
0.44	J16968				
0.46	J16969				
		Lognormal distribution?		Normal distribution?	
		r-squared is:	0.965	r-squared is:	0.967
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	0.46		

DATA	ID	95% UCL Calculation			
		Chromium			
9.1	J16970/J16971	Number of samples	Uncensored values		
9.5	J16961	Uncensored	10	Mean	9.8
8.5	J16962	Censored		Lognormal mean	9.8
10.4	J16963	Detection limit or PQL		Std. devn.	1.0
8.7	J16964	Method detection limit		Median	10.0
11.0	J16965	TOTAL	10	Min.	8.5
11.0	J16966			Max.	11.0
10.7	J16967				
8.9	J16968				
10.4	J16969				
		Lognormal distribution?		Normal distribution?	
		r-squared is:	0.912	r-squared is:	0.912
		Recommendations:			
		Use lognormal distribution.			
		UCL (Land's method) is	10.4		

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Project 100-F Field Remediation

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1 100-F-26:12 Excavation Shallow Zone Statistical Calculations

2 Verification Data

Sample Information Data			Lead			Manganese			Nickel			Vanadium			Zinc			Bis(2-ethylhexyl) phthalate		
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	ug/kg	Q	PQL
SP-10	J16970	2/12/08	4.1		0.78	233	C	0.10	11.5		0.52	28.8		0.37	30.7	C	1.60	58	JB	370
Dup. of SP-10	J16971	2/12/08	4.1		0.52	233	C	0.07	10.6		0.35	29.8		0.24	30.7	C	1.00	67	JB	370
SP-1	J16961	2/12/08	4.0		0.80	240	C	0.11	10.3		0.54	26.4		0.38	32.4	C	1.60	510	B	370
SP-2	J16962	2/12/08	5.4		0.74	236	C	0.10	10.4		0.49	28.2		0.34	30.9	C	1.50	59	JB	360
SP-3	J16963	2/12/08	6.9		0.75	230	C	0.10	9.9		0.50	29.4		0.35	37.4	C	1.50	61	JB	360
SP-4	J16964	2/12/08	4.8		0.74	228	C	0.10	10.0		0.50	25.2		0.35	32.3	C	1.50	110	JB	360
SP-5	J16965	2/12/08	60.1		0.79	268	C	0.10	11.7		0.52	33.1		0.37	38.3	C	1.60	110	JB	370
SP-6	J16966	2/12/08	11.2		0.73	268	C	0.10	10.8		0.48	29.5		0.34	38.4	C	1.50	89	JB	390
SP-7	J16967	2/12/08	4.6		0.86	267	C	0.11	12.0		0.57	33.7		0.40	35.7	C	1.70	410	B	380
SP-8	J16968	2/12/08	5.4		0.67	261	C	0.09	10.1		0.45	27.1		0.31	32.8	C	1.30	150	JB	380
SP-9	J16969	2/12/08	5.6		0.86	285	C	0.12	10.8		0.58	28.1		0.40	38.0	C	1.70	46	JB	380

16 Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Lead mg/kg		Manganese mg/kg		Nickel mg/kg		Vanadium mg/kg		Zinc mg/kg		Bis(2-ethylhexyl) phthalate ug/kg	
SP-10	J16970/J16971	2/12/08	4.1		233		11.1		29.3		30.7		63	
SP-1	J16961	2/12/08	4.0		240		10.3		26.4		32.4		510	
SP-2	J16962	2/12/08	5.4		236		10.4		28.2		30.9		59	
SP-3	J16963	2/12/08	6.9		230		9.9		29.4		37.4		61	
SP-4	J16964	2/12/08	4.8		228		10.0		25.2		32.3		110	
SP-5	J16965	2/12/08	60.1		268		11.7		33.1		38.3		110	
SP-6	J16966	2/12/08	11.2		268		10.8		29.5		38.4		89	
SP-7	J16967	2/12/08	4.6		267		12.0		33.7		35.7		410	
SP-8	J16968	2/12/08	5.4		261		10.1		27.1		32.8		150	
SP-9	J16969	2/12/08	5.6		285		10.8		28.1		38.0		46	

29 Statistical Computations

	95% UCL based on	Lead		Manganese		Nickel		Vanadium		Zinc		Bis(2-ethylhexyl) phthalate	
		Large data set (n ≥10), lognormal and normal distribution rejected, use Z-statistic.		Large data set (n ≥10), use MTCASat lognormal distribution.		Large data set (n ≥10), use MTCASat lognormal distribution.		Large data set (n ≥10), use MTCASat 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.	
30	N	10		10		10		10		10		10	
31	% < Detection limit	0%		0%		0%		0%		0%		0%	
32	Mean	11.2		252		10.7		29.0		34.7		161	
33	Standard deviation	17.3		20.3		0.71		2.7		3.2		162	
34	95% UCL on mean	20.2		264		11.1		30.6		36.3		245	
35	Maximum detected value	60.1		285		12.0		33.7		38.4		510	
36	Final Statistical Value	20.2		264		11.1		30.6		36.3		245	
37	Most Stringent Cleanup Limit for nonradionuclide and RAG type (mg/kg); bis(2-ethylhexyl) phthalate is (ug/kg)	10.2	GW & River Protection	512	GW & River Protection	19.1	GW Protection	85.1	GW Protection	67.8	River Protection	360	River Protection
38	WAC 173-340 3-PART TEST												
39	95% UCL > Cleanup Limit?	YES		NA		NA		NA		NA		NO	
40	> 10% above Cleanup Limit?	YES		NA		NA		NA		NA		YES	
41	Any sample > 2X Cleanup Limit?	YES		NA		NA		NA		NA		NO	
42	WAC 173-340 Compliance?	No	A detailed assessment using RESRAD will be performed for Lead. The data set meets the 3-part test criteria when compared to direct exposure cleanup levels.	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.	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.	A detailed assessment using RESRAD will be performed for Bis(2-ethylhexyl) phthalate. The data set meets the 3-part test criteria when compared to direct exposure cleanup levels.					

Attachment 1. 100-F-26:9 Verification Sampling Results.

Sample Location	HEIS Number	Sample Date	Americium-241 (GEA)			Barium-133			Cesium-137			Cobalt-60			Europium-152			Europium-154			Europium-155		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
SP-1	J16961	2/12/08	0.036	U	0.036	0.036	U	0.036	0.031	U	0.031	0.031	U	0.031	0.079	U	0.079	0.101	U	0.101	0.071	U	0.071
SP-2	J16962	2/12/08	0.040	U	0.040	0.046	U	0.046	0.069	U	0.069	0.043	U	0.043	0.112	U	0.112	0.143	U	0.143	0.088	U	0.088
SP-3	J16963	2/12/08	0.031	U	0.031	0.026	U	0.026	0.022	U	0.022	0.026	U	0.026	0.062	U	0.062	0.089	U	0.089	0.057	U	0.057
SP-4	J16964	2/12/08	0.149	U	0.149	0.044	U	0.044	0.075	U	0.075	0.033	U	0.033	0.093	U	0.093	0.100	U	0.100	0.104	U	0.104
SP-5	J16965	2/12/08	0.355	U	0.355	0.093	U	0.093	0.074	U	0.074	0.088	U	0.088	0.225	U	0.225	0.270	U	0.270	0.214	U	0.214
SP-6	J16966	2/12/08	0.212	U	0.212	0.096	U	0.096	0.098	U	0.098	0.087	U	0.087	0.262	U	0.262	0.306	U	0.306	0.216	U	0.216
SP-7	J16967	2/12/08	0.183	U	0.183	0.067	U	0.067	0.051	U	0.051	0.060	U	0.060	0.157	U	0.157	0.193	U	0.193	0.175	U	0.175
SP-8	J16968	2/12/08	0.134	U	0.134	0.034	U	0.034	0.031	U	0.031	0.034	U	0.034	0.077	U	0.077	0.114	U	0.114	0.076	U	0.076
SP-9	J16969	2/12/08	0.073	U	0.073	0.033	U	0.033	0.033	U	0.033	0.032	U	0.032	0.084	U	0.084	0.103	U	0.103	0.075	U	0.075
SP-10	J16970	2/12/08	0.063	U	0.063	0.023	U	0.023	0.020	U	0.020	0.021	U	0.021	0.060	U	0.060	0.061	U	0.061	0.063	U	0.063
Dup. of SP-10	J16971	2/12/08	0.154	U	0.154	0.071	U	0.071	0.069	U	0.069	0.067	U	0.067	0.176	U	0.176	0.220	U	0.220	0.153	U	0.153

Note: The following abbreviations apply to all Attachment 1 tables. Data qualified with C and/or J are considered acceptable values.

B = blank contamination (organic constituents)

C = blank contamination (inorganic constituents)

D = diluted

GEA = gamma energy analysis

MDA = minimum detectable activity

PQL = practical quantitation limit

Q = qualifier

U = undetected

Attachment

Originator

Checked

Calc. No.

1

L. D. Habel

H. M. Sulloway

0100F-CA-V0364

Sheet No.

Date

Date

Rev. No.

1 of 21

05/21/08

5/21/08

0

Calculation Brief Distribution Sheet

Calculation Number: 0100F-CA-V0364

100-F-26:9 Staging Pile Cleanup Verification 95% UCL Calculation

TITLE	NAME	MSIN	COPIES
Originator	L. D. Habel	H4-23	1
Checker	H. M. Sulloway	H4-23	1
Reviewer	NA		
Approver	J. D. Fancher	X9-07	
CVP Files			
Document Control	M. L. Cockrum	H4-11	1
100 Area Project Files			
Calc. Brief Files	M. T. Hughes	H4-23	Original
Other			

CALCULATION COVER SHEETProject Title: 100-F Area Field RemediationJob No. **14655**Area: 100-FDiscipline: Environmental*Calculation No: 0100F-CA-V0365Subject: 100-F-26:9 Staging Pile Hazard Quotient and Carcinogenic Risk CalculationComputer Program: ExcelProgram No: Excel 2003

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	Total = 5	L. D. Habel	H. M. Sulloway		J. D. Fancher	4/27/08
1	Total = 5	L. D. Habel	H. M. Sulloway	NA	J. D. Fancher	6/15/08

SUMMARY OF REVISION

1	Added beta-BHC and revised value for chlordane (alpha, gamma).

Washington Closure Hanford

CALCULATION SHEET

Originator:	L.D. Habel	Date:	7/15/08	Calc. No.:	0100F-CA-V0365	Rev.:	1
Project:	100-F Field Remediation	Job No:	14655	Checked:	H. M. Sulloway	Date:	7/15/08
Subject:	100-F-26:9 Staging Pile Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 1 of 4	

PURPOSE:

Provide documentation to support the calculation of the hazard quotient (HQ) and carcinogenic (excess cancer) risk values for the 100-F-26:9 subsite staging pile footprint. In accordance with the remedial action goals (RAGs) in the remedial design report/remedial action work plan (RDR/RAWP) (DOE-RL 2005), 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 x 10⁻⁶ for individual carcinogens
- 4) A cumulative excess cancer risk of <1 x 10⁻⁵ for carcinogens.

GIVEN/REFERENCES:

- 1) DOE-RL, 2005, *Remedial Design Report/Remedial Action Work Plan for the 100 Areas*, DOE/RL-96-17, Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- 2) WAC 173-340, "Model Toxics Control Act – Cleanup," *Washington Administrative Code*, 1996.
- 3) WCH, 2008, *Remaining Sites Verification Package for 100-F-26:9 1607-F2 Sanitary Sewer Pipelines*, Attachment to Waste Site Reclassification Form 2008-029, May 2008, Washington Closure Hanford, Richland, Washington.

SOLUTION:

- 1) Calculate an HQ for each noncarcinogenic constituent detected above background and compare it to the individual HQ of <1.0 (DOE-RL 2005).
- 2) Sum the HQs and compare to the cumulative HQ criterion of <1.0.
- 3) Calculate an excess cancer risk value for each carcinogenic constituent detected above background and compare it to the individual excess cancer risk criterion of <1 x 10⁻⁶ (DOE-RL 2005).
- 4) Sum the excess cancer risk values and compare to the cumulative cancer risk criterion of <1 x 10⁻⁵.

Washington Closure Hanford			CALCULATION SHEET			
Originator:	L.D. Habel	Date:	7/15/08	Calc. No.:	0100F-CA-V0365	Rev.: 1
Project:	100-F Field Remediation	Job No:	14655	Checked:	H. M. Sulloway	Date: 7/15/08
Subject:	100-F-26:9 Staging Pile Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 2 of 4

METHODOLOGY:

HQ and carcinogenic risk calculations were calculated for the staging pile portion of the 100-F-26:9 waste site using the statistically determined value for each analyte (WCH 2008). Boron and molybdenum required the HQ and risk calculations because these nonradionuclide contaminants of potential concern (COPCs) were detected and a Washington State or Hanford Site background value is not available. Hexavalent chromium, aroclor-1254, aroclor-1260 and multiple organic COPCs (as listed in Table 1) required the HQ and risk calculations because they were detected and cannot be attributed to natural occurrence. 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:

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. As a result, the maximum lead concentration is reported but not included in the hazard quotient calculation. Total petroleum hydrocarbon (TPH) data are not included in the calculations since TPH includes a broad range of constituents rather than an individual contaminant.

An example of the HQ and risk calculations is presented below:

- 1) For example, the maximum result for molybdenum (0.75 mg/kg), divided by the noncarcinogenic RAG value of 400 mg/kg (calculated in accordance with the noncarcinogenic toxic effects WAC 173-340-740[3]), is 1.9×10^{-3} . Comparing this value, and all other individual values, to the requirement of <1.0 , this criterion is met.
- 2) After the HQ calculations are completed for the appropriate analytes, the cumulative HQ is 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 1.8×10^{-2} . Comparing this values to the requirement of <1.0 , this criterion is met.
- 3) To calculate the excess cancer risk, the statistical result is divided by the carcinogenic RAG value, then multiplied by 1×10^{-6} . For example, the statistical result for hexavalent chromium is 0.23 mg/kg; divided by 2.1 mg/kg, and multiplied as indicated, is 1.1×10^{-7} . Comparing this value, and all other individual values, to the requirement of $<1 \times 10^{-6}$, this criterion is met.
- 4) After these calculations are completed for the carcinogenic analytes, the cumulative excess cancer risk is obtained by summing the individual values. The sum of the excess cancer risk values is 1.4×10^{-6} . Comparing this value to the requirement of $<1 \times 10^{-5}$, this criterion is met.

RESULTS:

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

Washington Closure Hanford

CALCULATION SHEET

Originator:	L.D. Habel	Date:	7/15/08	Calc. No.:	0100F-CA-V0365	Rev.:	1
Project:	100-F Field Remediation	Job No:	14655	Checked:	H. M. Sulloway	Date:	7/15/08
Subject:	100-F-26:9 Staging Pile Hazard Quotient and Carcinogenic Risk Calculations					Sheet No. 3 of 4	

**Table 1. Hazard Quotient and Excess Cancer Risk Results for the
100-F-26:9 Staging Pile Footprint**

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					
Boron	1.8	16,000	1.1E-04	--	--
Chromium, hexavalent ^c	0.23	240	9.6E-04	2.1	1.1E-07
Lead ^d	20.2	--	--	--	--
Molybdenum	0.75	400	1.9E-03	--	--
Semivolatiles					
Anthracene	0.026	24,000	1.1E-06	--	--
Benzo(a)anthracene	0.12	--	--	1.37 ^e	8.8E-08
Benzo(a)pyrene	0.14	--	--	0.33 ^f	4.2E-07
Benzo(b)fluoranthene	0.075	--	--	1.37 ^e	5.5E-08
Benzo(k)fluoranthene	0.12	--	--	13.7 ^e	8.8E-09
Benzo(ghi)perylene ^g	0.087	2,400	3.6E-05	--	--
Bis(2-ethylhexyl) phthalate	0.245	1,600	1.5E-04	71.4	3.4E-09
Chrysene	0.16	--	--	137 ^e	1.2E-09
Di-n-butylphthalate	0.026	8,000	3.3E-06	--	--
Fluoranthene	0.20	3,200	6.3E-05	--	--
Indeno(1,2,3-cd) pyrene	0.083	--	--	1.37	6.1E-08
Phenanthrene ^g	0.15	24,000	6.3E-06	--	--
Pyrene	0.26	2,400	1.1E-04	--	--
Pesticides					
BHC, beta (Hexachlorocyclohexane)	0.0039	--	--	0.556	7.0E-09
Chlordane (alpha, gamma)	0.0053	40	1.3E-04	2.86	1.9E-09
DDE, 4,4'-	0.0029	--	--	2.94	9.9E-10
Endrin (and ketone, aldehyde)	0.0026	24	1.1E-04	--	--
Polychlorinated Biphenyls					
Aroclor-1254	0.023	1.6	1.4E-02	0.5	4.6E-08
Aroclor-1260	0.019	--	--	0.5	3.8E-08
Totals					
Cumulative Hazard Quotient:			1.8E-02		
Cumulative Excess Cancer Risk:				1.4E-06	

Notes:

RAG = remedial action goal

-- = not applicable

^a = From WCH 2008.^b = Value obtained from Washington Administrative Code (WAC) 173-340-740(3), Method B, 1996, unless otherwise noted.^c = Value for the carcinogen RAG calculated based on the inhalation exposure pathway (WAC) 173-340-750(3), 1996.^d = No oral reference dose (RfD) or cancer slope factor (CSF)

^e = Calculated with toxicity values updated through May 1, 2008, using the appropriate formulas from WAC 173-340-740 (Ecology 1996). Updated toxicity values are available from the EPA Integrated Risk Information System (IRIS) at <<http://www.epa.gov/iris>> or from the Risk Assessment Information System (RAIS) database of the Oak Ridge National Laboratory (ORNL) on the Internet at <<http://risk.lsd.ornl.gov>>.

^f = Individual carcinogenic risk calculated using the required detection limit. Contribution to cumulative carcinogenic risk calculated based on the remedial action goal instead of the required detection limit, per WAC 173-340-740(3), Method B, 1996.

^g = Toxicity data for this chemical are not available. RAG based on the following surrogate chemicals: Contaminant: phenanthrene, surrogate: anthracene; benzo(g,h,i)perylene, surrogate: pyrene.

Washington Closure Hanford

CALCULATION SHEET

Originator:	L.D. Habel <i>L.D.</i>	Date:	7/15/08	Calc. No.:	0100F-CA-V0365	Rev.:	1
Project:	100-F Field Remediation	Job No:	14655	Checked:	H. M. Sulloway <i>HMS</i>	Date:	7/15/08
Subject:	100-F-26:9 Staging Pile Hazard Quotient and Carcinogenic Risk Calculations						Sheet No. 4 of 4

1 **CONCLUSION:**

2

3 This calculation demonstrates that the 100-F-26:9 staging pile meets the requirements for the hazard
 4 quotients and carcinogenic (excess cancer) risk as identified in the RDR/RAWP (DOE-RL 2005).

Calculation Brief Distribution Sheet

Calculation Number: 0100F-CA-V0365

100-F-26:9 Staging Pile Hazard Quotient and Carcinogenic Risk Calculation

TITLE	NAME	MSIN	COPIES
Originator	L. D. Habel	H4-23	1
Checker	H. M. Sulloway	H4-23	1
Reviewer	NA		
Approver	J. D. Fancher	X9-07	1
CVP Files			
Document Control	M. L. Cockrum	H4-11	1
100 Area Project Files			
Calc. Brief Files	M. T. Hughes	H4-23	Original
Other			

APPENDIX D

POST-REMEDIATION RADIOLOGICAL SURVEYS

APPENDIX E

DATA QUALITY ASSESSMENT

CONFIRMATORY SAMPLING

A data quality assessment (DQA) was performed to compare the sampling approach and resulting analytical data with the sampling and data requirements specified in the site-specific sample design (BHI 2004). This DQA was performed in accordance with site specific data quality objectives found in the Sampling and Analysis Plan (SAP) (DOE-RL 2005b).

A review of the sample design (BHI 2004), the field logbooks (BHI 2005a, b), and applicable analytical data packages has been performed as part of this DQA. All samples were collected per the sample design.

To ensure quality data, the SAP data assurance requirements and the data validation procedures for chemical and radiochemical analyses (BHI 2000a, b) 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 2000).

The confirmatory sampling approach for the 100-F-26:9 waste site included a sample design with multiple subunit areas. Confirmatory sample data collected at the 100-F-26:9 waste site were provided by the laboratories in multiple sample delivery groups (SDGs). No major deficiencies were found in the analytical data set or supporting documentation. Minor deficiencies are discussed by SDG below.

SDG H2937

SDG H2937 consists of 10 field samples (J025J1 – J025J9, J025K0). This SDG was submitted for third-party validation. No major deficiencies were found in this data set. Minor deficiencies are as follows.

- In the hexavalent chromium analysis, the relative percent difference (RPD) reported on the laboratory duplicate is 47.6%. Both the initial result and the duplicate result are near the detection limit with the initial result being undetected. Evaluation of RPDs near the detection limit is problematic. Third-party validation did not assign any qualifiers for this result. The data are useable for decision-making purposes.
- In the hexavalent chromium analysis, the required quantitation limit (RQL) (0.5 mg/kg) was exceeded for all undetected samples. Most of these are inconsequential because the reported detection limits remain below the lowest applicable remedial action goal (RAG) (2.0 mg/Kg). Sample J025J1 required a 100 fold dilution and is reported as undetected at 33.9 mg/Kg. This sample was collected from service area 10, which has subsequently been remediated and sampled for verification purposes. Hexavalent chromium was retained as a contaminant of concern (COC) for verification sampling. Third-party validation did not assign any qualifiers for these results. The data are useable for decision-making purposes.
- In the polychlorinated biphenyls (PCB) analysis, sample J025J1 required a 10 fold dilution. The RQL was exceeded for all undetected analytes in sample J025J1. The sample area has been

subsequently remediated and sampled for verification purposes. PCBs were retained as COCs for verification sampling. Third-party validation did not assign any qualifiers for this result. The data are useable for decision-making purposes.

- In the inductively coupled plasma (ICP) metals analysis, the matrix spike (MS) recovery for antimony is below the acceptance criteria (70-130%) at 64.4%. Third-party validation qualified all of the antimony data in SDG K2937 as estimated with “J” flags. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS recovery for zinc was above the acceptance criteria (70-130%) at 133.9%. Third-party validation qualified all of the zinc data in SDG K2937 as estimated with “J” flags. Estimated data are useable for decision-making purposes.
- In the gamma spectroscopy analysis, the RPD reported for radium-228 and thorium-232 are both above the acceptance criteria (less than 30%) at 48%. Elevated RPDs in environmental samples are attributed to natural heterogeneity in the sample matrix. Third-party validation qualified all of the radium-228 and thorium-232 results in SDG H2937 as estimates with “J” flags. Estimated data are useable for decision-making purposes.
- In the semivolatile organic compounds (SVOC) analysis, the common laboratory contaminant bis(2-ethylhexyl)phthalate was detected in the method blank (MB). There is no impact on the field sample data because MB result is more than 20 times less than the field sample results for bis(2-ethylhexyl)phthalate. Third-party validation did not assign any qualifiers for this result. The data are useable for decision-making purposes.

SDG H2938

SDG H2937 consists of one field sample (J025P9). No major deficiencies were found in this data set. Minor deficiencies are as follows.

- In the PCB analysis, the results are reported as undetected with practical quantitation limits (PQLs) above the RQLs and above the RAG concentrations by a small margin. Analytical data is routinely reported below the PQL and qualified by the laboratories estimate. If PCB were present at the RAG concentrations they would have been detected and reported. The data are useable for decision-making purposes.
- In the hexavalent chromium analysis, the result for sample J025P9 is reported as undetected at 35.6 mg/Kg, which is above the soil RAG for this analyte. The nature of the sample matrix (vitrified clay pipe) has impacted the PQL for hexavalent chromium. This analysis was only run because of a laboratory error. Hexavalent chromium was not indicated in the work instruction for sample J025P9. This result has no impact on other field sample data. The data are useable for decision-making purposes.
- In the ICP metals analysis, the analyte chromium was detected in the MB. The chromium result for sample J025P9 is less than 20 times the MB result. The chromium result for sample J025P9 may be considered estimated. Estimated data are useable for decision-making purposes.

- In the ICP metals analysis, the MS result for eight analytes (aluminum, barium, calcium, iron, manganese, lead, silicon, zinc) are outside of the range of the acceptance criteria (70-130%). To confirm quantitation, the laboratory has run post-digestion spikes (PDSs) and serial dilutions for these analytes. The PDS results for all but the lead were in the range of 82.4% to 105.6% and are within the acceptance criteria. The PDS result for lead is 68.3%. The lead result for sample J025P9 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the RPDs calculated for eight analytes (arsenic, 34.1%; barium, 88.0%; cobalt, 30.7%; copper, 39.1%; iron, 31.3%; magnesium, 44.5%; manganese, 75.4%; lead, 188.3%) are above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for these analytes in sample J025P9 may be considered estimated. Estimated data are useable for decision-making purposes.

SDG H2945

SDG H2945 consists of one field sample (J025K6). No major deficiencies were found in this data set. Minor deficiencies are as follows.

- In the PCBs analysis, an interference prevented recovery of the MS and matrix spike duplicate (MSD) for aroclor-1260. The MB and laboratory control sample (LCS) are within the acceptance criteria for all analytes including aroclor-1260. The aroclor-1260 result for sample J025K6 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS result for 14 analytes (silver, aluminum, barium, cadmium, chromium, copper, iron, nickel, lead, antimony, silicon, zinc, calcium, mercury) are outside of the laboratory acceptance criteria (75-125%). To verify quantitation, the laboratory has run PDSs and serial dilutions on all but the calcium and mercury. The PDS results were acceptable falling in the range of 89.5% to 121.2%. For mercury a serial dilution was performed with acceptable results. For all but the antimony the initial MS addition was insignificant compared to the native concentrations in the sample from which the MS was prepared (J025K6). Based on the original MS result, antimony may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the RPD calculated for lead is above the acceptance criteria (less than 30%) at 73%. Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for lead in sample J025K6 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the total petroleum hydrocarbon (TPH) analysis, the MS recovery for TPH was below the acceptance criteria. The added spike concentration was small compared to the native concentration of TPH in sample J025K6. The TPH result in sample J025K6 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the gross alpha analysis, the RPD calculated for gross alpha is above the acceptance criteria (less than 30%) at 53%. Elevated RPDs in environmental samples are attributed to natural heterogeneities

in the sample matrix. The analytical results for gross alpha in sample J025K6 may be considered estimated. Estimated data are useable for decision-making purposes.

- In the gamma spectroscopy analysis, the RPDs reported for potassium-40 and radium-226 are above the acceptance criteria (less than 30%) at 42% and 37%, respectively. Elevated RPDs in environmental samples are attributed to natural heterogeneity in the sample matrix. The analytical results for potassium-40 and radium-226 may be considered estimated. Estimated data are useable for decision-making purposes.

SDG H2950

SDG H2950 consists of eight field samples (J025K1 – J025K5, J026D1, J026D2, J026D4). No major deficiencies were found in this data set. Minor deficiencies are as follows.

- In the ICP metals analysis for sample J026D4, the MS result for five analytes (aluminum, iron, manganese, antimony, silicon) are outside of the laboratory acceptance criteria (75-125%). To verify quantitation, the laboratory has run PDSs and serial dilutions on these analytes. The PDS results were acceptable falling in the range of 92.5% to 107.5%. For all but the antimony, the initial MS addition was insignificant compared to the native concentrations in the sample from which the MS was prepared. Based on the original MS result, antimony may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis for all of the samples in SDG H2950 except sample J026D4, the MS result for seven analytes (aluminum, calcium, iron, manganese, antimony, silicon, zinc) are outside of the range of the acceptance criteria (70-130%). To confirm quantitation the laboratory has run PDSs and serial dilutions. The PDS results were in the range of 78.5% to 113.3% and are within the acceptance criteria. The data are useable for decision-making purposes.
- In the ICP metals analysis for all of the samples in SDG H2950, except sample J026D4 which was run separately, the RPDs calculated for eight analytes (boron, 50%; cadmium, 71.1%; iron, 35.1%; manganese, 33.9%; sodium, 35.4%; lead, 45.2%; selenium, 43.4%; zinc, 45.5%) are above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for these analytes may be considered estimated. Estimated data are useable for decision-making purposes.
- In the SVOC analysis, the internal standard criteria were not met for samples J025K1, J026D2, and the MS and MSD samples, which were prepared from sample J026D2. Analysis of the MS and MSD fulfills the reanalysis requirement of sample J026D2. Sample J025K1 was reanalyzed with similar results. All of the surrogate recoveries were within criteria. The SVOC data in samples J025K1 and J026D2 may be considered estimated. Estimated data are useable for decision-making purposes.

SDG H2972

SDG H2972 consists of two soil samples (J02D75, J02D76). No major deficiencies were found in this SDG. Minor deficiencies are as follows.

- In the gross beta analysis, the RPD calculated for the laboratory duplicate was above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for gross beta may be considered estimated. Estimated data are useable for decision-making purposes.
- In the SVOC analysis, the common laboratory contaminant bis(2-ethylhexyl)phthalate was detected in the MB (.044 mg/kg) and in the field samples (.055mg/kg, .084 mg/kg) all at similar concentrations. The field sample results may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, potassium was detected in the MB and in all of the field samples at similar concentrations. Potassium is not a contaminants of potential concern (COPC) for this waste site. The field sample concentrations reported for potassium in samples J02D75 and J02D76 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the LCS result for silicon was below the acceptance criteria (70-130%) at 68%. Silicon is not a COPC for this waste site. The field sample concentrations reported for silicon in samples J02D75 and J02D76 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS result for six analytes (aluminum, calcium, iron, antimony, silicon, mercury) are outside of the range of the acceptance criteria (70-130%). To confirm quantitation the laboratory has run a serial dilution for mercury and PDSs and serial dilutions for the other analytes, all with good results. The PDS results were in the range of 78.9% to 97.5% and are within the acceptance criteria. The data are useable for decision-making purposes.
- In the ICP metals analysis, the RPD results for three analytes (molybdenum, 55.3%; antimony, 43.9%; silicon 55.6%) are above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for these three analytes in sample SDG H2972 may be considered estimated. Estimated data are useable for decision-making purposes.

SDG 2975

SDG H2975 consists of three samples (J025K8, J025K9, J025L0) of vitrified clay pipe. No major deficiencies were found in this SDG. Minor deficiencies are as follows.

- In the SVOC analysis, the common laboratory contaminant bis(2-ethylhexyl)phthalate was detected below the contract required quantitation limit (CRQL) in the MB (.044 mg/kg) and field samples (0.067mg/kg - 0.330 mg/kg). The field sample results may be considered estimated. Estimated data are useable for decision making-purposes.
- In the PCB analysis, sample J025K8 required a 10 fold dilution due to a high concentration of aroclor-1254. The other analytes were reported as non-detected with high MDLs due to the dilution.

The analytical results for PCBs, other than aroclor-1254, may be considered estimated. Estimated data are useable for decision-making purposes.

- In the ICP metals analysis, potassium was detected in the MB and in all of the field samples at similar concentrations. Potassium is not a COPC for this waste site. The field sample concentrations reported for potassium in samples J025K8, J025K9, and J025L0 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the LCS result for silicon was below the acceptance criteria (70-130%) at 68%. Silicon is not a COPC for this waste site. The field sample concentrations reported for silicon in samples J025K8, J025K9, and J025L0 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS result for seven analytes (aluminum, calcium, chromium, iron, lead, silicon, mercury) are outside of the range of the acceptance criteria (70-130%). To confirm quantitation, the laboratory has run serial dilutions for mercury, PDSs, and other analytes, all with good results. The PDS results were in the range of 77% to 97.5% and are within the acceptance criteria. The data are useable for decision-making purposes.
- In the ICP metals analysis, the RPD results for four analytes (silver, 73.8%; boron, 34.3%; potassium, 63.1%; magnesium, 39.3) are above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for these four analytes in sample SDG H2975 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the TPH, the RPD calculated for TPH is above the acceptance criteria (less than 30%) at 89.4%. Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for these three samples in SDG H2975 may be considered estimated. Estimated data are useable for decision-making purposes.

SDG W04485

SDG W04485 consists of sample J025L8, analyzed for hexavalent chromium. No major or minor deficiencies were found in SDG W04485. The data are useable for decision-making purposes.

SDG W04503

SDG W04503 consists of two samples (J02DD6, J02DD7) of vitrified clay pipe. No major deficiencies were found in SDG W04503. Minor deficiencies are as follows.

- In the hexavalent chromium analysis, sample J02DD6 exceeded the hold time (24 hours) by less than three hours. There is no impact on the sample data. The data are useable for decision-making purposes.
- In the hexavalent chromium analysis, the MS and MSD results were below the acceptance criteria (70-130%) at 26.3% and 19.1%, respectively. A post digestion matrix spike was run with better

results (65%) but still below the acceptance criteria. The laboratory commented that these results appear to be a matrix effect. The results are not low enough to cause the data to be rejected. Hexavalent chromium results for samples J02DD6 and J02DD7 may be considered estimated. Estimated data are useable for decision-making purposes.

SDG W04495

SDG W04495 consists of one sample (J025M4) of vitrified clay pipe. No major deficiencies were found in SDG W04495. Minor deficiencies are as follows.

- In the hexavalent chromium analysis, the MS and MSD recoveries are below the acceptance criteria (70-130%) as 59% and 49%, respectively. A post digestion matrix spike (75%) indicated a possible matrix effect. The LCS recovery (101%) was within criteria. The hexavalent chromium result for sample J025M4 may be considered estimated. Estimated data are useable for decision-making purposes.

Confirmatory Data Quality Assessment Summary

Limited, random, or sample matrix-specific influenced batch quality control (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-F-26:9 confirmatory 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-F-26:9 waste site concludes that the reviewed data are of the right type, quality, and quantity to support the intended use. Detection limits, precision, accuracy, and sampling data group completeness were assessed to determine if any analytical results should be qualified as a result of quality assurance (QA) and QC deficiencies. The analytical data were found acceptable for decision-making purposes. The confirmatory sample analytical data are stored in the Environmental Restoration (ENRE) project-specific database prior to being submitted for inclusion in the Hanford Environmental Information System (HEIS) database. The confirmatory sample analytical data are also summarized in Appendix B.

VERIFICATION SAMPLING

A 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 designs (DOE-RL 2005, WCH 2008). This DQA was performed in accordance with site-specific data quality objectives found in the SAP (DOE-RL 2005).

A review of the sample design (WCH 2008), field logbooks (WCH 2007a, 2007b), and applicable analytical data packages has been performed as part of this DQA. All samples were collected per the sample design. To ensure quality data, the SAP data assurance requirements and the data validation procedures for chemical 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., decision-making purposes). The DQA completes the data life cycle

(i.e., planning, implementation, and assessment) that was initiated by the data quality objectives process (EPA 2000).

Verification sample data collected at the 100-F-26:9 waste site were provided by the laboratories in nine SDGs: SDG K0705, SDG K0709, SDG K0710, SDG K0712, SDG K1108, SDG K1118, SDG K1120, SDG K1121, and SDG K1123. SDG 1121 was submitted for third-party validation. No major deficiencies were found in the SDGs. Minor deficiencies are discussed by SDG as follows below. Unless otherwise noted, deficiencies listed below are specific to the individual SDG, but apply to all samples within that SDG.

SDG K0705

This SDG comprises four field samples (J14JT0 – J14JT3) collected from the 100-F-26:9 pipeline road cross excavation. These samples were analyzed for ICP metals, mercury, SVOCs, PCBs, TPH, hexavalent chromium, gross alpha, gross beta, and by gamma spectroscopy. The ICP metals, mercury, SVOCs, PCBs, TPH, and hexavalent chromium analyses were performed in two batches, one for samples J14JT0 – J14JT2 and one for sample J14JT3. No major deficiencies were found in SDG K0705. Minor deficiencies are as follows.

- In the SVOC analysis for both analytical batches in SDG K0705, the common laboratory contaminant bis(2-ethylhexyl)phthalate was detected in the method blank (MB). The sample bis(2-ethylhexyl) phthalate results may be considered estimated. Estimated data are useable for decision-making purposes.
- Surrogate recoveries in the SVOC analysis are outside the initial criterion, with high results, for samples J14JT1 and J14JT2. However, the samples meet the secondary criterion for surrogate recoveries, as there is no more than one outlier for each sample. The data are acceptable for decision-making purposes.
- In the SVOC analysis for samples J14JT0-J14JT2, the bis(2-chloroethoxy)methane MS and MSD recoveries are both 49%, below the acceptance criteria. The 1,2,4-trichlorobenzene MS and MSD recoveries are below the acceptance criteria at 53% and 56%, respectively. The MS recoveries for 1,3-dichlorobenzene and hexachloroethane are both 49%. The 2,2'-oxybis(1-chloropropane) MS and MSD recoveries are both 44%, and the 2,4-dimethylphenol MS and MSD recoveries are 48% and 45%, respectively. The sample results for these analytes may be considered estimated. Estimated data are useable for decision-making purposes.
- In the SVOC analysis for samples J14JT3, the 1,2,4-trichlorobenzene MS and MSD recoveries are below the acceptance criteria at 50% and 54%, respectively. The MS recoveries for 4-chloro-3-methylphenol and 2-methylnaphthalene are 58% and 59%, respectively. The sample J14JT3 results for these analytes may be considered estimated. Estimated data are useable for decision-making purposes.
- The sample spike was not added to the LCS sample for many of the SVOC analyses for samples J14JT0-J14JT2. Due to lack of a LCS analysis for 69 of the 192 SVOC analyses, all results for analytes with low LCS recoveries are considered estimated for samples J14JT0-J14JT2. Estimated

data are useable for decision-making purposes.

- In the PCB analyses for samples J14JT0-J14JT2, the surrogate recovery for the samples were all within the QC limits, however, the MS/MSD and LCS samples were given a second surrogate solution spike instead of a sample spiking solution. Therefore, due to lack of a MS, MSD, or LCS analysis for the PCBs, all PCB data for samples J14JT0-J14JT2 are considered estimated. Estimated data are acceptable for decision-making purposes.
- In the ICP metals analysis for samples J14JT0-J14JT2, the MS recoveries for three ICP metals (aluminum, iron, and antimony) are out of project acceptance criteria. 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 analytical variability of the native concentration rather than a measure of the recovery from the sample. To confirm quantitation, post digestion spikes and serial dilutions were prepared for each analyte with results ranging between 98.8-105.5%. Antimony did not have mismatched spike and native concentrations in the original MS. The original MS recovery for antimony was 54.0%. The antimony data for samples J14JT0-J14JT2 are considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis for sample J14JT3, the MS recoveries for five ICP metals (aluminum, iron, manganese, antimony, and silicon) are out of project acceptance criteria. For most of these analytes, 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 analytical variability of the native concentration rather than a measure of the recovery from the sample. To confirm quantitation, post digestion spikes and serial dilutions were prepared for each analyte with results ranging between 98.2-103.0%. Antimony did not have mismatched spike and native concentrations in the original MS. The original MS recovery for antimony was 49.1%. The antimony data for sample J14JT3 is considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the LCS recovery for silicon is below the acceptance criteria at 10% for samples J14JT0-J14JT2, and 15.5% for sample J14JT3. The silicon data for SDG K0705 is considered estimated. Estimated data are useable for decision-making purposes.

SDG K0709

This SDG comprises one field samples (J14JT4) collected from the 100-F-26:9 pipeline road crossing excavation. This sample was analyzed for ICP metals, mercury, SVOCs, PCBs, TPH, hexavalent chromium, gross alpha, gross beta, and by gamma spectroscopy. No major deficiencies were found in SDG K0709. Minor deficiencies are as follows.

- In the ICP metals analysis, the MS recoveries for four analytes (aluminum, iron, manganese, and silicon) are out of acceptance criteria. For these analytes, 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 analytical variability of the native concentration rather than a measure of the recovery from the sample. To confirm quantitation, PDSs and serial dilutions

were prepared for all four analytes with acceptable results. The data are useable for decision-making purposes.

- The RPD calculated for arsenic (32.3%) in the laboratory duplicate pair are above the acceptance criteria of 30%. Elevated RPDs in environmental soil samples are generally attributed to heterogeneities in the sample matrix and not to deficiencies in the laboratory procedures. The data are useable for decision-making purposes.
- In the SVOC analysis, the common laboratory contaminants bis(2-ethylhexyl)phthalate are detected in the MB. The sample bis(2-ethylhexyl)phthalate results may be considered estimated. The data are useable for decision-making purposes.
- A surrogate recovery in the SVOC analysis is outside the initial criterion, with a low result. However, the sample meets the secondary criterion for surrogate recoveries, as there is no more than one outlier for the sample. The data are acceptable for decision-making purposes.
- In the SVOC analysis, the bis(2-chloroethoxy)methane MS and MSD recoveries are both 49%. The MS recovery for 2-nitroaniline is 58%. The 2,2'-oxybis(1-chloropropane) MS and MSD recoveries are 44% and 43%, respectively. These MS and MSD recoveries are below acceptance criteria. The sample results for these analytes may be considered estimated. Estimated data are useable for decision-making purposes.
- The sample spike was not added to the LCS sample for the SVOC analyses for SDG K0709. Due to lack of a LCS analysis, all SVOC results are considered estimated. Estimated data are useable for decision-making purposes.

SDG K0710

This SDG comprises one field sample (J14JT7) collected from the 100-F-26:9 pipeline spill. This sample was analyzed for ICP metals, mercury, hexavalent chromium, and TPH. No major deficiencies were found in SDG K0710. Minor deficiencies are as follows.

- In the hexavalent chromium analysis, MS recovery is out of project acceptance criteria. 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 analytical variability of the native concentration rather than a measure of the recovery from the sample. The hexavalent chromium data are useable for decision-making purposes.
- In the ICP metals analysis, the MS recoveries for six ICP metals (aluminum, chromium, iron, manganese, antimony, and silicon) are out of project acceptance criteria. For most of these analytes, 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 analytical variability of the native concentration rather than a measure of the recovery from the sample. To confirm quantitation, PDSs and serial dilutions were prepared for all three analytes with acceptable results. Antimony did not have mismatched spike and native concentrations in the original MS. The original

MS recovery for antimony was 47.7%. The antimony data for SDG K0710 may be considered estimated. Estimated data are useable for decision-making purposes.

- In the ICP metals analysis, the LCS recovery for silicon is below the acceptance criteria at 15.5%. The silicon data for SDG K0710 may be considered estimated. Estimated data are useable for decision-making purposes.

SDGK0712

SDG K0712 comprises two field samples (J13W57, J14JT5). Both samples are soil. These samples were analyzed for ICP metals, mercury, PCBs, hexavalent chromium, SVOCs, total petroleum hydrocarbon, gross alpha and gross beta by proportional counting, and by gamma spectroscopy. No major deficiencies were found in SDG K0712. Minor deficiencies are as follows.

- In the gross alpha analysis, the RPD reported for the laboratory duplicate is above the acceptance criteria (less than 30%) at 87%. Elevated RPDs calculated for environmental soils are generally attributed to natural heterogeneities in the sample matrix. The gross alpha results for samples J13W57 and J14JT5 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the gamma spectroscopy analysis, the RPDs calculated for three analytes (radium-226, 67%; radium-228, 88%; thorium-232, 88%) are above the acceptance criteria (less than 30%). Elevated RPDs calculated for environmental soils are generally attributed to natural heterogeneities in the sample matrix. The radium-226, radium-228, and thorium-232 results for samples J13W57 and J14JT5 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the SVOC analysis, the recoveries for seven, out of a total of 54, surrogates are outside the range of the acceptance criteria. The sample (J13W57) was re-extracted and analyzed. Surrogates in the resulting analysis are all within the acceptance criteria. The laboratory concluded that the original run suffered from losses during the extraction. The second run will be retained for evaluation purposes. The data are useable for decision-making purposes.
- In the SVOC analysis, the MB contained the common laboratory contaminant bis(2-ethylhexyl)phthalate at a concentration below the CRQL. There is no significant impact on the field sample data. The data are useable for decision-making purposes.
- In the ICP metals analysis, the LCS recovery for silicon is below the acceptance criteria (70-130%) at 14.1%. Silicon is not a COPC for the 100-F-26:9 waste site. The silicon data for samples J13W57 and J14JT5 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS recoveries for four analytes (aluminum, iron, antimony, silicon) are outside of the acceptance criteria. To confirm quantitation the laboratory has run serial dilutions and PDSs, all with good results. The PDS results were in the range of 96.5% to 98.3% and are within the acceptance criteria. The data are useable for decision-making purposes.

- In the ICP metals analysis, the RPD result, associated with sample J14JT5, for 1 analyte (silicon, 37.8%) is above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for silicon in sample J14JT5 may be considered estimated. Estimated data are useable for decision-making purposes.

SDG K1108

SDG K1108 comprises four field samples (J16947 – J16950). All are soil samples. These samples were analyzed for ICP metals, mercury, PCBs, hexavalent chromium, total petroleum hydrocarbon, SVOCs, gross alpha and gross beta by proportional counting, and by gamma spectroscopy. No major deficiencies were found in SDG K1008. Minor deficiencies are as follows.

- In the gross alpha analysis, the RPD calculated for gross alpha in the laboratory duplicate is above the acceptance criteria (less than 30%) at 47%. Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for gross alpha in samples J16947 through J16950 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the SVOC analysis, the recoveries for five, out of a total of 48, surrogates are outside the range of the acceptance criteria. However, the surrogate recovery criteria were met (i.e., no more than one outlier per fraction [acid and base neutral] and no recoveries less than 10%). The data are useable for decision-making purposes.
- In the SVOC analysis, the MS recoveries for two analytes (di-n-octyl phthalate 163%, benzo(b) fluoranthene 132%) are above the acceptance criteria (70-130%). The analytical results for di-n-octyl phthalate and benzo(b) fluoranthene in samples J16947 through J16950 may be biased high. High biased data are useable for decision-making purposes.
- In the SVOC analysis, the LCS recoveries for two analytes (2,4-dinitrophenol, 19%; 4,6-dinitro-2-methylphenol, 25%) are below the acceptance criteria (70-130%). Analytical recoveries above 10% alone do not require rejection of the associated data. Quantitation of the field samples is confirmed by the recoveries of these analytes in the MS and MSD, which are within the acceptance criteria. The data are useable for decision-making purposes.
- In the ICP metals analysis, the initial calibration blank (0.019 mg/kg) and one of the continuing calibration blanks (0.014 mg/kg) are above the limit of quantitation. However, the results are small enough that there is no significant impact on the field sample data. The data are useable for decision-making purposes.
- In the ICP metals analysis, the MB result for sodium is above the limit of quantitation, and all of the field sample results are less than 20 times the MB concentration. Sodium is not a COPC for the 100-F-26:9 waste site. The sodium results for samples J16947 through J16950 may be considered estimated. Estimated data are useable for decision-making purposes.

- In the ICP metals analysis, the MS result for five analytes (aluminum, iron, manganese, antimony, silicon) are outside the acceptance criteria (70-130%). To confirm quantitation, the laboratory has run PDSs and serial dilutions for these analytes. The PDS results were in the range of 91.4% to 103.6% and are within the acceptance criteria. The data are useable for decision making-purposes.
- In the ICP metals analysis, the RPD result for one analyte (boron, 44.4%) is above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for boron in samples J16947 through J16950 may be considered estimated. Estimated data are useable for decision-making purposes.

SDG K1118

SDG K1118 comprises 10 field samples (J16951 – J16960). All are soil samples. These samples were analyzed for ICP metals, mercury, PCBs, hexavalent chromium, total petroleum hydrocarbon, SVOCs, gross alpha, and gross beta by proportional counting, and by gamma spectroscopy. No major deficiencies were found in SDG K1118. Minor deficiencies are as follows.

- In the gross beta analysis, the initial result for gross beta in sample J16951 was high enough to trigger reanalysis and analysis for strontium. The RPD calculated for gross beta in the second laboratory duplicate is above the acceptance criteria (less than 30%) at 34%. Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for gross beta in sample J16951 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the SVOC analysis, sample J16951 and the MS/MSD pair prepared from sample J16951 were not concentrated to the usual final concentration due to the nature of the extract. This has the same effect as a dilution. The PQLs in these samples have been elevated to reflect an eight fold dilution. As is demonstrated by the detection of bis(2-ethylhexyl)phthalate, the analytes are still detectable well below the calculated PQLs. The source of this deficiency appears to be the nature of the matrix in sample J16951. All data for sample J16951 may be considered estimated. The other field sample data does not appear to be impacted. The data are useable for decision-making purposes.
- In the SVOC analysis, the recoveries for four, out of a total of 84, surrogates are outside the range of the acceptance criteria. However, the surrogate recovery criteria were met (i.e., no more than one outlier per fraction [acid and base neutral] and no recoveries less than 10%). The data are useable for decision-making purposes.
- In the SVOC analysis, the MS recoveries for 25 analytes, out of a total of 128, are outside the acceptance criteria. The MS/MSD pair was prepared from sample J16951. As was mentioned above, the nature of the matrix in sample J16951 has impacted this analysis. This effect is limited to sample J16951 and the MS/MSD pair. All data for sample J16951 may be considered estimated. There is no impact on the other field sample data. The data are useable for decision-making purposes.
- In the SVOC analysis, the LCS recoveries for four analytes (2,4-dimethyphenol, 46%; 1,2,4-trichlorobenzene 55%; 4-chloro-3-methylphenol, 59%; 2-methylnaphthalene, 57%), out of a total of

64, are below the acceptance criteria (70-130%). The analytical results for 2,4-dimethyphenol, 1,2,4-trichlorobenzene, 4-chloro-3-methylphenol, and 2-methylnaphthalene, in samples J16951 through J16960, may be considered estimated. Estimated data are useable for decision-making purposes.

- In the ICP metals analysis, the MB result for sodium is above the limit of quantitation. The sodium concentrations in samples J16953, J16954, J1697, and J16959 are less than 20 times the MB concentrations. Sodium concentrations reported in these samples may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS result for four analytes (aluminum, copper, iron, silicon) are outside the acceptance criteria (70-130%). To confirm quantitation, the laboratory has run PDSs and serial dilutions for these analytes. The PDS results were in the range of 88.5% to 102.8% and are within the acceptance criteria. The data are useable for decision-making purposes.

SDG K1120

SDG K1120 comprises 11 field samples (J16961 – J16971). All are soil samples. These samples were analyzed for ICP metals, mercury, PCBs, hexavalent chromium, total petroleum hydrocarbon, SVOCs, chlorinated pesticides, gross alpha, gross beta, and by gamma spectroscopy. No major deficiencies were found in SDG K1120. Minor deficiencies are as follows.

- In the gross alpha analysis, the RPD reported is above the acceptance criteria (less than 30%) at 38%. Elevated RPDs in environmental samples are attributed to natural heterogeneity in the sample matrix. Sample data for gross alpha in SDG K1120 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the gross beta analysis, several of the original gross beta results were elevated, and inconsistent with the gamma spectroscopy results. These irregularities were traced back to the sample preparation and analysis methodology. In instances without a clear explanation of the data, the laboratory is asked to rerun samples. All of the samples in SDG K1120 were reanalyzed for gross beta. Evaluation of the second set of gross beta results found them to be consistent with the gamma spectroscopy, and is therefore believed to be more representative of the samples. The laboratory reissued SDG K1220 with the updated results. The reissued (final) data set appears in the various calculations and tables produced for the 100-F-26:9 waste site. The data are useable for decision-making purposes.
- In the gamma spectroscopy analysis, the RPDs reported for radium-228 (44%) and thorium-232 (44%) are above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneity in the sample matrix. Sample data for radium-228 and thorium-232, in SDG K1120, may be considered estimated. Estimated data are useable for decision-making purposes.
- In the SVOC analysis, sample J16970 was extracted and analyzed twice. The first analysis found all of the surrogate recoveries to be unacceptable, in the range of 4% to 7%. In the second analysis all of the surrogates are acceptable. However, the second extraction and analysis were performed

outside of the hold time. An evaluation of the results from both analyses found almost identical results for the target analytes, they are all non-detect. Although the data are exactly the same, the second run will be used for data evaluation. The second analysis was run within two times the hold time and from a data quality perspective is the better data. All data reported for sample J16970 may be considered estimated. Estimated data are useable for decision-making purposes.

- In the SVOC analysis, the MS/MSD recoveries for 21 analytes were outside of the acceptance criteria. All 21 of these deficiencies were reported in the MS. The MSD results were all within the acceptance criteria. Surrogates from the MS were also a low, but within criteria. This deficiency appears to be limited to the MS. The field sample data are not impacted. The data are useable for decision-making purposes.
- In the SVOC analysis, the LCS recoveries for 8 analytes (nitrobenzene, 47%; isophorone, 54%; 2,4-dimethylphenol, 49%; 1,2,4-trichlorobenzene, 53%; 2-methylnaphthalene, 57%; 2,4-dinitrophenol, 18%; 4,6-dinitro-2-methylphenol, 26%; bis(2-ethylhexyl)phthalate, 179%), are outside the acceptance criteria (70-130%). The analytical results for these results in samples J16961 through J16971 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the chlorinated pesticide analysis, the analyte toxaphene was not included in the MS, MSD, or LCS samples. Toxaphene is actually a mixture of compounds rather than a discrete analyte. While the overall concentration of toxaphene can be calculated using several unobstructed peaks in the chromatography, the inclusion of toxaphene in the spiking mixture would be problematic for the other pesticide analytes. The laboratory typically quantitates toxaphene but does not include toxaphene in QA/QC samples. The toxaphene data is therefore considered estimated. Estimated data are useable for decision-making purposes.
- In the PCB analysis, one of the surrogates (tetrachloro-m-xylene) in sample J16966 recovered high at 176%. However, this result meets the surrogate acceptance criteria which allow one outlier per sample. The high surrogate recovery may indicate a high bias in the analytical results for sample J16966. High biased data are useable for decision-making purposes.
- In the ICP metals analysis, the initial MS extract was lost (laboratory error) during extraction. The MS was replaced in a separate batch. The LCS confirms quantitation for the initial batch and the replacement MS confirms quantitation for the sample matrix. However, because the reported MS was prepared in a separate batch from the field samples, all of the ICP metals data reported in SDG K1120 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the LCS recovery for silicon is below the acceptance criteria (70-130%) at 7.6%. Poor recovery is common for silicon. Silicon is not a COPC for the 100-F-26:9 waste site. All of the silicon data reported in SDG K1120 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS result for seven analytes (aluminum, calcium, iron, magnesium, manganese, antimony, silicon) are outside the acceptance criteria (70-130%). To confirm quantitation, the laboratory has run PDSs and serial dilutions for these analytes. The PDS results

were in the range of 91.5% to 111.9% and are within the acceptance criteria. The data are useable for decision-making purposes.

- In the ICP metals analysis, the RPD result for one analyte (arsenic, 47.6%) is above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for arsenic in samples J16961 through J16971 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the hexavalent chromium analysis, the RPD result for hexavalent chromium is above the acceptance criteria (less than 30%) at 75.3%. Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The data are useable for decision-making purposes.

SDG K1121

This SDG comprises five field samples (J169W9, J169X0, J169X1, J16945, and J16946). These samples were analyzed for ICP metals, mercury, hexavalent chromium, PCBs, TPH, SVOCs, gross alpha and gross beta by proportional counting, and by gamma spectroscopy. SDG K1121 was submitted for formal third-party validation. No major deficiencies were found. Minor deficiencies found in SDG K1005 are as follows.

- In the radiochemical analysis, the RPD calculated for thorium-232 (36%) in the laboratory duplicate pair are above the acceptance criteria of 30%. The results for this analyte were qualified as estimates and flagged “J” by third-party validation. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS recoveries for four ICP metals (aluminum, iron, antimony, and silicon) are out of project acceptance criteria. 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 analytical variability of the native concentration rather than a measure of the recovery from the sample. To confirm quantitation, post digestion spikes and serial dilutions were prepared for each analyte with results ranging between 95.5-104.5%. Antimony and silicon did not have mismatched spike and native concentrations in the original MS. The antimony and silicon data for SDG K1121 were qualified as estimates and flagged “J” by third-party validation. Estimated data are useable for decision making-purposes.
- In the ICP metals analysis, the LCS recovery for silicon is below the acceptance criteria at 17.2%. The silicon data for SDG K1121 were qualified as estimates and flagged “J” by third-party validation. Estimated data are useable for decision making-purposes.
- In the SVOC analysis, the MS and/or MSD are below QC limits for 18 analytes. The bis(2-chloroethyl)ether MS and MSD are 37% and 48%, respectively. The MS recoveries for 1,3-dichlorobenzene; isophorone; and 2-nitrophenol are all 44%. The MS recoveries for n-nitroso-di-n-propylamine; 1,4-dichlorobenzene; and 1,2-dichlorobenzene are 43%, 46%, and 48%, respectively. The MS recoveries for 2-methylphenol; 2,2'-oxybis(1-chloropropane); and 3,4-methylphenol are outside QC limits at 57%, 40%, and 58%, respectively. The MS recoveries for hexachloroethane; nitrobenzene; and 2,4-dimethylphenol are 41%, 37%, and 48%, respectively. The

MS recoveries for phenol; 1,2,4-trichlorobenzene; 4-chloro-3-methylphenol; 2-methylnaphthalene; and acenaphthylene are 47%, 46%, 56%, 53%, and 58%, respectively. The data for these analytes in SDG K1121 were qualified as estimates and flagged “J” by third-party validation. Estimated data are useable for decision-making purposes.

- In the SVOC analysis, LCS recoveries were outside QC limits for 20 analytes. The LCS recoveries for 2,4-dimethylphenol; naphthalene; and pentachlorophenol are all 46%. The LCS recoveries for n-nitroso-di-n-propylamine and isophorone are both 46%. The LCS recoveries for bis(2-chloroethyl)ether; 1,4-dichlorobenzene; and 2-methylphenol are 39%, 49%, and 54%, respectively.
- The LCS recoveries for 2,2'-oxybis(1-chloropropane); 3,4-methylphenol; and hexachloroethane are 37%, 59%, and 44%, respectively. The LCS recoveries for nitrobenzene; bis(2-chloroethoxy)methane; and 1,2,4-trichlorobenzene are 40%, 43%, and 52%, respectively. The LCS recoveries for 4-chloroaniline; 4-chloro-3-methylphenol; 2-methylnaphthalene; 2-nitroaniline; 2,4-dinitrophenol; and dinitro-2-methylnaphthalene are 31%, 57%, 54%, 59%, 21%, and 37%, respectively. The results for these analytes were qualified as estimates and flagged “J” by third-party validation. Estimated data are useable for decision-making purposes.
- The RPDs for the following SVOCs were outside QC limits: hexachloroethane, 33%; hexachlorocyclopentadiene, 38%; acenaphthylene, 30.6%; 3-nitroaniline, 30.9; 4-bromophenylphenylether, 31%; hexachlorobenzene, 31.8%; 3,3-dichlorobenzidine, 43%; and ideno(1,2,3-cd)pyrene, 30.2%. The results for these SVOCs were qualified as estimates and flagged “J” by third-party validation. Estimated data are useable for decision-making purposes.

SDG K1182

SDG K1182 comprises one field sample (J16M53), a soil sample. This sample was analyzed for ICP metals, mercury, PCBs, hexavalent chromium, total petroleum hydrocarbon, SVOCs, chlorinated pesticides, gross alpha, and gross beta, and by gamma spectroscopy. No major deficiencies were found in SDG K1182. Minor deficiencies are as follows.

- In the gamma spectroscopy analysis, the RPDs reported for radium-228 (32%) and thorium-232 (32%) are above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneity in the sample matrix. Sample data for radium-228 and thorium-232, in sample J16M53, may be considered estimated. Estimated data are useable for decision-making purposes.
- In the hexavalent chromium analysis, the MS is evaluated for both soluble and insoluble hexavalent chromium. The predominant form of hexavalent chromium in environmental samples is the soluble form. The MS recovery for soluble hexavalent chromium is above the acceptance criteria (70-130%) at 163%. This result may indicate a high bias in the field sample data for sample J16M53. However, hexavalent chromium was reported as not detected in the sample. Therefore, there is no impact on the sample data. The data are useable for decision-making purposes.
- In the ICP metals analysis, the LCS recovery for silicon is below the acceptance criteria (70-130%) at 19.9%. Poor recovery is common for silicon. Silicon is not a COPC for the 100-F-26:9 waste

site. All of the silicon data reported in SDG K1182 may be considered estimated. Estimated data are useable for decision-making purposes

- In the ICP metals analysis, the MS result for eight analytes (aluminum, barium, calcium, copper, iron, lead, antimony, silicon) are outside the acceptance criteria (70-130%). To confirm quantitation the laboratory has run PDSs and serial dilutions for these analytes. With the exception of barium, the PDS results were in the range of 88.5% to 100.3% and are within the acceptance criteria. The PDS for barium was 65.7%. Barium results for sample J16M53 may be considered estimated. The data are useable for decision-making purposes
- In the ICP metals analysis, the RPD result for six analytes (arsenic, 33.3%; barium, 39.1%; copper 145.3%; molybdenum, 30.8%; silicon, 35.7%; zinc, 41%) are above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for these analytes in sample J16M53 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the SVOC analysis, the MS sample has slightly low, but within criteria, recoveries on all six of the surrogates. The MS recoveries for all of the analytes are also low with eleven results below the acceptance criteria. The MSD, LCS, and sample J16M53 do not show the same low surrogate recovery and the MSD, and LCS analyte recoveries are all within or above the acceptance criteria. The deficiency in the MS appears to be limited to the MS and is likely the result of an overall loss of material during the volume reduction step of the extraction process. Quantitation of the sample is verified by the MSD and the LCS. There is no impact on sample J16M53. The data are useable for decision-making purposes.
- In the SVOC analysis, the LCS recovery for one analyte (4-nitrophenol, 166%) is above the acceptance criteria (70-130%). The LCS result could indicate a high bias in the 4-nitrophenol data. However, the MS and MSD recoveries are within the acceptance criteria and do not suggest high bias. High biased data are useable for decision-making purposes.
- In the SVOC analysis, the common laboratory contaminant bis(2-ethylhexyl)phthalate was detected in the MB below the CRQL. Bis(2-ethylhexyl)phthalate was also detected at a similar concentration in the sample. Both results are below the applicable RAGs. The bis(2-ethylhexyl)phthalate result for sample J16M53 may be considered estimated. The data are useable for decision-making purposes.

SDG K1123

SDG K1123 comprises 11 field soil samples (J16934 – J16944), and 1 equipment blank (J16933). The field samples were analyzed for ICP metals, mercury, PCBs, hexavalent chromium, total petroleum hydrocarbon, SVOCs, chlorinated pesticides, gross alpha, gross beta, and by gamma spectroscopy. The equipment blank was analyzed for ICP metals, mercury, and SVOCs. No major deficiencies were found in SDG K1123. Minor deficiencies are as follows.

- In the gamma spectroscopy analysis, the RPD reported for radium-228 (33%) is above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to

natural heterogeneity in the sample matrix. Sample data for radium-228, in SDG K1123, may be considered estimated. Estimated data are useable for decision-making purposes.

- In the SVOC analysis, five out of six surrogate recoveries in sample J16933, the equipment blank, were below the acceptance criteria. These results suggest a low bias in the data for sample J16933, which may be considered estimated. There is no impact on the field sample data. The data are useable for decision-making purposes.
- In the SVOC analysis, 31 out of 128 MS/MSD recoveries are below the acceptance criteria. Evaluation of these, and the analytes that are within criteria, shows that the overall trend for all of the analytes is toward low recoveries. All of the SVOC data in SDG K1123 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the hexavalent chromium analysis, the RPD reported for hexavalent chromium is above the acceptance criteria (less than 30%) at 37.7%. Elevated RPDs in environmental samples are attributed to natural heterogeneity in the sample matrix. Sample data for hexavalent chromium, in SDG K1123, may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MB result for sodium is above the limit of quantitation, and all of the field sample results, with the exception of sample J16942, are less than 20 times the MB concentration.
- Also, the LCS recovery for sodium is below the acceptance criteria (70-130%) at 29.3%. Sodium is not a COPC for the 100-F-26:9 waste site. The sodium results for SDG K1123 may be considered estimated. Estimated data are useable for decision-making purposes.
- In the ICP metals analysis, the MS result for five analytes (aluminum, calcium, iron, antimony, silicon) are outside the acceptance criteria (70-130%). To confirm quantitation, the laboratory has run PDSs and serial dilutions for these analytes. The PDS results were in the range of 97.6% to 106.7% and are within the acceptance criteria. The data are useable for decision-making purposes.
- In the ICP metals analysis, the RPD results for three analytes (aluminum, 40%; arsenic, 40%; mercury, 64.7%) are above the acceptance criteria (less than 30%). Elevated RPDs in environmental samples are attributed to natural heterogeneities in the sample matrix. The analytical results for these analytes in SDG K1123 may be considered estimated. Estimated data are useable for decision-making purposes.

FIELD QUALITY ASSURANCE/QUALITY CONTROL

RPD 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 QA/QC measures are used to assess potential sources of error and cross contamination of samples that could bias results. Two field duplicate samples, listed in the field logbooks (WCH 2007a, b), were collected. The main samples are J16943 and J16970; and the duplicate samples are J16944 and J16971.

Field duplicate samples 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 duplicate samples for each contaminant of concern. None of the RPDs calculated for field duplicates are above the acceptance criteria (30%). The data are useable for decision-making purposes.

A visual inspection of all of the data is also performed. No additional major or minor deficiencies are noted. The data are useable 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-F-26:9 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-F-26:9 waste site concludes that the reviewed data are of the right type, quality, and quantity to support the intended use. Detection limits, precision, accuracy, and sampling data group completeness were assessed to determine if any analytical results should be rejected as a result of QA and QC deficiencies. The analytical data were found acceptable for decision-making purposes. The verification sample analytical data are stored in the ENRE project-specific database prior to being submitted for inclusion in the HEIS database. The verification sample analytical data are also summarized in Appendix B.

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