WASTE SITE RECLASSIFICATION FORM		
Date Submitted: <u>2/12/07</u> Originator: <u>L. M. Dittmer</u> Phone: <u>372-9664</u>	Operable Unit(s): <u>100-BC-1</u> Waste Site Code: <u>100-B-14:1</u> Type of Reclassification Action: Closed Out ☐ Interim Closed Out ☒ No Action ☐ RCRA Postclosure ☐ Rejected ☐ Consolidated ☐	Control Number: <u>2004-005</u>
<p>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.</p>		
<p><u>Description of current waste site condition:</u></p> <p>The 100-B-14:1 subsite encompasses the former process sewer main associated with the 105-B Reactor Building, 108-B Chemical Pumphouse and Tritium Separation Facility, 184-B Boiler House, and the 100-B water treatment facilities, as well as the feeder lines associated with the 108-B facility, formerly discharging to the 116-B-7 Outfall Structure. The subsite was evaluated by confirmatory sampling and determined to require remediation. Remedial actions and verification sampling at the subsite have been performed in accordance with remedial action objectives and goals established by the <i>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</i> (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 sample data, (2) remediating portions of the site, as necessary, (3) demonstrating through verification sampling that cleanup goals have been met, and (4) proposing the site for reclassification as interim closed out.</p>		
<p><u>Basis for reclassification:</u></p> <p>The 100-B-14:1 subsite has been remediated to achieve the remedial action objectives specified in the Remaining Sites ROD. The results of verification sampling demonstrated 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 showed that residual contaminant concentrations are protective of groundwater and the Columbia River. The suitability of direct exposure to deep zone soils has not been demonstrated, and institutional controls are required to prevent uncontrolled drilling or excavation into the deep zone. The basis for reclassification is described in detail in the <i>Remaining Sites Verification Package for the 100-B-14:1 Process Sewer</i> (attached).</p>		
<p><u>Waste Site Controls:</u></p> <p>Engineered Controls: Yes ☐ No ☒ Institutional Controls: Yes ☒ No ☐ O&M requirements: Yes ☐ No ☒</p> <p>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.</p>		
D. C. Smith DOE Federal Project Director (printed)	Signature	<u>2/20/07</u> Date
NA Ecology Project Manager (printed)	Signature	Date
D. A. Faulk EPA Project Manager (printed)	Signature	<u>2/22/07</u> Date

**REMAINING SITES VERIFICATION PACKAGE FOR THE
100-B-14:1 PROCESS SEWER**

Attachment to Waste Site Reclassification Form 2004-005

February 2007

REMAINING SITES VERIFICATION PACKAGE FOR THE 100-B-14:1 PROCESS SEWER

EXECUTIVE SUMMARY

The 100-B-14 waste site encompasses pre-reactor underground process and sanitary pipelines and sewers. This waste site has been divided into subsites for decision-making purposes based on functional use and geographical location. This remaining sites verification package addresses the 100-B-14:1 subsite only, which encompasses the process sewer mainline formerly providing service to the 105-B, 108-B, 182-B, 183-B, 184-B and 185/190-B facilities and discharging to the 116-B-7 Outfall Structure. Feeder lines associated with the 108-B facility are also included within this subsite, but feeder lines for other facilities serviced are included in other waste sites or other subsites of the 100-B-14 waste site.

The 100-B-14:1 subsite was evaluated during October 2003 using confirmatory sampling efforts to determine whether remedial action would be required. Focused samples were collected from manholes, pipelines exposed by other remedial activities, and underlying soils. Multiple chemical and radiological contaminants were detected above action levels within the feeder pipelines, and remedial action was determined to be necessary for all of the pipelines.

Site remediation consisted of the removal of pipelines, as well as adjacent, potentially-contaminated soils for disposal at the Environmental Restoration Disposal Facility. Overburden material presumed to be below cleanup levels was stockpiled on site for use in backfill. Remedial actions were performed so as to not preclude any future uses (as bounded by the rural-residential scenario) and to allow unrestricted use of shallow zone soils (i.e., surface to 4.6 m [15 ft] deep).

Following site remediation, initial verification sampling of overburden material and soil within the remediation footprints was conducted from May to June 2006. Following detection of elevated carbon-14 in overburden soils, portions of the stockpiled material were removed and additional sampling was performed in September 2006. Elevated carbon-14 was again detected in one field duplicate sample, but not in the associated primary sample. Based on this occurrence and the results of modified leachability tests on overburden soil samples with elevated carbon-14, residual carbon-14 was determined to be particulate (and thus relatively non-leachable) in nature. Accordingly, soil from the sampling area where elevated carbon-14 was detected in the field duplicate sample was used to backfill deep zone portions of the 100-B-14:1 excavation. The remaining results indicated that the waste removal action achieved compliance with the remedial action objectives for the site. A summary of the cleanup evaluation for the soil results against the applicable criteria is presented in Table ES-1. The results of the verification sampling are used to make reclassification decisions for the 100-B-14 waste site in accordance with the TPA-MP-14 (DOE-RL 1998) procedure.

In accordance with this evaluation, the 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 *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* (Remaining Sites ROD) (EPA 1999). 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. Deep zone soils have not been evaluated against direct exposure requirements, and institutional controls are required to prevent uncontrolled drilling/excavation into the deep zone.

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 to ecological risk screening levels has been made for the site contaminants of concern. Ecological screening levels were not exceeded for hexavalent chromium, the sole nonradionuclide COC. A more complete quantitative evaluation will be performed for the Hanford Site as part of the baseline risk assessment for the river corridor portion of the Hanford Site, which will be used to support the final closeout decision for the 100-B-14 waste site.

Table ES-1. Summary of Remedial Action Goals for the 100-B-14:1 Subsite. (2 Pages)

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.	Cesium-137 was quantified below the 15 mrem/yr dose-equivalence lookup value in the shallow zone decision unit and below background in the overburden decision unit. Europium-155 was quantified below the 15 mrem/yr dose-equivalence lookup value in the overburden decision unit, and was not detected in other decision units by verification sampling. Carbon-14 was detected above the 15 mrem/yr dose-equivalence lookup value in two samples from the shallow zone decision unit, but was not detected by resampling following additional remediation in the sample areas. Carbon-14 was initially detected above the 15 mrem/yr dose-equivalence lookup values in multiple overburden samples. Following additional remediation and a new sampling design for all overburden material, carbon-14 was detected above the 15 mrem/yr dose-equivalence lookup value in one field duplicate sample only. This sample area and adjacent sample areas were used exclusively for backfill into the deep zone, which is not subject to direct exposure requirements. All other radionuclides were not detected by verification sampling.	Yes
Direct Exposure – Nonradionuclides	Attain individual COC/COPC RAGs.	The statistical concentrations of hexavalent chromium (the sole non-radionuclide COC) are below the direct exposure RAGs in the shallow zone and overburden decision units and satisfy the WAC-173-340 3-part test criteria.	Yes

Table ES-1. Summary of Remedial Action Goals for the 100-B-14:1 Subsite. (2 Pages)

Regulatory Requirement	Remedial Action Goals	Results	Remedial Action Objectives Attained?
Risk Requirements – Nonradionuclides	Attain a hazard quotient of <1 for all individual noncarcinogens.	The hazard quotients for hexavalent chromium, the sole non-radionuclide COC, are less than 1 for the shallow zone and overburden decision units.	Yes
	Attain a cumulative hazard quotient of <1 for noncarcinogens.	The cumulative hazard quotients are less than 1 for the shallow zone and overburden decision units.	
	Attain an excess cancer risk of <1 x 10 ⁻⁶ for individual carcinogens.	The excess cancer risk values for hexavalent chromium, the sole non-radionuclide COC, are less than 1 x 10 ⁻⁶ for the shallow zone and overburden decision units.	
	Attain a cumulative excess cancer risk of <1 x 10 ⁻⁵ for carcinogens.	The cumulative excess carcinogenic risk values are less than 1 for the shallow zone and overburden decision units.	
Groundwater/ River Protection – Radionuclides	Attain single-COPC groundwater and river protection RAGs.	No radionuclide COCs were quantified above groundwater/river protection lookup values.	Yes
	Attain national primary drinking water standards: ^a 4 mrem/yr (beta/gamma) dose rate to target receptor/organs.		
	Meet drinking water standards for alpha emitters: the most stringent of 15 pCi/L MCL or 1/25th of the derived concentration guides from DOE Order 5400.5. ^b	No alpha-emitting radionuclides were identified as site COCs.	NA
	Meet total uranium standard of 30 µg/L (21.2 pCi/L). ^c	Uranium was not identified as a site COC and was not detected in gamma energy analysis of verification samples.	NA
Groundwater/ River Protection – Nonradionuclides	Attain individual nonradionuclide groundwater and river cleanup requirements.	The statistical residual concentrations of hexavalent chromium, the sole non-radionuclide COC, are less than soil RAGs for the protection of groundwater and the Columbia River in all decision units and satisfy the WAC-173-340 3-part test criteria.	Yes

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

^b *Radiation Protection of the Public and the 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).

COC = contaminant of concern

COPC = contaminant of potential concern

MCL = maximum contaminant level

NA = not applicable

RAG = remedial action goal

WAC = *Washington Administrative Code*

REMAINING SITES VERIFICATION PACKAGE FOR THE 100-B-14:1 PROCESS SEWER

STATEMENT OF PROTECTIVENESS

This report demonstrates that the 100-B-14:1 waste site meets the objectives for interim closure as 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, Hanford Site, Benton County, Washington* (Remaining Sites ROD) (EPA 1999). 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. The acceptability of unrestricted exposure to deep zone portions of this site has not been demonstrated; therefore, institutional controls to prevent uncontrolled drilling/excavation are necessary.

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 to ecological risk screening levels has been made for the site contaminants of concern. Ecological screening levels were not exceeded for hexavalent chromium, the sole nonradionuclide COC. A more complete quantitative evaluation will be performed for the Hanford Site as part of the baseline risk assessment for the river corridor portion of the Hanford Site, which will be used to support the final closeout decision for the 100-B-14 waste site.

GENERAL SITE INFORMATION AND BACKGROUND

The 100-B-14 waste site, in its entirety, comprises the underground process pipelines and process and sanitary sewers associated with the 100-B Area pre-reactor cooling water treatment facilities. For confirmatory sampling efforts, the 100-B-14 site was administratively divided into seven subsites for decision-making purposes based on the use of the pipelines (e.g., sanitary versus process sewers), expected sources of contamination, potential differing remedial action determinations, and geographical location. Two additional subsites were subsequently created to encompass pipelines thought to have been excluded from the initial delineation, but which actually were included in the 100-B-14:2 subsite; these subsites were administratively cancelled to resolve the redundancy. The nine subsites, including those cancelled, are as follows:

- 100-B-14:1 Main process sewer collection pipeline
- 100-B-14:2 Sanitary sewer pipelines
- 100-B-14:3 West process sewer feeder lines (182-B and 183-B)
- 100-B-14:4 190-B/105-B cooling water tunnel pipelines
- 100-B-14:5 Sodium dichromate and sodium silicate pipelines
- 100-B-14:6 184-B Powerhouse pipelines

- 100-B-14:7 185-B/190-B sump and process sewer pipelines
- 100-B-14:8 190-B sanitary sewer pipelines (*cancelled*)
- 100-B-14:9 1607-B7 sanitary sewer pipelines (*cancelled*).

The 100-B-14:1 subsite comprises the reinforced concrete process sewer main that formerly serviced the 105-B Reactor Building; the 108-B Chemical Pumphouse and Tritium Separation Facility; and 100-B water treatment facilities then discharged to the 116-B-7 Outfall Structure (remediated and reclassified as interim closed-out) (BHI 2002). Vitrified clay feeder pipelines associated with the 108-B facility are also included in the subsite. Feeder lines associated with the former 182-B Reservoir and 183-B Filter Plant were included in the 100-B-14:3 subsite and reclassified as “no action” (BHI 2004c). Feeder lines associated with the former 184-B Boiler House were included in the 100-B-14:6 subsite and reclassified as “no action” (BHI 2004d). Feeder lines associated with the 105-B Reactor Building will be addressed with the 118-B-8, 105-B Reactor waste site. The pipelines included within the 100-B-14:1 subsite are shown in Figure 1.

CONFIRMATORY EVALUATION AND SAMPLING ACTIVITIES

The 100-B-14:1 subsite was evaluated during October 2003 using focused confirmatory sampling to make a decision whether remedial action would be required at the subsite. Based on the results of this confirmatory sampling, it was decided that remedial action was necessary at the subsite (Feist 2004). The following subsections provide additional discussion of the information used to develop the confirmatory sampling design. The results of confirmatory sampling are also summarized to provide support for development of the remedial action strategy and verification sample design.

Contaminants of Potential Concern for Confirmatory Sampling

The COPCs for confirmatory sampling at the 100-B-14:1 subsite were identified based on existing analytical data and process knowledge of the facilities serviced by the sewer system. The COPC list included metals, hexavalent chromium, semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and alpha-, beta-, and gamma-emitting radionuclides (BHI 2003b). Additional isotope-specific analysis was also performed for one confirmatory sample based on the results of initial radionuclide analyses.

Confirmatory Sample Design

Historical information, site construction drawings, process knowledge, and site visit observations were used to develop a confirmatory sampling design with focused sampling in consideration of access and the likely worst case for potential residual contamination. Two locations were identified for collection of samples of pipeline contents and underlying soils: 1) a breach in the mainline near the outfall at the northern end of the line (B1/B2) and 2) a junction box downstream of influent lines from the 105-B, 108-B, and 185/190-B facilities, but upstream of the influent line from the 182-B and 183-B facilities (B3/B4) (BHI 2003b). Excavation and

Figure 1. Location of the 100-B-14:1 Pipeline.

confirmatory sampling was performed from October 8 to 14, 2003, as described in the sampler's field logbook (BHI 2003a). The pipe content sample at location B3 was collected from material in the eastern (influent) pipeline, and underlying soil at location B4 was collected from beneath the northern (effluent) pipeline. Sampling locations are shown in Figure 2; a summary of the samples collected and laboratory analyses performed is provided in Table 1.

Table 1. Confirmatory Sample Summary for the 100-B-14:1 Subsite.

Sample Location	Sample Media	Sample Number	Coordinate Locations	Depth (Field estimate, bgs)	Sample Analyses
B1	Pipe sediment and scale	J00YY1	N 145303.2 E 565256.1	6.4 m (21 ft)	ICP metals, mercury, PCB, SVOA, GEA, gross alpha, and gross beta
		J00YY3			Hexavalent chromium
B2	Soil underlying pipeline	J00YY5	N 145303.2 E 565256.1	6.4 m (21 ft)	ICP metals, mercury, hexavalent chromium, PCB, SVOA, GEA, gross alpha, and gross beta
B3	Pipe sediment and scale	J00YY2	N 144606.4 E 565033.6	7 m (23 ft)	ICP metals, mercury, PCB, SVOA, GEA, gross alpha, gross beta, carbon-14, nickel-63, isotopic plutonium, total beta radiostrontium, and tritium
		J00YY4			Hexavalent chromium
B4	Soil underlying pipeline	J00YY6	N 144606.4 E 565033.6	7 m (23 ft)	ICP metals, mercury, hexavalent chromium, PCB, SVOA, GEA, gross alpha, and gross beta
Duplicate of J00YY6	Soil underlying pipeline	J00Y71	N 144606.4 E 565033.6	7 m (23 ft)	ICP metals, mercury, hexavalent chromium, PCB, SVOA, GEA, gross alpha, and gross beta
Equipment blank	Silica sand	J00YY8	NA	NA	ICP metals, mercury, hexavalent chromium, PCB, and SVOA

Sources: *Remaining Sites Field Sampling*, Logbook EL-1578-1 (BHI 2003a).

bgs = below ground surface

GEA = gamma energy analysis

ICP = inductively coupled plasma

NA = not applicable

PCB = polychlorinated biphenyl

SVOA = semivolatile organic analysis

Figure 2. Confirmatory Sampling Locations for the 100-B-14:1 Subsite.

Confirmatory Sampling Results

Confirmatory samples were analyzed using analytical methods approved by the U.S. Environmental Protection Agency (EPA) (DOE-RL 2005a), and the results were compared against the cleanup criteria specified in the RDR/RAWP (DOE-RL 2005b). The results are stored in the Environmental Restoration (ENRE) project-specific database prior to being provided to the Hanford Environmental Information System (HEIS) and are provided in Appendix A and summarized below.

Analytical results for carbon-14, cesium-137, cobalt-60, europium-152, europium-154, nickel-63, strontium-90, tritium, barium, cadmium, total chromium, hexavalent chromium, copper, lead, manganese, mercury, nickel, silver, zinc, aroclor-1260, bis(2-ethylhexyl)phthalate, and multiple polycyclic aromatic hydrocarbons in pipe sediment/scale samples exceeded lookup values or RAGs for direct exposure and/or for protection of groundwater and/or the Columbia River. After correction to account for the pipe matrix, reported concentrations of carbon-14, cesium-137, and cobalt-60 still exceeded single-radionuclide dose-equivalence lookup values, and reported concentrations of lead, mercury, aroclor-1260, and bis(2-ethylhexyl)phthalate still exceeded soil RAG values for protection of groundwater and/or the Columbia River (Feist 2004). Evaluation of groundwater/river water protectiveness using the *100 Area Analogous Sites RESRAD Calculations* (BHI 2005) and contaminant soil-partitioning coefficient (K_d) values indicated that none of the nonradionuclide constituents would reach groundwater (and thus the Columbia River) within a 1,000-year timeframe (Feist 2004).

Analytical results for cesium-137, cobalt-60, europium-152, and europium-154 in the samples of soil underlying the pipeline exceeded single-radionuclide dose-equivalence lookup values. Analytical results for hexavalent chromium in underlying soil exceeded the direct exposure RAG, and results for barium, cadmium, total chromium, hexavalent chromium, copper, mercury, nickel, and zinc exceeded soil RAG values for the protection of groundwater and/or the Columbia River. Evaluation of groundwater/river water protectiveness using the *100 Area Analogous Sites RESRAD Calculations* (BHI 2005) and contaminant K_d values indicated that none of these nonradionuclide constituents would reach groundwater (and thus the Columbia River) within a 1,000-year timeframe, with the exception of hexavalent chromium (Feist 2004).

Based on the exceedance of dose-equivalence lookup values and RAGs, it was determined that remedial action was necessary at the 100-B-14:1 subsite (Feist 2004).

REMEDIAL ACTION SUMMARY

Remediation of the 100-B-14:1 pipeline was performed from January 2005 through April 2006 as part of the 100-B/C Area Remaining Pipes and Sewers remediation. In general, remediation of the pipelines consisted of the excavation and stockpiling (on-site) of overburden soils presumed to contain no residual contamination above cleanup levels; removal of soils around and approximately 0.3 m (1 ft) below the pipelines; and disposal of the pipeline and suspect potentially contaminated soil at the Environmental Restoration Disposal Facility (ERDF).

Excavation at the upgradient (southeastern) end of the pipeline near the former 108-B facility was restricted within the shallow zone (less than 4.6 m [15 ft] below ground surface [bgs]), and extended into the deep zone further downgradient, near the influent of the feeder line associated with the 105-B Reactor Building. The maximum depth of excavation was approximately 7.6 m (25 ft) bgs, near the outfall of the pipeline at the northern end of the site. Due to co-location and concurrent remediation of differing functional pipeline groups, excavated and disposed material quantities could not be explicitly separated for the 100-B-14:1 subsite. Following a determination that cleanup criteria had been attained, the excavation was backfilled with stockpiled overburden and borrow material. Railroad rails discovered and stockpiled during excavation of the site were also backfilled in the western portion of the excavation. A pre-excavation topographic survey of the site is shown in Figure 3; post-excavation civil surveys are shown in Figures 4 through 7.

In-process samples of soil and waste materials were collected during site remediation as needed to support waste characterization and evaluation of the waste profile for disposal of excavated material and to guide remediation efforts. The analytical results for these samples are provided in Appendix A. Photographs taken during remedial activities are provided in Appendix B.

CLEANUP VERIFICATION ACTIVITIES

Based on process knowledge and the results of the confirmatory sampling activity for the 100-B-14:1 subsite, this pipeline received radioactive waste stream discharges. Accordingly, the radioactive liquid waste effluent sites cleanup and closeout approach was implemented for the site, as described in the SAP (DOE-RL 2005a) and the following subsections.

Contaminants of Concern

The results of confirmatory sampling were used to determine the COCs for verification sampling. Those radionuclide contaminants that exceeded lookup values in samples of pipe contents (after correction to account for the inert pipe matrix) or in underlying soil were identified as site COCs, including carbon-14, cesium-137, cobalt-60, europium-152, and europium-154. Hexavalent chromium was also identified as a COC due to detections above RAG values in confirmatory samples collected from pipe contents and underlying soils. Other nonradionuclide constituents were either not quantified above RAG values (after correction to account for pipe matrix) or were quantified above soil RAG values for protection of groundwater and/or the Columbia River only, and subsequently predicted to not reach groundwater (and thus the Columbia River) within 1,000 years (BHI 2004b). Europium-155 was also identified as a COC due to detections within some variance and verification samples. Tritium was also included as a COC for the deep zone only because the 100-B-14:1 process sewer formerly serviced the 108-B Tritium Separation Facility and this radionuclide was detected in a confirmatory sample collected from the pipeline, but was mistakenly not included in analyses performed for underlying soils.

Figure 3. Pre-Excavation Topographic Survey of the 100-B-14:1 Subsite.

Figure 4. Post-Excavation Civil Survey of the Northern 100-B-14:1 Subsite.

Figure 5. Post-Excavation Civil Survey of the Central 100-B-14:1 Subsite.

Figure 6. Post-Excavation Civil Survey of the Southwestern 100-B-14:1 Subsite.

Figure 7. Post-Excavation Civil Survey of the Eastern 100-B-14:1 Subsite.

Field Screening

Radiological field screening was conducted during the site remedial actions as specified in the SAP (DOE-RL 2005a). 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, hand-held sodium iodide (NaI) detectors, and gamma energy analyses of grab samples. The radiological mapping survey was performed over the site excavation surface area and overburden stockpiles (Figures 8 and 9); no significant areas of elevated radiological activity were observed, except near the former outfall structure and at a small area in the southeastern portion of the site—additional material was removed at these locations based on the survey results. The hand-held NaI detectors were used to screen excavated waste material and to screen the excavation surfaces for potential hot spots. Gamma energy analyses were used to support waste characterization and to corroborate the radiological mapping survey and hand-held NaI detector data.

Decision Unit Boundaries

The 100-B-14:1 subsite consisted of shallow zone, deep zone, and overburden decision units. The shallow zone consisted of the excavation sidewalls and floors that were less than 4.6 m (15 ft) below ground surface. The deep zone consisted of the portions of the excavation sidewalls and excavation floor that were more than 4.6 m (15 ft) bgs. The overburden decision unit consisted of stockpiled overburden material. The division of the site into decision units is a function of applicable RAGs. The direct exposure, groundwater protection, and river protection RAGs are applicable to soils within 4.6 m (15 ft) of the ground surface (i.e., shallow zone and overburden soil intended for backfill into the shallow zone). The groundwater protection and river protection RAGs are applicable to soils greater than 4.6 m (15 ft) below the ground surface (i.e., deep zone). These decision units were originally grouped into a Phase I and II sampling design, with boundaries shown in Figure 10.

Under the Phase I and II sampling design, the shallow zone decision unit contained eight decision subunits, further divided into four sampling areas per decision subunit. The deep zone decision unit contained three decision subunits, divided into three sampling areas per decision subunit. The initial overburden decision unit contained 22 decision subunits, divided into four sampling areas per subunit. Following detection of elevated carbon-14 activity levels in initial overburden verification samples and removal of material showing the highest activity levels, a new (Phase III) sampling design was generated for the overburden decision unit with respect to carbon-14. Under this design, overburden was grouped into six decision subunits based on spatial boundaries between stockpiles (Figure 11), and further divided into a total of 88 sampling areas.

All sampling areas were further divided into 16 sampling nodes each as shown in the sample design methodology and sample location figures presented in the calculation briefs in Appendix C.

Figure 8. Radiological Mapping Survey Results for the 100-B-14:1 Remediation Footprint.

Figure 9. Radiological Mapping Survey Results for the 100-B-14:1 Overburden Stockpiles.

Figure 10. Phase I and II Verification Sampling Decision Unit Boundaries.

Figure 11. Phase III Verification Sampling Decision Subunit Boundaries.

Variance Sampling

Variance sampling was performed following an initial determination that remedial action objectives had been achieved. Variance sampling was performed at the overburden and shallow zone decision units from May 30 to June 19, 2006, with 192 variance samples collected from the shallow zone decision unit and 528 variance samples collected from the overburden decision unit to support variance analysis. The variance analysis quantifies the variability of residual contamination (see calculation briefs in Appendix C). This information was used to determine the site-specific number of final cleanup verification samples to be collected. The results of the variance analyses indicated that the number of verification samples to be taken for each shallow zone and overburden decision subunit was less than the default number of four specified in the SAP (DOE-RL 2005a); therefore, four final verification samples were collected from each of the shallow zone and overburden decision subunits. The default number of three verification samples (DOE-RL 2005a) were collected from the deep zone decision subunit.

Cleanup Verification Sampling and Analysis

Initial cleanup verification sampling was conducted concurrently with variance sampling from May 30 to June 19, 2006 (WCH 2006a, 2006b). Additional verification sampling for carbon-14 in stockpiled overburden material was conducted from September 19 to 29, 2006 (WCH 2006c). All verification samples were submitted to offsite laboratories for analysis using approved U.S. Environmental Protection Agency analytical methods as required per the SAP (DOE-RL 2005a). Each verification sample was composed of a composite sample formed by combining soil collected at the required number of randomly selected locations within each sampling area (excluding the quality assurance/quality control samples).

CLEANUP VERIFICATION DATA EVALUATION

Verification sampling was performed at the 100-B-14:1 subsite to collect data to determine whether the remedial action objectives had been reached. Based on statistical evaluation of the resulting data, the residual contaminant concentrations meet the cleanup criteria specified in the RDR/RAWP (DOE-RL 2005b) and the Remaining Sites ROD (EPA 1999). The following subsections provide additional discussion of the results of sampling and comparison against RAG requirements to support interim closure of the subsite.

Contaminants of Concern 95% Upper Confidence Limit

The primary statistical calculation to support cleanup verification is the 95% upper confidence limit (UCL) on the arithmetic mean of the data. The 95% UCL values for each COC were computed for each decision unit (i.e., shallow zone, deep zone, and overburden). The 95% UCL values for carbon-14 in overburden soil were computed for each decision subunit grouping identified in the Phase III sampling design (Appendix C). Prior to calculating the 95% UCL, the individual sample results are reviewed and, as appropriate, adjusted per the SAP (DOE-RL 2005a). This process is summarized below.

For radionuclides, the laboratory-reported value is used in the calculation of the 95% UCL. In cases where the laboratory does not report a value for data qualified with a “U” (i.e., less than the detection limit), one-half of the minimum detectable activity is used in the calculation of the 95% UCL. For nonradionuclides, a value equal to one-half of the practical quantitation limit is used for data flagged with a “U” (i.e., less than the detection limit) in the calculation of the 95% UCL, as stipulated by *Washington Administrative Code* (WAC) 173-340-740[7][g].

Hexavalent chromium was detected above applicable RAGs in one initial shallow zone verification sample (J127K8), and carbon-14 was detected above the single-radionuclide 15 mrem/yr dose-equivalence lookup value in two initial shallow zone verification samples (J127P6 and J127R1). Additional soil was removed from these areas and disposed at ERDF and replacement verification samples collected (J13HF3, J13HF4, and J13HF5). Carbon-14 was also detected near or above the single-radionuclide 15 mrem/yr dose-equivalence lookup value in 10 initial (Phase I and II) overburden verification samples. Stockpiled material was removed from the sampling areas with the highest detections and disposed at ERDF and a new (Phase III) sampling design generated for all of the stockpiled overburden with respect to carbon-14. Carbon-14 was not detected in any of the verification samples collected under this design, except in one split sample (1.55 pCi/g), below lookup values, and in one duplicate sample (275 pCi/g), above the single-radionuclide 15 mrem/yr dose-equivalence lookup value. Material from Decision Subunit OB01, Sample Area A1, where elevated carbon-14 was detected in the duplicate sample, and adjacent sampling areas (A2, A3, and A4) (Figure 11) was used to backfill deep zone portions of the 100-B-14:1 excavation. All remaining stockpiled overburden material was used to backfill remaining shallow zone and deep zone portions of the excavation.

Statistical calculations for verification data sets are presented in the 95% UCL calculation brief (Appendix C), with results shown in Table 2. The columns on the left side of Table 2 are the COCs and the 95% UCL values before subtraction of background. The fifth column of Table 2 presents the background, where values exist, and the last three columns present the statistical values adjusted for background, if appropriate, which becomes the cleanup verification data set used for further evaluation and modeling. The 95% UCL values presented for carbon-14 in the overburden are based on the six decision subunit groupings established in the Phase III sample design (Appendix C). Duplicate sample results for carbon-14 in Sample Area A1 of overburden Decision Subunit 01 exceeded the single-radionuclide 15 mrem/yr dose-equivalence lookup value. Overburden material from this area and adjacent Sample Areas A2, A3, and A4 was backfilled exclusively to deep zone portions of the 100-B-14:1 excavation and the primary and duplicate sample results for Sample Area A1 were not included in the 95% UCL calculations for the decision subunit.

Cleanup Verification Model

Because the statistical values summarized in Table 2 were significantly below generic dose-equivalence lookup values, a site-specific cleanup verification model was not developed for the 100-B-14:1 subsite. Evaluation of RAG attainment for radionuclides was performed using the generic dose-equivalence lookup values. The model used to develop these dose-equivalence lookup values is presented in the RDR/RAWP (DOE-RL 2005b).

Table 2. 100-B-14:1 Cleanup Verification Data Set.

COCs	95% UCL Statistical Values ^a (pCi/g)			Hanford Site Background ^b (pCi/g)	Cleanup Verification Data Set ^c (pCi/g)		
	Shallow Zone	Deep Zone	Overburden		Shallow Zone	Deep Zone	Overburden
Carbon-14	0.16 (ND)	0.49 (ND)	01: -0.261 ^d (ND) 02: -0.169 (ND) 03: 0.128 (ND) 04: 0.500 (ND) 05: 0.459 (ND) 06: 0.470 (ND)	NA	0.16 (ND)	0.49 (ND)	01: -0.261 ^d (ND) 02: -0.169 (ND) 03: 0.128 (ND) 04: 0.500 (ND) 05: 0.459 (ND) 06: 0.470 (ND)
Cesium-137	0.159	0.493	0.031	1.1	0.159	0.493	0 (<BG)
Cobalt-60	0.021 (ND)	0.018 (ND)	0.021 (ND)	0.008	0.021 (ND)	0.018 (ND)	0.013 (ND)
Europium-152	0.044 (ND)	0.042 (ND)	0.05 (ND)	NA	0.044 (ND)	0.042 (ND)	0.05 (ND)
Europium-154	0.07 (ND)	0.057 (ND)	0.07 (ND)	0.033	0.07 (ND)	0.057 (ND)	0.04 (ND)
Europium-155	0.06 (ND)	0.053 (ND)	0.06	0.054	0.06 (ND)	0.053 (ND)	0.006
Tritium	-- ^e	-0.83 (ND)	-- ^e	NA	-- ^e	-0.83 (ND)	-- ^e
COC	95% UCL Statistical Values ^a (mg/kg)			Hanford Site Background (mg/kg)	Cleanup Verification Data Set (mg/kg)		
	Shallow Zone	Deep Zone	Overburden		Shallow Zone	Deep Zone	Overburden
Hexavalent chromium	0.91	0.21 (ND)	0.27	NA	0.91	0.21 (ND)	0.27

^a Laboratory data, including the minimum detectable activities for the individual cleanup verification samples, are included in the 95% UCL calculation brief in Appendix C.

^b Represents the 90th percentile of the lognormal distribution (DOE-RL 1996).

^c For overburden, anthropogenic background (DOE-RL 1996) and naturally occurring background is subtracted from all radionuclides. For other decision units (i.e., shallow zone and deep zone), only naturally occurring background (uranium) is subtracted. Refer to the 95% UCL calculation brief in Appendix C for additional details on determination of statistical values.

^d Duplicate sample results for carbon-14 in Sample Area A1 of Decision Subunit 01 exceeded the single-radionuclide 15 mrem/yr dose-equivalence lookup value. Overburden material from this area and adjacent Sample Areas A2, A3, and A4 was backfilled exclusively to deep zone portions of the 100-B-14:1 excavation. The primary and duplicate sample results for Sample Area A1 were not included in the 95% UCL calculations for the decision subunit.

^e Tritium was identified as a COC for the deep zone only.

BG = background

COC = contaminant of concern

NA = not applicable

ND = not detected (in all samples in the data set)

UCL = upper confidence limit

Carbon-14 Leachability Study Results

Modified leaching procedure 1:1 soil to water leach tests were performed on the 100-B-14:1 Phase I and II overburden soil verification samples showing the highest activity levels of carbon-14. Carbon-14 was not detected in the leachate for any sample, as shown in Table 3, indicating that the K_d value for carbon-14 associated with the 100-B-14:1 process sewer overburden soils exceeds the 200 mL/g value listed in the RDR/RAWP (DOE-RL 2005b).

The results for the 100-B-14:1 soils are consistent with those for leach tests performed for soils at the Lewis Canal at the 100-F Area, where soils were known to be contaminated with particulate carbon-14 resulting from graphite borings related to tube-straightening at the reactor. Because the carbon-14 associated with the 100-B-14:1 overburden soils will not leach to groundwater at concentrations that would exceed groundwater or river protection RAGs, it is acceptable to use this material for backfill within the deep zone, with a provision for institutional controls to prevent uncontrolled drilling or excavation into those soils.

It should be noted that the carbon-14 groundwater plumes associated with the 116-KE-1 and 116-KW-1 condensate cribs in the 100-K Area are the result of aqueous/gaseous-phase carbon-14 related to reactor cover gasses. The atmospheres used at the K reactors had a higher nitrogen content than other reactors, resulting in an abundance of carbon-14 from the conversion of nitrogen-14.

Table 3. Modified Leaching Procedure Results for Carbon-14.

Soil Sample Number	C-14 Result (pCi/g)	Leachate C-14 Result (pCi/mL)	Leachate C-14 Duplicate Result (pCi/mL)	Leachate C-14 Triplicate Result (pCi/mL)
J127P6	258	0.225 U	0.241 U	0.038 U
J127R1	178	0.013 U	0.231 U	-0.044 U
J127N5	379	-0.077 U	-0.180 U	-0.022 U
J127K6	208	-0.013 U	-0.200 U	-0.097 U
J127J9	664	-0.180 U	-0.021 U	-0.165 U
J127W8	391	-0.131 U	-0.307 U	-0.071 U
J127T4	83.3	-0.033 U	-0.013 U	-0.129 U
J127N8	79.0	-0.122 U	-0.086 U	-0.145 U
J127N1	25.1	-0.426 U	-0.160 U	-0.194 U

U = undetected

Direct Exposure Soil Remedial Action Goals Attained—Radionuclides

Table 4 compares the shallow zone (including overburden) radionuclide cleanup verification statistically quantified values presented in Table 2 to direct exposure single radionuclide 15 mrem/yr dose-equivalence values and shows the sum-of-fractions evaluations. The columns on the left side of Table 4 are the COCs and the 95% UCL values, corrected for background, as appropriate. The fourth column of Table 4 presents the single radionuclide 15 mrem/yr dose-equivalence activity, and the last two columns present the statistical values divided by the dose-equivalence activity. As demonstrated by the summation of these fractions, the cumulative dose above background contributed by residual radionuclide populations will be significantly less than the 15 mrem/yr RAG. The 95% UCL values presented for carbon-14 in the overburden are based on the six decision subunit groupings established in the Phase III sample design (Appendix C), and the sum-of-fractions evaluation was performed using the highest of the six values.

Table 4. Attainment of Radionuclide Direct Exposure RAG.

COCs	95 % UCL Statistical Values (pCi/g)		Activity Equivalent to 15 mrem/yr Dose ^a (pCi/g)	Fraction	
	Shallow Zone	Overburden		Shallow Zone	Overburden
Carbon-14	0.16 (ND)	01: -0.261 (ND) 02: -0.169 (ND) 03: 0.128 (ND) 04: 0.500 (ND) 05: 0.459 (ND) 06: 0.470 (ND)	5.16 ^b	0.031	0.096 ^c
Cesium-137	0.159	0 (<BG)	6.2	0.026	0
Cobalt-60	0.021 (ND)	0.013 (ND)	1.4	0.015	0.009
Europium-152	0.044 (ND)	0.05 (ND)	3.3	0.013	0.015
Europium-154	0.07 (ND)	0.04 (ND)	3	0.023	0.013
Europium-155	0.06 (ND)	0.006	125	0.000	0.00005
Sum of Fractions				0.109	0.134
Equivalent Dose (mrem/yr)				<1.7	<2.1

^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).

^b Single-radionuclide 15 mrem/yr dose-equivalence value for carbon-14 of 5.16 pCi/g is based on a K_d value of 0 mL/g in the generic RESRAD model. Use of higher K_d values yields higher lookup values (e.g., 8.69 pCi/g for K_d = 200 mL/g [BHI 2004a]).

^c Calculated fraction for carbon-14 in the overburden is based on the highest calculated 95% UCL value (0.500 pCi/g).

BG = background

COC = contaminant of concern

ND = not detected (in all samples in the data set)

RESRAD= RESidual RADioactivity (dose assessment model)

UCL = upper confidence limit

Direct Exposure Soil Remedial Action Goals Attained—Nonradionuclides

Direct Comparison to RAGs. Table 5 compares the shallow zone and overburden cleanup verification statistical values for hexavalent chromium (the sole nonradionuclide COC), to the direct exposure RAG. Residual concentrations of hexavalent chromium are less than the direct exposure RAG.

Table 5. Attainment of Nonradionuclide Direct Exposure RAG.

COC	Direct Exposure RAG (mg/kg)	Cleanup Verification Data Set (mg/kg)	Direct Exposure RAG Attained? ^a
Shallow Zone			
Hexavalent chromium	2.1 ^b 240 ^c	0.91	Yes
Overburden			
Hexavalent chromium	2.1 ^b 240 ^c	0.27	Yes

^a Criterion is comparison to direct exposure RAG.

^b WAC 173-340-750(3) Method B carcinogenic cleanup limit based on the inhalation exposure pathway, per *Calculation of Hexavalent Chromium Carcinogenic Risk* (BHI 2000a).

^c WAC 173-340-740(3) Method B noncarcinogenic cleanup limit.

COC = contaminant of concern

RAG = remedial action goal

WAC = Washington Administrative Code

Noncarcinogenic Hazard Quotient RAG Attained. For noncarcinogenic COCs, WAC 173-340-740(5)(a) and (b) specify the evaluation of the hazard quotient, which is given as daily intake divided by a reference dose (DOE-RL 2005b). This evaluation is shown in the 95% UCL calculation briefs (Appendix C). The calculated hazard quotients for statistical residual hexavalent chromium concentrations (the only nonradionuclide COC) in the shallow zone and overburden decision units are 3.8×10^{-3} and 1.1×10^{-3} , respectively. These values are below the individual and cumulative RAGs (a hazard quotient of <1.0 in both cases).

Carcinogenic Risk RAG Attained. For individual nonradionuclide carcinogenic COCs, the WAC 173-340-700(3) Method B cleanup limits are based on an individual excess cancer risk of 1×10^{-6} . The cumulative excess cancer risk for all nonradionuclide carcinogenic COCs must be less than 1×10^{-5} . The only nonradionuclide COC identified, hexavalent chromium, is a carcinogen in the inhalation exposure pathway. The excess lifetime cancer risk estimate for residual concentrations of this COC in the shallow zone and overburden decision units are 4.3×10^{-7} and 1.3×10^{-7} , respectively. These values are below the risk limit for individual COCs (1×10^{-6}) and the cumulative excess carcinogenic risk RAG of 1×10^{-5} .

Groundwater and River Protection Remedial Action Goals Attained—Radionuclides

Carbon-14, cesium-137 and europium-155, the only radionuclide COCs detected in verification samples from the 100-B-14:1 subsite, are not predicted to reach groundwater within 1,000 years based on the *100 Area Analogous Sites RESRAD Calculations* (BHI 2005). Therefore, the groundwater protection RAGs have been attained. The only pathway for contaminant migration to the Columbia River is via groundwater; therefore, the river protection RAGs have also been attained.

Groundwater and River Protection Remedial Action Goals Attained—Nonradionuclides

Table 6 compares the shallow zone, deep zone, and overburden nonradionuclide cleanup verification statistical values to the soil RAGs for groundwater and river protection. Residual concentrations of hexavalent chromium, the sole nonradionuclide COC, are less than the soil RAGs for groundwater and river protection.

Table 6. Attainment of Nonradionuclide Groundwater and River Protection RAGs.
(2 Pages)

COC	Cleanup Verification Data Set (mg/kg)	Soil RAG for Groundwater Protection (mg/kg)	Soil RAG for River Protection (mg/kg)	Cleanup Criteria Attained? ^a
<i>Shallow Zone</i>				
Hexavalent chromium	0.91	4.8 ^b	2 ^c	Yes
<i>Deep Zone</i>				
Hexavalent chromium	0.21 (ND)	4.8 ^b	2 ^c	Yes

Table 6. Attainment of Nonradionuclide Groundwater and River Protection RAGs.
(2 Pages)

COC	Cleanup Verification Data Set (mg/kg)	Soil RAG for Groundwater Protection (mg/kg)	Soil RAG for River Protection (mg/kg)	Cleanup Criteria Attained? ^a
Overburden				
Hexavalent chromium	0.27	4.8 ^b	2 ^c	Yes

^a Criterion is comparison to soil RAGs for groundwater and river protection.

^b Calculated soil RAG per WAC 173-340-720(3), 1996 (Method B for groundwater) and WAC 173-340-740(3)(a)(ii)(A), 1996 ("100 times rule") is lower than that presented in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 2005b), based on the updated oral reference dose value (as provided in IRIS).

^c Soil RAG based on 100 times dilution attenuation factor times the most restrictive surface water quality standard as presented in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 2005b).

COC = contaminant of concern

IRIS = Integrated Risk Information System

ND = not detected (in all samples in the data set)

RAG = remedial action goal

WAC 173-340 Three-Part Test for Nonradionuclides

The WAC 173-340-740(7)(e) three-part test is required for nonradionuclide statistical verification data sets. The three-part test consists of the following criteria: 1) the cleanup verification statistical value must be less than the most restrictive cleanup level, 2) no single detection within the data set can exceed two times the most restrictive cleanup criteria, and 3) the percentage of samples in the data set exceeding the most restrictive cleanup criteria must be less than 10%.

Table 7 summarizes the results of the WAC 173-340-740[7][e] three-part test for the cleanup verification nonradionuclide data sets in comparison to the most restrictive applicable RAG. The table lists the most restrictive RAG, the statistical value, the maximum detected value, the total number of samples collected, and the percentage of samples exceeding the RAG. The final column of the table describes the result of applying the three criteria using the values listed in the preceding columns. As demonstrated in Table 7, residual concentrations of hexavalent chromium (the sole nonradionuclide COC) in all decision units pass the three-part test in comparison to the most restrictive applicable RAG.

Table 7. Application of the WAC 173-340 Three-Part Test. (2 Pages)

COC	Most Restrictive Applicable RAG ^a	Statistical Cleanup Verification Value (mg/kg) ^b	Maximum Detected Cleanup Verification Value (mg/kg) ^c	Total Number of Samples ^d	Percentage of Cleanup Verification Data Set Exceeding RAG ^e	Cleanup Criteria Attained?
Shallow Zone						
Hexavalent chromium	2 ^f	0.91	0.91	33	0	Yes

Table 7. Application of the WAC 173-340 Three-Part Test. (2 Pages)

COC	Most Restrictive Applicable RAG ^a	Statistical Cleanup Verification Value (mg/kg) ^b	Maximum Detected Cleanup Verification Value (mg/kg) ^c	Total Number of Samples ^d	Percentage of Cleanup Verification Data Set Exceeding RAG ^e	Cleanup Criteria Attained?
Deep Zone						
Hexavalent chromium	2 ^f	0.21 (ND)	ND	10	0	Yes
Overburden						
Hexavalent chromium	2 ^f	0.27	0.75	93	0	Yes

^a The most restrictive RAG for hexavalent chromium is the soil RAG for protection of the Columbia River.

^b Criterion is statistical value cannot exceed most restrictive applicable RAG.

^c Criterion is no single detection can exceed two times the most restrictive applicable RAG.

^d Total number of samples in the decision unit includes field duplicate samples, which are included in the evaluation as separate samples.

^e Criterion is percentage of data set exceeding the most restrictive applicable RAG cannot exceed 10%.

^f Soil RAG based on 100 times dilution attenuation factor times the most restrictive surface water quality standard as presented in the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (DOE-RL 2005b).

COC = contaminant of concern

ND = not detected (in all samples in the data set)

RAG = remedial action goal

WAC = *Washington Administrative Code*

DATA QUALITY ASSESSMENTS

Confirmatory Data

A data quality assessment (DQA) review was performed to compare the confirmatory sampling approach and resulting analytical data with the sampling and data requirements specified by the project objectives and performance specifications. The review involves evaluation of the data to determine if they are of the right type, quality, and quantity to support their intended use (i.e., closeout decisions). The assessment review completes the data life cycle (i.e., planning, implementation, and assessment) that was initiated by the data quality objectives process (EPA 2000).

Specific data quality objectives for the site are found in the SAP (DOE-RL 2005a). The data quality requirements in the SAP are used for assessing data from statistical sampling and do not specifically apply to the data sets resulting from the focused confirmatory sampling performed for the remaining sites. However, to ensure quality data sets, the SAP data quality assurance requirements as well as the data validation procedures for chemical and radiochemical analysis (BHI 2000b, 2000c) are followed, where appropriate.

All analytical data for the main process line site were found acceptable for decision-making purposes. The analysis of the blank sample showed higher-than-historically-seen levels of metals, including total chromium in the field blanks. The laboratory precision results for total

chromium, lead, and nickel were outside the control limits; however, they are within tolerance levels. Data resulting from the metals analysis may be considered estimates.

The DQA review for the main process line site concludes that the data are of the right type, quality, and quantity to support the intended use. The confirmatory sample analytical data are stored in the ENRE Project Site-Specific Database prior to submitting to HEIS and are summarized in Appendix A.

Verification Data

A DQA review 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 (Appendix C). This DQA was performed in accordance with site specific data quality objectives found in the SAP (DOE-RL 2005a).

A review of the sample designs (Appendix C), the field logbooks (WCH 2006a, 2006b, 2006c), and applicable analytical data packages has been performed as part of this DQA. All samples were collected per the sample designs. 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., 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).

Verification sample data collected at the 100-B-14:1 subsite were provided by the laboratories in 23 sample delivery groups (SDGs). The samples are listed by SDG in Table 8. SDGs K0388 and K0584 were submitted for third-party validation. No major deficiencies were identified in the analytical data set, all of which is acceptable for decision-making purposes. Minor deficiencies, as well as third-party validation qualifiers, are discussed below.

Table 8. Sample Delivery Groups for the 100-B-14:1 Subsite. (2 Pages)

Sample Delivery Group	Samples
J00073	J12795
J00076	J127F0
J00077	J127D6 and J127D7
J00082	J127D8, J127D9, and J127F1
J00102	J13HF2
J00103	J13HD8, J13HD9, J13HF0, and J13HF1
K0383	J12782, J12783, J12784, J12785, J12786, J12787, J12788, J12789, J12790, J12791, J127F2, J127F3, J127F4, J127F5, J127F6, J127F7, J127F8, J127F9, J127H0, J127H1, J127H2, and J127H3
K0388	J127H4, J127H5, J127K8, J127K9, J127L0, J127L1, J127L2, and J127L3

Table 8. Sample Delivery Groups for the 100-B-14:1 Subsite. (2 Pages)

Sample Delivery Group	Samples
K0393	J127H6, J127H8, J127H9, J127J0, J127J1, J127J2, J127J3, J127J4, J127J5, J127J6, J127J7, and J127J8
K0401	J127H7, J127J9, J127K0, J127K1, J127K2, J127K3, J127K4, J127K5, J127K6, and J127K7
K0412	J127L4, J127L5, J127L6, J127L7, J127L8, J127L9, J127M0, J127M1, and J127M2
K0415	J127M3, J127M4, J127M5, J127M6, J127M7, J127M8, J127M9, J127N0, J127N1, J127N2, J127N3, J127N4, J127N5, J127N6, J127N7, and J127N8
K0423	J127N9, J127P0, J127P1, J127P2, J127P3, J127P4, J127P5, J127P6, J127P7, J127P8, J127P9, J127R0, and J127R1
K0424	J127R2, J127R3, J127R4, J127R5, J127R6, J127R7, J127R8, J127R9, J127T0, J127T1, J127T2, J127T3, J127T4, J127T5, J127T6, and J127T7
K0430	J127T8, J127T9, J127V0, J127V1, and J127V2
K0433	J127V3, J127V4, J127V5, J127V6, J127V7, J127V8, J127V9, and J127W0
K0439	J127W1, J127W2, J127W3, J127W4, J127W5, J127W6, J127W7, J127W8, J127W9, J127X0, J127X1, J127X2, J127X3, J127X4, J127X5, J127X6, J127X7, and J127X8
K0569	J13FR2, J13FR3, J13FR4, J13FR5, J13FR6, J13FR7, J13FR8, J13FR9, J13FT0, J13FT1, J13FT2, J13FT3, J13FT4, J13FT5, J13FT6, J13FT7, J13FT8, J13FT9, J13FV0, J13FV1, J13FV2, J13FV3, J13FV4, J13FV5, J13FV6, J13FV7, J13FV8, J13FV9, J13FW0, J13FW1, J13FW2, J13FW3, J13FW4, J13FW5, J13FW6, and J13FW7
K0574	J13H00, J13H01, J13H02, J13H03, J13H04, J13FW8, J13FW9, J13FX0, J13FX1, J13FX2, J13FX3, J13FX4, J13FX5, J13FX6, J13FX7, J13FX8, J13FX9, J13FY0, J13FY1, J13FY2, J13FY3, J13FY4, J13FY5, J13FY6, J13FY7, J13FY8, and J13FY9
K0577	J13H05, J13H06, J13H07, J13H08, J13H09, J13H10, J13H12, J13H13, J13H14, J13H15, J13H16, J13H17, J13H18, J13H19, J13H20, J13H21, J13H22, J13H23, J13H24, and J13H25
K0584	J13H11, J13H26, J13H27, J13H28, J13H29, J13HD2, and J13HD3
K0587	J13HD4, J13HD5, J13HD6, J13HD7, J13HF4, and J13HF5
K0591	J13HF3

The contract required quantitation limit (CRQL) for carbon-14 is based on current analytical method capabilities. Actual detection limits vary by analytical batch and by sample. Because of this, the laboratories do not always achieve the CRQLs for carbon-14. With the exception of the split samples, the minimum detectable activities (MDAs) of all samples submitted for carbon-14 in the 100-B-14:1 data set are above the CRQL (1 pCi/g). The reported MDAs are in the range of 1.9 pCi/g to 4.4 pCi/g, most under 3.0 pCi/g. These are all below the single-radionuclide 15 mrem/yr dose-equivalence lookup value (5.16 pCi/g). These small exceedances were not qualified by third-party validation in the validated SDGs and would not result in an exceedance of the sum-of-fractions (cumulative dose) evaluation for the 100-B-14:1 waste site. The data are useable for decision-making purposes.

The 100-B-14:1 waste site comprises multiple decision units. Samples from several decision units may compose any one SDG. Unless otherwise noted, deficiencies listed below are specific to the individual SDG, but apply to all samples within that SDG.

SDG J00073 comprises the field split of the deep zone A2 sample, analyzed for carbon-14, tritium, hexavalent chromium, and by gamma spectroscopy. No major or minor deficiencies were found in SDG J00073. The data are useable for decision-making purposes.

SDG J00076 comprises the field split of the shallow zone B6 sample, analyzed for carbon-14, tritium, hexavalent chromium, and by gamma spectroscopy. No major deficiencies were found in SDG J00076. Minor deficiencies are as follows:

Insufficient sample material was collected to allow a duplicate sample to be prepared. Therefore, the precision determination was accomplished by counting the sample on two separate detectors. This is acceptable, and the data are useable for decision-making purposes.

SDG J00077 comprises two field splits of the overburden P2 and P3 samples, analyzed for carbon-14, tritium, hexavalent chromium, and by gamma spectroscopy. No major or minor deficiencies were found in SDG J00077.

SDG J00082 comprises three field splits of the overburden L5, L6 and M10 samples, analyzed for carbon-14, tritium, hexavalent chromium, and by gamma spectroscopy. No major deficiencies were found in SDG J00082. Minor deficiencies are as follows:

In the hexavalent chromium analysis, the matrix spike (MS) had a low recovery at 32%. Because the laboratory control sample (LCS) had a recovery of 96%, the analytical system was shown to be working. The low MS recovery indicates that the reduction/oxidation conditions of the sample are such that much of the added hexavalent chromium spike was reduced to trivalent chromium. Under these conditions, it would be predicted that no hexavalent chromium would exist in the original field sample. This prediction is confirmed by the sample result (the sample from which the MS was prepared), which was non-detected for hexavalent chromium. The data are useable for decision-making purposes.

SDG J00101 comprises the field splits of the 0B01 A1, 0B01 C2, 0B04 A1, and 0B06 A4 samples, analyzed for carbon-14. No major or minor deficiencies were found in SDG J00101.

SDG J00102 comprises the field split of the 0B05 A1 sample, analyzed for carbon-14. No major or minor deficiencies were found in SDG J00102.

SDG K0383 comprises 22 field samples collected from the shallow zone, deep zone, and overburden decision units. These samples were analyzed for tritium, carbon-14, hexavalent chromium, and by gamma spectroscopy. No major deficiencies were found in SDG K0383. Minor deficiencies are as follows:

The relative percent difference (RPD) calculated for radium-226 in the second laboratory duplicate pair (sample J127H2 and its laboratory duplicate), is above the acceptance criteria at 51%. 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.

SDG K0388 comprises eight field samples collected from the shallow zone and overburden decision units. These samples were analyzed for tritium, carbon-14, hexavalent chromium, and by gamma spectroscopy. SDG K0388 was submitted for formal third-party validation. No major deficiencies were found in SDG K0388. Minor deficiencies and third-party validation qualifiers are as follows:

Due to a lack of MS analysis, third-party validation qualified all tritium results in SDG K0388 as estimates with “J” flags. Tritium is not amenable to MS analysis. The laboratory employs other methods to make the precision determination. However, the current validation procedure does not account for this. The validation process has correctly qualified the data under that procedure. The data are acceptable for decision-making purposes.

SDG K0393 comprises 12 field samples collected from the shallow zone and overburden decision units. These samples were analyzed for carbon-14, hexavalent chromium, and by gamma spectroscopy. Two field duplicate pairs are included in this SDG (J127J5/J127J6 and J127J7/J127J8). No major deficiencies were found in SDG K0393. Minor deficiencies are as follows:

The RPD calculated for thorium-228 in the laboratory duplicate was 1% above the acceptance criteria range at 31%. 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.

SDG K0401 comprises 10 field samples collected from the overburden decision unit. These samples were analyzed for carbon-14, hexavalent chromium, and by gamma spectroscopy. No major or minor deficiencies were found in SDG K0401. The data are useable for decision-making purposes.

SDG K0412 comprises nine field samples collected from the shallow zone decision unit. These samples were analyzed for carbon-14, hexavalent chromium, and by gamma spectroscopy. No major deficiencies were found in SDG K0412. Minor deficiencies are as follows:

In the analysis of the laboratory duplicate, the analyte hexavalent chromium was detected just above the detection limit. In the original sample, hexavalent chromium was non-detected. The laboratory reported an RPD value for these results of 72.7%. However, when one of the two samples is non-detected or when the duplicate pair is near the detection limit, analysis of RPDs is not considered useful in the precision determination. The data are useable for decision-making purposes.

SDG K0415 comprises 16 field samples, one collected from the shallow zone decision unit, and the rest from the overburden decision unit. Three field duplicate pairs are included in this SDG (J127M5/J127M6, J127M8/J127M9, and J127N2/J127N3). Samples in this SDG were analyzed for carbon-14, hexavalent chromium, and by gamma spectroscopy. No major deficiencies were found in SDG K0415. Minor deficiencies are as follows:

In the analysis of the laboratory duplicate, the analyte hexavalent chromium was detected just above the detection limit. In the original sample, hexavalent chromium was non-detected. The laboratory reported an RPD value for these results of 87%. However, when one of the two samples is non-detected or when the duplicate pair is near the detection limit, analysis of RPDs is not considered useful in the precision determination. The data are useable for decision-making purposes.

SDG K0423 comprises 13 field samples, collected from the shallow zone and overburden decision units. Samples in this SDG were analyzed for carbon-14, hexavalent chromium, and by gamma spectroscopy. No major deficiencies were found in SDG K0423. Minor deficiencies are as follows:

In the analysis of the laboratory duplicate, the analyte hexavalent chromium was not detected. In the original sample, hexavalent chromium was detected just above the detection limit. The laboratory reported an RPD value for these results of 66.7%. However, when one of the two samples is non-detected or when the duplicate pair is near the detection limit, analysis of RPDs is not considered useful in the precision determination. The data are useable for decision-making purposes.

SDG K0424 comprises 16 field samples, collected from the overburden decision unit. Samples in this SDG were analyzed for carbon-14, hexavalent chromium, and by gamma spectroscopy. No major deficiencies were found in SDG K0424. Minor deficiencies are as follows:

In the analysis of the laboratory duplicate, the analyte hexavalent chromium was detected just above the detection limit. In the original sample, hexavalent chromium was non-detected. The laboratory reported an RPD value for these results of 142.1%. However, when one of the two samples is non-detected or when the duplicate pair is near the detection limit, analysis of RPDs is not considered useful in the precision determination. The data are useable for decision-making purposes.

SDG K0430 comprises five field samples, collected from the overburden decision unit. Samples in this SDG were analyzed for carbon-14, hexavalent chromium, and by gamma spectroscopy. No major deficiencies were found in SDG K0430. Minor deficiencies are as follows:

In the analysis of the laboratory duplicate, the analyte hexavalent chromium was not detected. In the original sample, hexavalent chromium was detected just above the detection limit. The laboratory reported an RPD value for these results of 142.8%. However, when one of the two samples is non-detected or when the duplicate pair is near the detection limit, analysis of RPDs is not considered useful in the precision determination. The data are useable for decision-making purposes.

SDG K0433 comprises eight field samples, collected from the overburden decision unit. Samples in this SDG were analyzed for carbon-14, hexavalent chromium, and by gamma spectroscopy. No major or minor deficiencies were found in SDG K0433.

SDG K0439 comprises 16 field samples, collected from the overburden decision unit. Samples in this SDG were analyzed for carbon-14, hexavalent chromium, and by gamma spectroscopy. No major deficiencies were found in SDG K0439. Minor deficiencies are as follows:

In the analysis of the laboratory duplicate, the analyte hexavalent chromium was not detected. In the original sample, hexavalent chromium was detected just above the detection limit. The laboratory reported an RPD value for these results of 41.8%. However, when one of the two samples is non-detected or when the duplicate pair is near the detection limit, analysis of RPDs is not considered useful in the precision determination. The data are useable for decision-making purposes.

SDG K0569 comprises 36 field samples, collected from the OB01 and OB03 decision subunits. Samples in this SDG were analyzed for carbon-14. No major deficiencies were found in SDG K0569. Minor deficiencies are as follows:

One of the LCS results for carbon-14 is below the lower laboratory control limit at 73%. This value is within the project-specific acceptance range (70-130%). The data are useable for decision-making purposes.

SDG K0574 comprises 26 field samples, collected from the OB01, OB04 and OB06 decision subunits. An equipment blank (J13FW8) is also part of SDG K0574. The samples were analyzed for carbon-14. No major or minor deficiencies were found in SDG K0574. The data are useable for decision-making purposes.

SDG K0577 comprises 20 field samples, collected from the OB05 and OB06 decision subunits. Samples in this SDG were analyzed for carbon-14. No major or minor deficiencies were found in SDG K0577.

SDG K0584 comprises seven field samples, collected from the OB04 and OB05 decision subunits. Samples in this SDG were analyzed for carbon-14. SDG K0584 was submitted for formal third-party validation. No major or minor deficiencies were found in SDG K0584.

SDG K0587

This SDG comprises six field samples from the 100-B-14:1 subsite, collected from the shallow zone decision unit and the OB01 and OB05 decision subunits. The 100-B-14:1 samples in this SDG were analyzed for carbon-14. No major or minor deficiencies were found in SDG K0587.

SDG K0591 comprises one field sample from the 100-B-14:1 subsite, collected from the shallow zone. The 100-B-14:1 sample in this SDG was analyzed for hexavalent chromium. No major or minor deficiencies were found in SDG K0591.

Field Quality Assurance/Quality Control. RPD evaluations of main samples versus the laboratory duplicates are routinely performed and reported by the laboratory. Any deficiencies in those calculations are reported by SDG in the previous sections.

Field quality assurance/quality control (QA/QC) measures are used to assess potential sources of error and cross-contamination of samples that could bias results. The field QA/QC samples for the 100-B-14:1 subsite verification sampling events are listed in Table 9. The main and QA/QC sample results are presented with the statistical calculations in Appendix C.

Table 9. Field Quality Assurance/Quality Control Samples.

Sample Area	Main Sample	Duplicate Sample	Split Sample
Shallow Zone B6	J127L2	J127L3	J127F0
Deep Zone A2	J12784	--	J12795
Deep Zone A3	J12783	J12791	--
Overburden L5	J127N2	J127N3	J127F1
Overburden L6	J127M8	J127M9	J127D9
Overburden M10	J127M5	J127M6	J127D8
Overburden P2	J127J5	J127J6	J127D6
Overburden P3	J127J7	J127J8	J127D7
Overburden 01 A1	J13FW9	J13FX0	J13HD8
Overburden 01 C2	J13FX9	J13FY0	J13HD9
Overburden 04 A1	J13FY1	J13FY2	J13HF0
Overburden 05 A1	J13H05	J13H09	J13HF2
Overburden 06 A4	J13H03	J13H04	J13HF1

Field duplicate samples are collected to provide a relative measure of the 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 COC. Only analytes with values above five times the detection limits for both the main and duplicate samples are compared. The 95% UCL calculation brief in Appendix C provides details on duplicate pair evaluation and RPD calculation. The data are suitable for the intended purpose of cleanup verification.

Split samples are collected to provide a relative measure of the variability in the sampling, sample handling, and analytical techniques used by commercial laboratories. The field main and split samples are evaluated by computing the RPD of the split samples for each COC to determine the usability of the verification data. The U.S. Environmental Protection Agency Contract Laboratory Program duplicate sample comparison methodology, *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA 1994), is used as an initial test of the data from the splits. Only analytes that had values above five times the contractual CRQL for both the main and split sample were compared. The 95% UCL calculation brief in Appendix C provides details on split pair RPD calculation. The acceptance criteria RPD for project-split samples is $\leq 30\%$ (less than or equal to 30%).

The RPDs calculated for potassium-40 in the shallow zone B6, the overburden M10, and the overburden P2 duplicates are above the acceptance criteria (30%) at 38%, 55%, and 60%, respectively. The RPDs calculated for radium-226 in the overburden M10, and the overburden P2 duplicates are above the acceptance criteria (30%) at 67%, and 52%, respectively. Elevated RPDs, such as these, in the analysis of environmental soil samples, are largely attributed to heterogeneities in the soil matrix and only in small part attributed to precision and accuracy issues at the laboratory. The data are useable for decision-making purposes.

None of the RPDs calculated for nonradionuclide analytes in field duplicates or splits were above the acceptance criteria. The data are useable for decision-making purposes.

The RPDs for the remaining radionuclides and nonradionuclide analytes were either within the acceptance criteria or were not calculated, because an evaluation of the data shows the analytes were not detected in both the main and duplicate (or main and split) sample at more than five times the target detection limit. The RPDs of analytes detected at low concentrations (less than five times the detection limit) are not considered indicative of the analytical system performance. The data are useable for decision-making purposes.

A secondary check of the data variability is used when one or both of the samples being evaluated (main and duplicate or main and split) is less than 5 times the target detection limit (TDL), including undetected analytes. In these cases, a control limit of ± 2 times the TDL is used (Appendix C) to indicate that a visual check of the data is required by the reviewer. The radium-228 results for the overburden M10 and the overburden P2 duplicates required this check. These results are also attributed to heterogeneities in the sample matrix from which the samples were collected. A visual inspection of all of the data is also performed. No major, or other minor, deficiencies were 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 issue for any analysis. The number and types seen in these data sets were within expectations for the matrix types and analyses performed. The DQA review of the 100-B-14:1 verification sampling data found that the analytical results are accurate within the standard errors associated with the analytical methods, sampling, and sample handling. The DQA review for the 100-B-14:1 subsite 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 submittal for inclusion in the HEIS database. The verification sample analytical data are also summarized in the 95% UCL calculation in Appendix C.

SUMMARY FOR INTERIM CLOSURE

The 100-B-14:1 subsite has been evaluated and remediated in accordance with the Remaining Sites ROD (EPA 1999) and the RDR/RAWP (DOE-RL 2005b). Because chemical and

radionuclide contaminants were detected within the pipeline and in underlying soil, the site was remediated by removing piping and surrounding soils and transporting them to ERDF. Statistical sampling to verify the completeness of remediation was performed, and the analytical results meet the cleanup objectives for direct exposure, groundwater protection, and river protection. In accordance with this evaluation, the verification sampling results support a reclassification of the 100-B-14:1 subsite to interim closed out. Deep zone soils have not been evaluated against direct exposure requirements, and institutional controls are required to prevent uncontrolled drilling/excavation into the deep zone.

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APPENDIX A

CONFIRMATORY SAMPLING AND WASTE CHARACTERIZATION ANALYTICAL RESULTS

Note: This appendix contains the confirmatory sample results that led to a decision that remediation was necessary. Verification sampling results and calculations to support reclassification of the subsite to interim closed out are provided in Appendix C.

Table A-1. 100-B-14:1 Confirmatory Data Results. (6 Pages)

Sample Location	Sample Number	Sample Date	Americium-241			Carbon-14			Cesium-137			Cobalt-60			Europium-152			Europium-154		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
B2	J00YY5	10/8/03	0.96	U	0.96	--		--	59.6		0.64	5.19		0.3	55.3		1.1	5.6		1
B4	J00YY6	10/14/03	0.096	U	0.096	--		--	0.041	U	0.041	0.042	U	0.042	0.1	U	0.1	0.13	U	0.13
Duplicate of J00YY6	J00YY7	10/14/03	0.3	U	0.3	--		--	0.053	U	0.053	0.075	U	0.075	0.15	U	0.15	0.21	U	0.21
B1	J00YY1	10/8/03	0.039	U	0.039	--		--	1.48		0.043	0.682		0.029	2.86		0.07	0.514		0.086
B3	J00YY2	10/14/03	5.23		3.1	369		3.7	1760		1.7	71.9		0.56	105		4.1	19.2		1.6

Sample Location	Sample Number	Sample Date	Europium-155			Gross alpha			Gross beta			Nickel-63			Plutonium-238			Plutonium-239/240		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
B2	J00YY5	10/8/03	1.1	U	1.1	4.51	U	4.8	88.2		7.4	--		--	--		--	--		--
B4	J00YY6	10/14/03	0.093	U	0.093	1.81	U	3.9	11		6.1	--		--	--		--	--		--
Duplicate of J00YY6	J00YY7	10/14/03	0.15	U	0.15	2.15	U	3.8	10.7		6	--		--	--		--	--		--
B1	J00YY1	10/8/03	0.072	U	0.072	10.4		7.5	6.93	U	7.9	--		--	--		--	--		--
B3	J00YY2	10/14/03	2.1	U	2.1	11		3.5	1690		7.2	374		2.3	0.698		0.036	13.2		0.029

Sample Location	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Thorium-228			Thorium-232			Total beta Radiostromtium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
B2	J00YY5	10/8/03	12.7		1.9	0.716		0.71	1.6	U	1.6	0.868		0.52	1.6	U	1.6	0.424		0.23
B4	J00YY6	10/14/03	6.81		0.38	0.29		0.077	0.276		0.2	0.367		0.047	0.276		0.2	--		--
Duplicate of J00YY6	J00YY7	10/14/03	6.08		0.73	0.216		0.13	0.324		0.29	0.332		0.067	0.324		0.29	--		--
B1	J00YY1	10/8/03	0.6	U	0.6	0.632		0.072	0.294		0.15	0.599		0.053	0.294		0.15	--		--
B3	J00YY2	10/14/03	16		2.5	1.9	U	1.9	2.5	U	2.5	1.3	U	1.3	2.5	U	2.5	21.2		0.3

Sample Location	Sample Number	Sample Date	Tritium			Uranium-235			Uranium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
B2	J00YY5	10/8/03	--		--	1.5	U	1.5	47	U	47
B4	J00YY6	10/14/03	--		--	0.12	U	0.12	5.9	U	5.9
Duplicate of J00YY6	J00YY7	10/14/03	--		--	0.21	U	0.21	7.4	U	7.4
B1	J00YY1	10/8/03	--		--	0.11	U	0.11	4.6	U	4.6
B3	J00YY2	10/14/03	310		4.7	3.5	U	3.5	75	U	75

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

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

-- = not analyzed

B = method blank contamination (organic constituents)

C = method blank contamination (organic constituents)

D = diluted (organic constituents)

J = estimate

MDA = minimum detectable activity

PQL = practical quantitation limit

Q = qualifier

TCLP = toxicity characteristic leaching procedure

U = undetected

Table A-1. 100-B-14:1 Confirmatory Data Results. (6 Pages)

Sample Location	Sample 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
B2	J00YY5	10/8/03	10100		4.7	0.43		0.29	4.5		0.42	151		0.02	0.16		0.04	1.2		0.22
B4	J00YY6	10/14/03	3370		3.6	0.22	U	0.22	1.5		0.32	40.3		0.02	0.18		0.03	0.58		0.17
Duplicate of J00YY6	J00YY7	10/14/03	3310		3.9	0.24	U	0.24	1.2		0.35	36.3		0.02	0.19		0.03	0.41		0.18
Equipment Blank	J00YY8	10/14/03	58.4		3.9	0.24	U	0.24	0.35	U	0.36	1.2		0.02	0.03	U	0.03	0.18	U	0.18
B1	J00YY1	10/8/03	6100		4.2	0.41		0.26	8.9		0.38	469		0.02	0.14		0.04	3.3		0.2
B3	J00YY2	10/14/03	17100		4.7	4.4		0.29	16.3		0.42	320		0.02	0.68		0.04	10		0.22

Sample Location	Sample 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
B2	J00YY5	10/8/03	1.7		0.04	6880		3.1	65.9		0.1	11.2		0.12	32.2		0.12	3.9		0.44
B4	J00YY6	10/14/03	0.03	U	0.03	5240		2.4	3		0.08	9.7		0.09	16.3		0.09	0.41	U	0.41
Duplicate of J00YY6	J00YY7	10/14/03	0.03	U	0.03	4710		2.6	3.1		0.08	7.9		0.1	15.8		0.1	0.41	U	0.41
Equipment Blank	J00YY8	10/14/03	0.03	U	0.03	28.5		2.6	45.6		0.08	0.15		0.1	0.85		0.1	0.4	U	0.4
B1	J00YY1	10/8/03	8		0.04	295000		66.8	31.4		0.09	6.8		0.11	107		0.11	--		--
B3	J00YY2	10/14/03	5.2		0.04	10500		3.1	368		0.1	14.9		0.12	766		0.12	--		--
B1	J00YY3	10/8/03	--		--	--		--	--		--	--		--	--		--	0.617		0.35
B3	J00YY4	10/14/03	--		--	--		--	--		--	--		--	--		--	16.4		0.35

Table A-1. 100-B-14:1 Confirmatory Data Results. (6 Pages)

Sample Location	Sample 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
B2	J00YY5	10/8/03	28900		2	9.6		0.19	6200		0.7	508		0.03	1.4		0.02	0.63		0.19
B4	J00YY6	10/14/03	24800		1.5	1.8		0.15	3560		0.54	301		0.02	0.02	U	0.02	0.4		0.15
Duplicate of J00YY6	J00YY7	10/14/03	23200		1.7	1.5		0.16	3020		0.58	243		0.03	0.02	U	0.02	0.33		0.16
Equipment Blank	J00YY8	10/14/03	321		1.6	0.16	U	0.16	7.7		0.58	4.9		0.02	0.01	U	0.01	0.87		0.16
B1	J00YY1	10/8/03	13700		1.8	67.1		0.17	4910		0.63	358		0.03	9.4		0.16	0.27		0.17
B3	J00YY2	10/14/03	50000		23.8	914		0.19	9470		0.7	573		0.03	74.4		0.83	3.8		0.19

Sample Location	Sample 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
B2	J00YY5	10/8/03	22.6		0.2	1250		2.4	0.5		0.29	271		0.54	0.31		0.08	228		0.71
B4	J00YY6	10/14/03	6		0.15	525		1.8	0.22	U	0.22	300		0.42	0.06	U	0.06	261		0.55
Duplicate of J00YY6	J00YY7	10/14/03	5.1		0.17	506		2	0.24	U	0.24	299		0.45	0.07	U	0.07	263		0.59
Equipment Blank	J00YY8	10/14/03	10.5		0.17	22.8		1.9	0.24	U	0.24	52.7		0.45	0.07	U	0.07	6.1		0.59
B1	J00YY1	10/8/03	11.6		0.18	686		2.1	0.31		0.26	1090		0.48	1.1		0.07	335		0.64
B3	J00YY2	10/14/03	41.6		0.2	3010		2.4	0.29	U	0.29	422		0.54	0.74		0.08	1200		0.71

Sample Location	Sample Number	Sample Date	Vanadium			Zinc		
			mg/Kg	Q	PQL	mg/Kg	Q	PQL
B2	J00YY5	10/8/03	63.1		0.09	168		0.26
B4	J00YY6	10/14/03	58.4		0.07	39.9		0.2
Duplicate of J00YY6	J00YY7	10/14/03	65.3		0.08	36.9		0.22
Equipment Blank	J00YY8	10/14/03	0.23		0.07	0.69		0.21
B1	J00YY1	10/8/03	12.3		0.08	757		0.23
B3	J00YY2	10/14/03	78.6		0.09	1460		3.1

Table A-1. 100-B-14:1 Confirmatory Data Results. (6 Pages)

Constituent	J00YY1 Sample Area B1 Sample Date 10/8/03			J00YY2 Sample Area B3 Sample Date 10/14/03			J00YY5 Sample Area B2 Sample Date 10/8/03			J00YY6 Sample Area B4 Sample Date 10/14/03			J00YY7 Duplicate of B4 Sample Date 10/14/03			J00YY8 Equipment Blank Sample Date 10/14/03		
	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
	Polychlorinated Biphenyls																	
Aroclor-1016	13	U	13	140	U	140	15	U	15	14	U	14	14	U	14	13	U	13
Aroclor-1221	13	U	13	140	U	140	15	U	15	14	U	14	14	U	14	13	U	13
Aroclor-1232	13	U	13	140	U	140	15	U	15	14	U	14	14	U	14	13	U	13
Aroclor-1242	13	U	13	140	U	140	15	U	15	14	U	14	14	U	14	13	U	13
Aroclor-1248	13	U	13	140	U	140	15	U	15	14	U	14	14	U	14	13	U	13
Aroclor-1254	13	U	13	140	U	140	15	U	15	14	U	14	14	U	14	13	U	13
Aroclor-1260	13	U	13	1100		140	15	U	15	14	U	14	14	U	14	13	U	13
Semivolatile Organic Compounds																		
1,2,4-Trichlorobenzene	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
1,2-Dichlorobenzene	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
1,3-Dichlorobenzene	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
1,4-Dichlorobenzene	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
2,4,5-Trichlorophenol	840	U	840	17000	UD	17000	4600	UD	4600	860	U	860	860	U	860	840	U	840
2,4,6-Trichlorophenol	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
2,4-Dichlorophenol	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
2,4-Dimethylphenol	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
2,4-Dinitrophenol	840	U	840	17000	UD	17000	4600	UD	4600	860	U	860	860	U	860	840	U	840
2,4-Dinitrotoluene	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
2,6-Dinitrotoluene	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
2-Chloronaphthalene	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
2-Chlorophenol	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
2-Methylnaphthalene	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
2-Methylphenol (cresol, o-)	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
2-Nitroaniline	840	U	840	17000	UD	17000	4600	UD	4600	860	U	860	860	U	860	840	U	840
2-Nitrophenol	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330

Table A-1. 100-B-14:1 Confirmatory Data Results. (6 Pages)

Constituent	J00YY1 Sample Area B1 Sample Date 10/8/03			J00YY2 Sample Area B3 Sample Date 10/14/03			J00YY5 Sample Area B2 Sample Date 10/8/03			J00YY6 Sample Area B4 Sample Date 10/14/03			J00YY7 Duplicate of B4 Sample Date 10/14/03			J00YY8 Equipment Blank Sample Date 10/14/03		
	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
	Semivolatile Organic Compounds (continued)																	
3,3'-Dichlorobenzidine	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
3-Nitroaniline	840	U	840	17000	UD	17000	4600	UD	4600	860	U	860	860	U	860	840	U	840
4,6-Dinitro-2-methylphenol	840	U	840	17000	UD	17000	4600	UD	4600	860	U	860	860	U	860	840	U	840
4-Bromophenylphenyl ether	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
4-Chloro-3-methylphenol	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
4-Chloroaniline	340	U	340	1500	JD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
4-Chlorophenylphenyl ether	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
4-Methylphenol (cresol, p-)	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
4-Nitroaniline	840	U	840	17000	UD	17000	4600	UD	4600	860	U	860	860	U	860	840	U	840
4-Nitrophenol	840	U	840	17000	UD	17000	4600	UD	4600	860	U	860	860	U	860	840	U	840
Acenaphthene	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Acenaphthylene	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Anthracene	340	U	340	1200	JD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Benzo(a)anthracene	340	U	340	4400	JD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Benzo(a)pyrene	340	U	340	4800	JD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Benzo(b)fluoranthene	340	U	340	6000	JD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Benzo(ghi)perylene	340	U	340	3600	JD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Benzo(k)fluoranthene	340	U	340	4800	JD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Bis(2-chloro-1-methylethyl)ether	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Bis(2-Chloroethoxy)methane	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Bis(2-chloroethyl) ether	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Bis(2-ethylhexyl) phthalate	39	J	340	32000	D	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Butylbenzylphthalate	340	U	340	460	JD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Carbazole	340	U	340	1000	JD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Chrysene	340	U	340	6200	JD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Di-n-butylphthalate	340	U	340	4100	JD	6900	1800	UD	1800	340	U	340	340	U	340	18	J	330
Di-n-octylphthalate	340	U	340	4600	JD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330

Table A-1. 100-B-14:1 Confirmatory Data Results. (6 Pages)

Constituent	J00YY1			J00YY2			J00YY5			J00YY6			J00YY7			J00YY8		
	Sample Area B1			Sample Area B3			Sample Area B2			Sample Area B4			Duplicate of B4			Equipment Blank		
	Sample Date 10/8/03			Sample Date 10/14/03			Sample Date 10/8/03			Sample Date 10/14/03			Sample Date 10/14/03			Sample Date 10/14/03		
	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL	ug/kg	Q	PQL
Semivolatile Organic Compounds (continued)																		
Dibenz[a,h]anthracene	340	U	340	850	JD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Dibenzofuran	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Diethylphthalate	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Dimethyl phthalate	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Fluoranthene	23	J	340	12000	D	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Fluorene	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Hexachlorobenzene	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Hexachlorobutadiene	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Indeno(1,2,3-cd)pyrene	340	U	340	3200	JD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Isophorone	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
N-Nitroso-di-n-dipropylamine	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
N-Nitrosodiphenylamine	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Naphthalene	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Nitrobenzene	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Pentachlorophenol	840	U	840	17000	UD	17000	4600	UD	4600	860	U	860	860	U	860	840	U	840
Phenanthrene	340	U	340	4500	JD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Phenol	340	U	340	6900	UD	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330
Pyrene	340	U	340	8600	D	6900	1800	UD	1800	340	U	340	340	U	340	330	U	330

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Sample Location	Sample Number	Sample Date	Actinium-228			Americium-241			Carbon-14			Cesium-137		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Stockpile	J02MN5	3/7/05	--		--	0.32	U	0.32	-0.898	U	4	0.041	U	0.041
South loadout	J032Y0	4/21/05	--		--	0.095	U	0.095	--		--	0.036	U	0.036
South loadout	J032Y1	4/21/05	--		--	0.14	U	0.14	--		--	0.032	U	0.032
South loadout	J032Y2	4/21/05	--		--	0.11	U	0.11	--		--	0.046	U	0.046
North BCL	J032Y5	5/23/05	0.958		0.518	0.0375	U	0.148	--		--	-0.037	U	0.192
North BCL	J032Y7	5/23/05	0.827		0.788	0.0105	U	0.181	--		--	0.0646	U	0.23
North BCL	J032Y8	5/23/05	0.882		0.703	-0.0291	U	0.14	--		--	-0.0201	U	0.18
Equip. Blank	J032Y9	5/23/05	--		--	0.16	U	0.16	--		--	0.079	U	0.079
North BCL	J03300	5/23/05	--		--	0.24	U	0.24	--		--	0.066	U	0.066
Dup of J03300	J03301	5/23/05	--		--	0.087	U	0.087	--		--	0.085	U	0.085
North BCL	J03302	5/23/05	--		--	0.2	U	0.2	--		--	0.085	U	0.085
North BCL	J03303	5/23/05	--		--	0.25	U	0.25	--		--	0.06	U	0.06
North BCL	J036V5	5/23/05	0.849		0.699	0.066	U	0.162	--		--	-0.109	U	0.192
North BCL	J036V7	5/23/05	--		--	0.085	U	0.085	--		--	0.088	U	0.088
North BCL	J036V8	5/23/05	--		--	0.21	U	0.21	--		--	0.084	U	0.084
North BCL	J036V9	5/23/05	--		--	0.28	U	0.28	--		--	0.074	U	0.074
North BCL	J036W2	5/26/05	--		--	0.064	U	0.064	--		--	0.025	U	0.025
North BCL	J036W3	5/25/05	--		--	0.083	U	0.083	--		--	0.02	U	0.02
North BCL	J036W4	6/1/05	--		--	0.34	U	0.34	--		--	0.079	U	0.079
North BCL	J036W5	6/1/05	--		--	0.24	U	0.24	--		--	0.1	U	0.1
North loadout	J03D21	6/22/05	--		--	0.083	U	0.083	--		--	0.084	U	0.084
North loadout	J03D22	6/22/05	--		--	0.28	U	0.28	--		--	0.11	U	0.11
North loadout	J03D23	6/22/05	--		--	0.098	U	0.098	--		--	0.096	U	0.096
BCL stockpile	J03JN2	6/29/05	--		--	0.17	U	0.17	--		--	0.045	U	0.045
BCL stockpile	J03JN3	6/29/05	--		--	0.19	U	0.19	--		--	0.058	U	0.058
BCL stockpile	J03JN4	6/29/05	--		--	0.23	U	0.23	--		--	0.086	U	0.086
BCL stockpile	J03JN5	6/29/05	--		--	0.099	U	0.099	--		--	0.11	U	0.11
South loadout	J03JT6	6/30/05	--		--	0.22	U	0.22	--		--	0.065	U	0.065
BCL stockpile	J03JV0	7/1/05	--		--	0.24	U	0.24	--		--	0.097	U	0.097
BCL stockpile	J03JV1	7/1/05	--		--	0.2	U	0.2	--		--	0.067	U	0.067
BCL stockpile	J03JV3	7/1/05	--		--	0.22	U	0.22	--		--	0.099	U	0.099
BCL stockpile	J03JV5	7/1/05	--		--	0.27	U	0.27	--		--	0.073	U	0.073
BCL stockpile	J03JV6	7/1/05	--		--	0.23	U	0.23	--		--	0.064	U	0.064
North stockpile	J03JV7	7/7/05	--		--	0.26	U	0.26	--		--	0.074	U	0.074
North stockpile	J03JV8	7/7/05	--		--	0.35	U	0.35	--		--	0.078	U	0.078
North stockpile	J03JV9	7/7/05	--		--	0.11	U	0.11	--		--	0.11	U	0.11
North stockpile	J03N93	7/7/05	--		--	0.25	U	0.25	--		--	0.1	U	0.1
North stockpile	J03N94	7/7/05	--		--	0.25	U	0.25	--		--	0.073	U	0.073
North stockpile	J03N95	7/7/05	--		--	0.33	U	0.33	--		--	0.082	U	0.082
North stockpile	J03N96	7/7/05	--		--	0.1	U	0.1	--		--	0.1	U	0.1
North stockpile	J03N97	7/7/05	--		--	0.23	U	0.23	--		--	0.086	U	0.086
North stockpile	J03N99	7/7/05	--		--	0.29	U	0.29	--		--	0.081	U	0.081
North stockpile	J03NB3	7/11/05	--		--	0.21	U	0.21	--		--	0.088	U	0.088
North hot spot	J03NT6	7/20/05	-2.07	U	2.09	0.825	U	0.797	--		--	50.8		0.517
North hot spot	J03NV7	7/21/05	-2.57	U	2.71	0.951	U	1.21	--		--	105		0.768

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Sample Location	Sample Number	Sample Date	Nickel-63			Potassium-40			Radium-226			Radium-228		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Stockpile	J02MN5	3/7/05	-0.427	U	3.4	16.2		0.34	0.623		0.08	0.965		0.16
South loadout	J032Y0	4/21/05	--		--	7.54		0.32	0.353		0.068	0.4		0.18
South loadout	J032Y1	4/21/05	--		--	8.53		0.3	0.325		0.064	0.54		0.13
South loadout	J032Y2	4/21/05	--		--	0.77	U	0.77	0.089	U	0.089	0.18	U	0.18
North BCL	J032Y5	5/23/05	--		--	12		2.03	1.17		1.83	--		--
North BCL	J032Y7	5/23/05	--		--	13.8		2.46	2.07	U	2.81	--		--
North BCL	J032Y8	5/23/05	--		--	12.8		1.33	1.12	U	2.3	--		--
Equip. Blank	J032Y9	5/23/05	--		--	4.18		0.7	0.228		0.15	0.52	U	0.52
North BCL	J03300	5/23/05	--		--	7.89		0.66	0.328		0.13	0.573		0.24
Dup of J03300	J03301	5/23/05	--		--	8.65		0.73	0.323		0.13	0.502		0.29
North BCL	J03302	5/23/05	--		--	8.43		1.3	0.452		0.17	0.551		0.35
North BCL	J03303	5/23/05	--		--	9.31		0.71	0.382		0.13	0.58		0.3
North BCL	J036V5	5/23/05	--		--	10.4		0.331	0.691	U	2.5	--		--
North BCL	J036V7	5/23/05	--		--	6.19		1.1	0.472		0.17	0.41	U	0.41
North BCL	J036V8	5/23/05	--		--	8.98		0.93	0.309		0.17	0.599		0.41
North BCL	J036V9	5/23/05	--		--	8.07		0.75	0.331		0.15	0.558		0.27
North BCL	J036W2	5/26/05	--		--	8.06		0.29	0.304		0.049	0.477		0.11
North BCL	J036W3	5/25/05	--		--	8.82		0.24	0.308		0.037	0.545		0.083
North BCL	J036W4	6/1/05	--		--	14.3		0.87	0.667		0.18	1.12		0.32
North BCL	J036W5	6/1/05	--		--	13.8		1.1	0.643		0.14	0.927		0.41
North loadout	J03D21	6/22/05	--		--	4.09		0.82	0.235		0.12	0.39	U	0.39
North loadout	J03D22	6/22/05	--		--	8.84		0.96	0.468		0.19	0.77	U	0.77
North loadout	J03D23	6/22/05	--		--	6.93		1	0.236		0.16	0.47	U	0.47
BCL stockpile	J03JN2	6/29/05	--		--	4.9		0.48	0.278		0.087	0.39	U	0.39
BCL stockpile	J03JN3	6/29/05	--		--	5.66		0.56	0.351		0.11	0.28	U	0.28
BCL stockpile	J03JN4	6/29/05	--		--	10.8		1.1	0.45		0.16	0.826		0.37
BCL stockpile	J03JN5	6/29/05	--		--	9.94		0.76	0.358		0.16	0.75	U	0.75
South loadout	J03JT6	6/30/05	--		--	7.42		0.59	0.323		0.11	0.58	U	0.58
BCL stockpile	J03JV0	7/1/05	--		--	10.3		0.72	0.55		0.19	0.636		0.44
BCL stockpile	J03JV1	7/1/05	--		--	5.3		0.52	0.323		0.091	0.3	U	0.3
BCL stockpile	J03JV3	7/1/05	--		--	8.28		0.86	0.359		0.14	0.769		0.28
BCL stockpile	J03JV5	7/1/05	--		--	10.4		0.7	0.346		0.14	0.693		0.27
BCL stockpile	J03JV6	7/1/05	--		--	6.15		0.63	0.181		0.12	0.31	U	0.31
North stockpile	J03JV7	7/7/05	--		--	6.58		0.51	0.43		0.11	0.36	U	0.36
North stockpile	J03JV8	7/7/05	--		--	13		0.57	0.556		0.15	1.04		0.31
North stockpile	J03JV9	7/7/05	--		--	10.2		1.1	0.349		0.19	0.853		0.51
North stockpile	J03N93	7/7/05	--		--	10.6		0.97	0.319		0.22	0.92		0.49
North stockpile	J03N94	7/7/05	--		--	6.57		0.65	0.16	U	0.16	0.37	U	0.37
North stockpile	J03N95	7/7/05	--		--	13.2		0.11	0.48		0.16	0.685		0.4
North stockpile	J03N96	7/7/05	--		--	8.63		1.2	0.411		0.17	0.724		0.44
North stockpile	J03N97	7/7/05	--		--	11.3		0.61	0.611		0.18	0.888		0.39
North stockpile	J03N99	7/7/05	--		--	10.9		0.75	0.412		0.15	0.875		0.34
North stockpile	J03NB3	7/11/05	--		--	9.98		0.92	0.435		0.15	0.659		0.35
North hot spot	J03NT6	7/20/05	--		--	15		1.45	6.28	U	6.53	--		--
North hot spot	J03NV7	7/21/05	--		--	12.3		1.74	0.548	U	8.06	--		--

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Sample Location	Sample Number	Sample Date	Cobalt-60			Europium-152			Europium-154			Europium-155		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Stockpile	J02MN5	3/7/05	0.047	U	0.047	0.093	U	0.093	0.15	U	0.15	0.13	U	0.13
South loadout	J032Y0	4/21/05	0.038	U	0.038	0.089	U	0.089	0.11	U	0.11	0.088	U	0.088
South loadout	J032Y1	4/21/05	0.032	U	0.032	0.076	U	0.076	0.12	U	0.12	0.078	U	0.078
South loadout	J032Y2	4/21/05	0.049	U	0.049	0.13	U	0.13	0.18	U	0.18	0.1	U	0.1
North BCL	J032Y5	5/23/05	0.0641	U	0.265	0.112	U	0.178	-0.0239	U	0.124	0.0417	U	0.2
North BCL	J032Y7	5/23/05	0.296	U	0.285	-0.0246	U	0.201	0.0266	U	0.144	-0.0221	U	0.226
North BCL	J032Y8	5/23/05	0.0171	U	0.251	0.0877	U	0.18	-0.0944	U	0.12	-0.0828	U	0.197
Equip. Blank	J032Y9	5/23/05	0.099	U	0.099	0.18	U	0.18	0.27	U	0.27	0.17	U	0.17
North BCL	J03300	5/23/05	0.064	U	0.064	0.15	U	0.15	0.22	U	0.22	0.17	U	0.17
Dup of J03300	J03301	5/23/05	0.099	U	0.099	0.26	U	0.26	0.32	U	0.32	0.16	U	0.16
North BCL	J03302	5/23/05	0.11	U	0.11	0.23	U	0.23	0.28	U	0.28	0.2	U	0.2
North BCL	J03303	5/23/05	0.084	U	0.084	0.16	U	0.16	0.24	U	0.24	0.16	U	0.16
North BCL	J036V5	5/23/05	0.0801	U	0.265	0.00216	U	0.199	-0.11	U	0.138	-0.082	U	0.212
North BCL	J036V7	5/23/05	0.099	U	0.099	0.26	U	0.26	0.28	U	0.28	0.15	U	0.15
North BCL	J036V8	5/23/05	0.087	U	0.087	0.2	U	0.2	0.32	U	0.32	0.19	U	0.19
North BCL	J036V9	5/23/05	0.074	U	0.074	0.17	U	0.17	0.24	U	0.24	0.17	U	0.17
North BCL	J036W2	5/26/05	0.026	U	0.026	0.057	U	0.057	0.08	U	0.08	0.054	U	0.054
North BCL	J036W3	5/25/05	0.022	U	0.022	0.051	U	0.051	0.068	U	0.068	0.053	U	0.053
North BCL	J036W4	6/1/05	0.082	U	0.082	0.18	U	0.18	0.25	U	0.25	0.21	U	0.21
North BCL	J036W5	6/1/05	0.14	U	0.14	0.25	U	0.25	0.34	U	0.34	0.23	U	0.23
North loadout	J03D21	6/22/05	0.1	U	0.1	0.27	U	0.27	0.32	U	0.32	0.15	U	0.15
North loadout	J03D22	6/22/05	0.11	U	0.11	0.25	U	0.25	0.33	U	0.33	0.3	U	0.3
North loadout	J03D23	6/22/05	0.11	U	0.11	0.3	U	0.3	0.34	U	0.34	0.18	U	0.18
BCL stockpile	J03JN2	6/29/05	0.046	U	0.046	0.16	U	0.16	0.16	U	0.16	0.15	U	0.15
BCL stockpile	J03JN3	6/29/05	0.065	U	0.065	0.19	U	0.19	0.2	U	0.2	0.17	U	0.17
BCL stockpile	J03JN4	6/29/05	0.11	U	0.11	0.21	U	0.21	0.31	U	0.31	0.21	U	0.21
BCL stockpile	J03JN5	6/29/05	0.12	U	0.12	0.31	U	0.31	0.35	U	0.35	0.18	U	0.18
South loadout	J03JT6	6/30/05	0.067	U	0.067	0.14	U	0.14	0.21	U	0.21	0.14	U	0.14
BCL stockpile	J03JV0	7/1/05	0.1	U	0.1	0.21	U	0.21	0.37	U	0.37	0.21	U	0.21
BCL stockpile	J03JV1	7/1/05	0.059	U	0.059	0.2	U	0.2	0.19	U	0.19	0.18	U	0.18
BCL stockpile	J03JV3	7/1/05	0.097	U	0.097	0.2	U	0.2	0.22	U	0.22	0.28	U	0.28
BCL stockpile	J03JV5	7/1/05	0.074	U	0.074	0.17	U	0.17	0.23	U	0.23	0.18	U	0.18
BCL stockpile	J03JV6	7/1/05	0.07	U	0.07	0.22	U	0.22	0.21	U	0.21	0.2	U	0.2
North stockpile	J03JV7	7/7/05	0.069	U	0.069	0.26	U	0.26	0.27	U	0.27	0.23	U	0.23
North stockpile	J03JV8	7/7/05	0.088	U	0.088	0.18	U	0.18	0.22	U	0.22	0.2	U	0.2
North stockpile	J03JV9	7/7/05	0.12	U	0.12	0.31	U	0.31	0.41	U	0.41	0.18	U	0.18
North stockpile	J03N93	7/7/05	0.11	U	0.11	0.21	U	0.21	0.35	U	0.35	0.23	U	0.23
North stockpile	J03N94	7/7/05	0.077	U	0.077	0.25	U	0.25	0.24	U	0.24	0.22	U	0.22
North stockpile	J03N95	7/7/05	0.076	U	0.076	0.2	U	0.2	0.33	U	0.33	0.21	U	0.21
North stockpile	J03N96	7/7/05	0.11	U	0.11	0.3	U	0.3	0.35	U	0.35	0.19	U	0.19
North stockpile	J03N97	7/7/05	0.12	U	0.12	0.22	U	0.22	0.32	U	0.32	0.21	U	0.21
North stockpile	J03N99	7/7/05	0.072	U	0.072	0.16	U	0.16	0.27	U	0.27	0.19	U	0.19
North stockpile	J03NB3	7/11/05	0.13	U	0.13	0.19	U	0.19	0.32	U	0.32	0.2	U	0.2
North hot spot	J03NT6	7/20/05	6.34		0.22	60		1.02	-1.81	U	1.13	1.79	U	0.845
North hot spot	J03NV7	7/21/05	10.2		0.307	87.1		1.34	-2.36	U	1.3	1.65	U	1

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Sample Location	Sample Number	Sample Date	Silver-108			Thorium-228			Thorium-232			Thorium-234		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Stockpile	J02MN5	3/7/05	--		--	0.977		0.074	0.965		0.16	--		--
South loadout	J032Y0	4/21/05	--		--	0.425		0.039	0.4		0.18	--		--
South loadout	J032Y1	4/21/05	--		--	0.442		0.034	0.54		0.13	--		--
South loadout	J032Y2	4/21/05	--		--	0.063	U	0.063	0.18	U	0.18	--		--
North BCL	J032Y5	5/23/05	-0.0128	U	0.11	--		--	--		--	1.42	U	1.025
North BCL	J032Y7	5/23/05	0.0182	U	0.115	--		--	--		--	1.04	U	1.39
North BCL	J032Y8	5/23/05	-0.0279	U	0.121	--		--	--		--	0.407	U	0.915
Equip. Blank	J032Y9	5/23/05	--		--	0.158		0.1	0.52	U	0.52	--		--
North BCL	J03300	5/23/05	--		--	0.46		0.099	0.573		0.24	--		--
Dup of J03300	J03301	5/23/05	--		--	0.509		0.11	0.502		0.29	--		--
North BCL	J03302	5/23/05	--		--	0.504		0.14	0.551		0.35	--		--
North BCL	J03303	5/23/05	--		--	0.527		0.12	0.58		0.3	--		--
North BCL	J036V5	5/23/05	-0.0646	U	0.137	--		--	--		--	0.9	U	1.35
North BCL	J036V7	5/23/05	--		--	0.524		0.1	0.41	U	0.41	--		--
North BCL	J036V8	5/23/05	--		--	0.43		0.097	0.599		0.41	--		--
North BCL	J036V9	5/23/05	--		--	0.426		0.12	0.558		0.27	--		--
North BCL	J036W2	5/26/05	--		--	0.403		0.026	0.477		0.11	--		--
North BCL	J036W3	5/25/05	--		--	0.533		0.038	0.545		0.083	--		--
North BCL	J036W4	6/1/05	--		--	0.816		0.094	1.12		0.32	--		--
North BCL	J036W5	6/1/05	--		--	0.699		0.12	0.927		0.41	--		--
North loadout	J03D21	6/22/05	--		--	0.439		0.1	0.39	U	0.39	--		--
North loadout	J03D22	6/22/05	--		--	0.393		0.18	0.77	U	0.77	--		--
North loadout	J03D23	6/22/05	--		--	0.433		0.11	0.47	U	0.47	--		--
BCL stockpile	J03JN2	6/29/05	--		--	0.512		0.09	0.39	U	0.39	--		--
BCL stockpile	J03JN3	6/29/05	--		--	0.501		0.09	0.28	U	0.28	--		--
BCL stockpile	J03JN4	6/29/05	--		--	0.56		0.092	0.826		0.37	--		--
BCL stockpile	J03JN5	6/29/05	--		--	0.678		0.13	0.75	U	0.75	--		--
South loadout	J03JT6	6/30/05	--		--	0.483		0.098	0.58	U	0.58	--		--
BCL stockpile	J03JV0	7/1/05	--		--	0.632		0.16	0.636		0.44	--		--
BCL stockpile	J03JV1	7/1/05	--		--	0.5		0.11	0.3	U	0.3	--		--
BCL stockpile	J03JV3	7/1/05	--		--	0.441		0.093	0.769		0.28	--		--
BCL stockpile	J03JV5	7/1/05	--		--	0.522		0.074	0.693		0.27	--		--
BCL stockpile	J03JV6	7/1/05	--		--	0.478		0.12	0.31	U	0.31	--		--
North stockpile	J03JV7	7/7/05	--		--	0.878		0.13	0.36	U	0.36	--		--
North stockpile	J03JV8	7/7/05	--		--	0.676		0.082	1.04		0.31	--		--
North stockpile	J03JV9	7/7/05	--		--	0.854		0.12	0.853		0.51	--		--
North stockpile	J03N93	7/7/05	--		--	0.612		0.11	0.92		0.49	--		--
North stockpile	J03N94	7/7/05	--		--	0.581		0.11	0.37	U	0.37	--		--
North stockpile	J03N95	7/7/05	--		--	0.746		0.15	0.685		0.4	--		--
North stockpile	J03N96	7/7/05	--		--	0.681		0.12	0.724		0.44	--		--
North stockpile	J03N97	7/7/05	--		--	0.579		0.11	0.888		0.39	--		--
North stockpile	J03N99	7/7/05	--		--	0.609		0.079	0.875		0.34	--		--
North stockpile	J03NB3	7/11/05	--		--	0.535		0.1	0.659		0.35	--		--
North hot spot	J03NT6	7/20/05	0.416		0.252	--		--	--		--	3.31	U	4.94
North hot spot	J03NV7	7/21/05	0.0161	U	0.445	--		--	--		--	-5.56	U	6.01

Sample Location	HEIS Number	Sample Date	Total beta radiostrontium			Tritium		
			pCi/g	Q	MDA	pCi/g	Q	MDA
Stockpile	J02MN5	3/7/05	0.066	U	0.28	0.912	U	3.5

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Sample Location	Sample Number	Sample Date	Uranium-235			Uranium-238		
			pCi/g	Q	MDA	pCi/g	Q	MDA
Stockpile	J02MN5	3/7/05	0.19	U	0.19	4.9	U	4.9
South loadout	J032Y0	4/21/05	0.13	U	0.13	5.1	U	5.1
South loadout	J032Y1	4/21/05	0.13	U	0.13	4	U	4
South loadout	J032Y2	4/21/05	0.16	U	0.16	5.6	U	5.6
North BCL	J032Y5	5/23/05	0.0215	U	0.113	--		--
North BCL	J032Y7	5/23/05	0.0387	U	0.174	--		--
North BCL	J032Y8	5/23/05	-0.0456	U	0.142	--		--
Equip. Blank	J032Y9	5/23/05	0.22	U	0.22	8.8	U	8.8
North BCL	J03300	5/23/05	0.24	U	0.24	7.5	U	7.5
Dup of J03300	J03301	5/23/05	0.29	U	0.29	11	U	11
North BCL	J03302	5/23/05	0.29	U	0.29	11	U	11
North BCL	J03303	5/23/05	0.26	U	0.26	9.2	U	9.2
North BCL	J036V5	5/23/05	-0.129	U	0.154	--		--
North BCL	J036V7	5/23/05	0.27	U	0.27	12	U	12
North BCL	J036V8	5/23/05	0.29	U	0.29	11	U	11
North BCL	J036V9	5/23/05	0.27	U	0.27	8.4	U	8.4
North BCL	J036W2	5/26/05	0.09	U	0.09	3.1	U	3.1
North BCL	J036W3	5/25/05	0.084	U	0.084	2.5	U	2.5
North BCL	J036W4	6/1/05	0.32	U	0.32	9.8	U	9.8
North BCL	J036W5	6/1/05	0.35	U	0.35	14	U	14
North loadout	J03D21	6/22/05	0.26	U	0.26	11	U	11
North loadout	J03D22	6/22/05	0.44	U	0.44	14	U	14
North loadout	J03D23	6/22/05	0.31	U	0.31	12	U	12
BCL stockpile	J03JN2	6/29/05	0.24	U	0.24	5.8	U	5.8
BCL stockpile	J03JN3	6/29/05	0.26	U	0.26	7.4	U	7.4
BCL stockpile	J03JN4	6/29/05	0.32	U	0.32	11	U	11
BCL stockpile	J03JN5	6/29/05	0.31	U	0.31	13	U	13
South loadout	J03JT6	6/30/05	0.19	U	0.19	6.9	U	6.9
BCL stockpile	J03JV0	7/1/05	0.33	U	0.33	11	U	11
BCL stockpile	J03JV1	7/1/05	0.27	U	0.27	7.2	U	7.2
BCL stockpile	J03JV3	7/1/05	0.3	U	0.3	9.1	U	9.1
BCL stockpile	J03JV5	7/1/05	0.26	U	0.26	7.6	U	7.6
BCL stockpile	J03JV6	7/1/05	0.3	U	0.3	7.4	U	7.4
North stockpile	J03JV7	7/7/05	0.33	U	0.33	9	U	9
North stockpile	J03JV8	7/7/05	0.33	U	0.33	11	U	11
North stockpile	J03JV9	7/7/05	0.33	U	0.33	13	U	13
North stockpile	J03N93	7/7/05	0.35	U	0.35	13	U	13
North stockpile	J03N94	7/7/05	0.32	U	0.32	8.9	U	8.9
North stockpile	J03N95	7/7/05	0.31	U	0.31	9.7	U	9.7
North stockpile	J03N96	7/7/05	0.31	U	0.31	12	U	12
North stockpile	J03N97	7/7/05	0.31	U	0.31	10	U	10
North stockpile	J03N99	7/7/05	0.29	U	0.29	9.4	U	9.4
North stockpile	J03NB3	7/11/05	0.31	U	0.31	13	U	13
North hot spot	J03NT6	7/20/05	-1.66	U	0.404	--		--
North hot spot	J03NV7	7/21/05	-0.247	U	0.499	--		--

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Sample Location	Sample Number	Sample Date	Aluminum			Antimony			Arsenic			Barium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
South of River	J02MN2	3/7/05	49.8		1.00	0.21	U	0.21	0.27	U	0.27	1.4	C	0.02
South of River	J02MN3	3/7/05	9050		6.09	1.1	U	1.1	4.5		2.43	100	C	0.12
South of River	J02MN4	3/7/05	8860		6.09	1.3	U	1.3	5.1		2.43	100	C	0.12
South of River	J02MN6	3/7/05	--		--	--		--	5.5		1.00	111	C	0.02
South loadout	J032Y0	4/21/05	3040		1.07	0.13	U	0.13	1.8		0.43	32.7	C	0.02
South loadout	J032Y1	4/21/05	2880		1.07	0.143	U	0.143	1.7		0.43	31	C	0.02
South loadout	J032Y2	4/21/05	3520		1.06	0.192	U	0.192	2.1		0.42	37.7	C	0.02
Equip. Blank	J032Y9	5/23/05	65.2		1.00	0.33	U	0.33	0.37	U	0.37	1.2	C	0.02
North BCL	J03300	5/23/05	5890		6.15	1.9	U	1.9	2.2		2.46	55.9	C	0.12
Dup of J03300	J03301	5/23/05	5630		6.15	2.1	U	2.1	2.7		2.46	64.3	C	0.12
North BCL	J03302	5/23/05	6180		6.13	2.4	U	2.4	2.7	U	2.70	62.5	C	0.12
North BCL	J03303	5/23/05	5790		6.09	1.8	U	1.8	2	U	2.00	53	C	0.12
North BCL	J036V7	5/23/05	6190		6.13	2.1	U	2.1	2.4	U	2.40	60.7	C	0.12
North BCL	J036V8	5/23/05	5790		6.12	2.4	U	2.4	2.6	U	2.60	59.9	C	0.12
North BCL	J036V9	5/23/05	6270		6.17	2.3	U	2.3	2.5	U	2.50	56	C	0.12
North BCL	J036W2	5/26/05	6090		6.67	1.9	U	1.9	2.1	U	2.10	63.2	C	0.13
North BCL	J036W3	5/25/05	6260		6.32	2.2	U	2.2	2.4	U	2.40	65.7	C	0.13
North BCL	J036W4	6/1/05	8020		1.03	2.3	U	2.3	4.7		2.47	86.1	C	0.12
North BCL	J036W5	6/1/05	8140		1.02	2.3	U	2.3	4		2.45	82.4	C	0.12
Dogleg	J037M9	6/7/05	9410	C	1.00	0.946	U	0.946	5.3		1.20	154	C	0.06
Dogleg	J037N0	6/7/05	9140	C	1.00	0.946	U	0.946	5.2		1.20	134	C	0.06
North loadout	J03D21	6/22/05	3730		1.06	2.1	U	2.1	2.4	U	2.40	47.7	C	0.13
North loadout	J03D22	6/22/05	3260		1.06	2.2	U	2.2	2.5	U	2.50	42.6	C	0.13
North loadout	J03D23	6/22/05	3720		1.06	2.1	U	2.1	2.4	U	2.40	46	C	0.13
BCL stockpile	J03JN2	6/29/05	4800		1.00	2.1	U	2.1	2.4	U	2.40	70.3	C	0.12
BCL stockpile	J03JN3	6/29/05	5790		1.00	2.1	U	2.1	2.3	U	2.30	77	C	0.12
BCL stockpile	J03JN4	6/29/05	6160		1.00	2.1	U	2.1	2.5		2.40	74.4	C	0.12
BCL stockpile	J03JN5	6/29/05	4980		1.00	2.1	U	2.1	3		2.41	88.1	C	0.12
South loadout	J03JT6	6/30/05	4260		1.05	2.4	U	2.4	2.7	U	2.70	45.8	C	0.13
BCL stockpile	J03JV0	7/1/05	7640		1.01	2.2	U	2.2	3.1		2.42	80.2	C	0.12
BCL stockpile	J03JV1	7/1/05	7260		1.01	2.3	U	2.3	3.9		2.41	68.8	C	0.12
BCL stockpile	J03JV3	7/1/05	5790		1.00	2.3	U	2.3	4.1		2.40	61.1	C	0.12
BCL stockpile	J03JV5	7/1/05	4750		1.00	2.2	U	2.2	4.3		2.40	56.8	C	0.12
BCL stockpile	J03JV6	7/1/05	5240		1.00	2.2	U	2.2	3		2.40	85.2	C	0.12
North stockpile	J03JV7	7/7/05	7480		1.00	2.2	U	2.2	2.9		2.41	76.2	C	0.12
North stockpile	J03JV8	7/7/05	8430		1.01	2.2	U	2.2	6.2		2.41	94.9	C	0.12
North stockpile	J03JV9	7/7/05	8020		1.01	2.2	U	2.2	6.4		2.41	103	C	0.12
North stockpile	J03N93	7/7/05	8200		1.00	2.2	U	2.2	4.7		2.41	90.3	C	0.12
North stockpile	J03N94	7/7/05	7530		1.01	2.2	U	2.2	5.6		2.41	90.7	C	0.12
North stockpile	J03N95	7/7/05	7230		1.00	2.2	U	2.2	4.4		2.41	86	C	0.12
North stockpile	J03N96	7/7/05	7150		1.01	2.2	U	2.2	4		2.41	87.1	C	0.12
North stockpile	J03N97	7/7/05	7540		1.01	2.2	U	2.2	3.7		2.41	83.5	C	0.12
North stockpile	J03N99	7/7/05	6470		1.01	2.2	U	2.2	4.5		2.41	73.2	C	0.12
North stockpile	J03NB3	7/11/05	5220		1.00	2.2	U	2.2	2.9		2.40	91	C	0.12
Dogleg	J03NL5	7/14/05	5140		1.06	2.39	U	2.39	3		2.56	70.8	C	0.13
Office trailers	J11VH3	3/30/06	--		--	--		--	1.7		0.43	50.5	C	0.02

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Sample Location	Sample Number	Sample Date	Beryllium			Boron			Cadmium			Calcium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
South of River	J02MN2	3/7/05	0.02		0.01	0.38		0.20	0.04	U	0.04	20.4	C	2.50
South of River	J02MN3	3/7/05	0.71		0.06	1.8		1.22	0.2	U	0.20	5560	C	15.21
South of River	J02MN4	3/7/05	0.7		0.06	1.5		1.22	0.23	U	0.23	5400	C	15.21
South of River	J02MN6	3/7/05	--		--	--		--	0.022	U	0.02	--		--
South loadout	J032Y0	4/21/05	0.221		0.01	0.763		0.21	0.06		0.03	6490		2.69
South loadout	J032Y1	4/21/05	0.215		0.01	0.791		0.21	0.057		0.03	5780		2.68
South loadout	J032Y2	4/21/05	0.263		0.01	0.666		0.21	0.056		0.03	6140		2.64
Equip. Blank	J032Y9	5/23/05	0.02		0.01	1.1	UC	1.10	0.02	U	0.02	27.3	C	2.50
North BCL	J03300	5/23/05	0.15		0.06	1.2	C	1.23	0.14	U	0.14	5700	C	15.38
Dup of J03300	J03301	5/23/05	0.06		0.06	1.9	C	1.23	0.16	U	0.16	5550	C	15.38
North BCL	J03302	5/23/05	0.12		0.06	1.4	UC	1.40	0.18	U	0.18	5940	C	15.32
North BCL	J03303	5/23/05	0.43		0.06	1	UC	1.00	0.42		0.18	5670	C	15.23
North BCL	J036V7	5/23/05	0.1		0.06	1.2	UC	1.20	0.16	U	0.16	5760	C	15.34
North BCL	J036V8	5/23/05	0.14		0.06	1.4	UC	1.40	0.18	U	0.18	5720	C	15.31
North BCL	J036V9	5/23/05	0.15		0.06	1.3	UC	1.30	0.17	U	0.17	5600	C	15.42
North BCL	J036W2	5/26/05	0.07		0.06	3.4	C	1.33	0.14	U	0.14	6210	C	16.67
North BCL	J036W3	5/25/05	0.06		0.06	2.1	C	1.30	0.16	U	0.16	5980	C	15.79
North BCL	J036W4	6/1/05	0.79		0.06	8.4	C	1.23	0.18		0.19	13600	C	15.43
North BCL	J036W5	6/1/05	0.85		0.06	3.4	C	1.23	0.17	U	0.17	4550	C	15.32
Dogleg	J037M9	6/7/05	0.622		0.03	10.8	C	0.60	0.091		0.09	13700	C	7.51
Dogleg	J037N0	6/7/05	0.598		0.03	8.5	C	0.60	0.091		0.09	13100	C	7.51
North loadout	J03D21	6/22/05	0.21		0.06	2	C	1.27	1.2		0.19	13600		2.65
North loadout	J03D22	6/22/05	0.05	U	0.05	1.3	UC	1.30	1		1.02	12800		2.65
North loadout	J03D23	6/22/05	0.11		0.06	1.2	UC	1.20	1.3		0.19	5550		2.65
BCL stockpile	J03JN2	6/29/05	0.05	U	0.05	1.2	UC	1.20	1.4		0.18	5040		2.51
BCL stockpile	J03JN3	6/29/05	0.07		0.06	1.2	UC	1.20	1.3		0.18	4130		2.51
BCL stockpile	J03JN4	6/29/05	0.09		0.06	1.2	UC	1.20	1.6		0.18	3970		2.50
BCL stockpile	J03JN5	6/29/05	0.05	U	0.05	1.2	UC	1.20	1.3		0.18	4600		2.51
South loadout	J03JT6	6/30/05	0.71		0.06	8.3	C	1.26	0.2		0.19	6550	C	2.63
BCL stockpile	J03JV0	7/1/05	0.82		0.06	1.4	C	1.21	0.17	U	0.17	6980	C	2.52
BCL stockpile	J03JV1	7/1/05	0.93		0.06	2.4	C	1.21	0.17	U	0.17	6450	C	2.51
BCL stockpile	J03JV3	7/1/05	0.92		0.06	1.3	UC	1.30	0.17	U	0.17	5240	C	2.51
BCL stockpile	J03JV5	7/1/05	0.86		0.06	1.3	UC	1.30	0.17	U	0.17	4970	C	2.50
BCL stockpile	J03JV6	7/1/05	0.67		0.06	1.3	UC	1.30	0.17	U	0.17	4260	C	2.51
North stockpile	J03JV7	7/7/05	0.31		0.06	6.7		1.20	0.17	U	0.17	4160	C	15.06
North stockpile	J03JV8	7/7/05	0.4		0.06	2.4		1.21	0.17	U	0.17	5700	C	15.08
North stockpile	J03JV9	7/7/05	0.42		0.06	1.3	U	1.30	0.16	U	0.16	5580	C	15.08
North stockpile	J03N93	7/7/05	0.4		0.06	1.3	U	1.30	0.17	U	0.17	5940	C	15.05
North stockpile	J03N94	7/7/05	0.38		0.06	1.3	U	1.30	0.17	U	0.17	4540	C	15.08
North stockpile	J03N95	7/7/05	0.36		0.06	1.3	U	1.30	0.17	U	0.17	4550	C	15.06
North stockpile	J03N96	7/7/05	0.36		0.06	1.3	U	1.30	0.17	U	0.17	5380	C	15.08
North stockpile	J03N97	7/7/05	0.37		0.06	1.3	U	1.30	0.17	U	0.17	4790	C	15.08
North stockpile	J03N99	7/7/05	0.32		0.06	1.3	U	1.30	0.16	U	0.16	4920	C	15.08
North stockpile	J03NB3	7/11/05	0.28		0.06	2.6		1.20	0.16	U	0.16	5200	C	15.03
Dogleg	J03NL5	7/14/05	0.525		0.06	1.37	U	1.37	0.179	U	0.18	4750	C	2.66
Office trailers	J11VH3	3/30/06	--		--	--		--	0.07	U	0.07	--		--

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Sample Location	Sample Number	Sample Date	Chromium			Cobalt			Copper			Hexavalent Chromium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
South of River	J02MN2	3/7/05	0.1	C	0.03	0.07		0.07	0.2	C	0.05	0.2	U	0.2
South of River	J02MN3	3/7/05	15.9	C	0.18	9		0.43	20.3	C	0.30	0.2	U	0.2
South of River	J02MN4	3/7/05	15	C	0.18	8.1		0.43	20.3	C	0.30	0.22		0.25
South of River	J02MN6	3/7/05	17.5		0.03	--		--	--		--	0.35	U	0.35
South loadout	J032Y0	4/21/05	3.2	C	0.03	5.1		0.08	12.8		0.05	--		--
South loadout	J032Y1	4/21/05	3.1	C	0.03	5.5		0.08	11.5		0.05	--		--
South loadout	J032Y2	4/21/05	3.8	C	0.03	6.5		0.07	14.2		0.05	--		--
Equip. Blank	J032Y9	5/23/05	0.12		0.03	0.07	U	0.07	0.15		0.05	--		--
North BCL	J03300	5/23/05	7.6		0.18	10.3		0.43	16.8		0.31	--		--
Dup of J03300	J03301	5/23/05	6.8		0.18	9.3		0.43	16.8		0.31	--		--
North BCL	J03302	5/23/05	7.7		0.18	9.9		0.43	18.4		0.31	--		--
North BCL	J03303	5/23/05	7.6		0.18	9.7		0.43	21.7		0.30	--		--
North BCL	J036V7	5/23/05	7.5		0.18	10		0.43	18.3		0.31	--		--
North BCL	J036V8	5/23/05	8.2		0.18	10.1		0.43	18.8		0.31	--		--
North BCL	J036V9	5/23/05	11.3		0.18	9		0.43	19.6		0.31	--		--
North BCL	J036W2	5/26/05	7.8		0.18	9.7		0.47	16.7		0.33	--		--
North BCL	J036W3	5/25/05	6.8		0.19	10.2		0.44	16.8		0.32	--		--
North BCL	J036W4	6/1/05	16.1		0.19	8.1		0.43	17.5		0.31	--		--
North BCL	J036W5	6/1/05	13.3		0.18	8.1		0.43	15.4		0.31	--		--
Dogleg	J037M9	6/7/05	19.1	C	0.09	7.5		0.21	18		0.15	--		--
Dogleg	J037N0	6/7/05	19.2	C	0.09	7.2		0.21	16.4		0.15	--		--
North loadout	J03D21	6/22/05	2.5	C	0.19	6.2		0.45	14.7		0.05	--		--
North loadout	J03D22	6/22/05	3	C	0.19	5.6		0.44	12.5		0.05	--		--
North loadout	J03D23	6/22/05	5.8	C	0.19	6.7		0.45	16.5		0.05	--		--
BCL stockpile	J03JN2	6/29/05	5.7	C	0.18	8.1		0.42	15.8		0.05	--		--
BCL stockpile	J03JN3	6/29/05	9.7	C	0.18	7.6		0.42	14.8		0.05	--		--
BCL stockpile	J03JN4	6/29/05	10.5	C	0.18	7.3		0.42	14.7		0.05	--		--
BCL stockpile	J03JN5	6/29/05	7.6	C	0.18	7.5		0.42	13.7		0.05	--		--
South loadout	J03JT6	6/30/05	8.3	C	0.19	7.6		0.44	18.8		0.05	--		--
BCL stockpile	J03JV0	7/1/05	13.3	C	0.18	8.7		0.42	17.5		0.05	--		--
BCL stockpile	J03JV1	7/1/05	11.1	C	0.18	8		0.42	18.1		0.05	--		--
BCL stockpile	J03JV3	7/1/05	9.6	C	0.18	8		0.42	15.4		0.05	--		--
BCL stockpile	J03JV5	7/1/05	8.3	C	0.18	7.4		0.42	14.2		0.05	--		--
BCL stockpile	J03JV6	7/1/05	9.9	C	0.18	5.5		0.42	14.8		0.05	--		--
North stockpile	J03JV7	7/7/05	14.5		0.18	6.8		0.42	16.1		0.30	--		--
North stockpile	J03JV8	7/7/05	14.4		0.18	8.5		0.42	20.5		0.30	--		--
North stockpile	J03JV9	7/7/05	13.3		0.18	8.4		0.42	20.4		0.30	--		--
North stockpile	J03N93	7/7/05	12.9		0.18	9		0.42	20.8		0.30	--		--
North stockpile	J03N94	7/7/05	14.1		0.18	7.4		0.42	19.1		0.30	--		--
North stockpile	J03N95	7/7/05	17.2		0.18	7.2		0.42	18.7		0.30	--		--
North stockpile	J03N96	7/7/05	11.8		0.18	7.2		0.42	18.2		0.30	--		--
North stockpile	J03N97	7/7/05	12.3		0.18	7.3		0.42	17.6		0.30	--		--
North stockpile	J03N99	7/7/05	10.3		0.18	7.4		0.42	15.8		0.30	--		--
North stockpile	J03NB3	7/11/05	7.7		0.18	6.5		0.42	14.1		0.30	--		--
Dogleg	J03NL5	7/14/05	6		0.19	7.4		0.45	17.9		0.32	0.213	U	0.213
Office trailers	J11VH3	3/30/06	3		0.03	--		--	--		--	0.21	U	0.21

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Sample Location	Sample Number	Sample Date	Iron			Lead			Lithium			Magnesium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
South of River	J02MN2	3/7/05	117	C	1.00	0.2		0.20	0.06	C	0.01	7	C	4.00
South of River	J02MN3	3/7/05	22200	C	6.09	6.1		1.22	10.2	C	0.06	5900	C	24.34
South of River	J02MN4	3/7/05	20300	C	6.09	6.4		1.22	10.2	C	0.06	5480	C	24.34
South of River	J02MN6	3/7/05	--		--	6.3		0.20	--		--	--		--
South loadout	J032Y0	4/21/05	13900	C	1.07	3.5		0.21	3.5	C	0.01	2730		4.30
South loadout	J032Y1	4/21/05	13100	C	1.07	2.4		0.21	3.1	C	0.01	2500		4.29
South loadout	J032Y2	4/21/05	16400	C	1.06	3.1		0.21	3.6	C	0.01	3270		4.23
Equip. Blank	J032Y9	5/23/05	465		1.00	0.42		0.20	0.26	C	0.06	9.6	C	4.00
North BCL	J03300	5/23/05	25300		6.15	4.7		1.23	5.2	C	0.06	4550	C	24.62
Dup of J03300	J03301	5/23/05	24600		6.15	3.7		1.23	5.1	C	0.06	4360	C	24.62
North BCL	J03302	5/23/05	26200		6.13	5.3		1.23	5.5	C	0.06	4440	C	24.51
North BCL	J03303	5/23/05	29200		6.09	3.9		1.22	5.3	C	0.06	4910	C	24.37
North BCL	J036V7	5/23/05	27500		6.13	4.7		1.23	5.6	C	0.06	4670	C	24.54
North BCL	J036V8	5/23/05	25000		6.12	3.6		1.22	5.4	C	0.06	4440	C	24.49
North BCL	J036V9	5/23/05	24200		6.17	4.6		1.23	6	C	0.06	4740	C	24.67
North BCL	J036W2	5/26/05	24700		6.67	4.2		1.33	5.9	C	0.07	4470	C	26.67
North BCL	J036W3	5/25/05	25800		6.32	3.6		1.26	6	C	0.06	4510	C	25.26
North BCL	J036W4	6/1/05	20900		6.17	7.4		1.23	9.8	C	0.06	5530	C	24.69
North BCL	J036W5	6/1/05	20900		6.13	5.9		1.23	8.8	C	0.06	4800	C	24.51
Dogleg	J037M9	6/7/05	19900		3.00	7.3		0.60	13.8	C	0.03	7390	C	12.01
Dogleg	J037N0	6/7/05	19400		3.00	6.6		0.60	13.3	C	0.03	7200	C	12.01
North loadout	J03D21	6/22/05	18400		6.37	2.8		1.27	2.8	C	0.06	3110		4.25
North loadout	J03D22	6/22/05	15500		6.35	1.7		1.27	2.6	C	0.06	2610		4.23
North loadout	J03D23	6/22/05	19600		6.37	4.1		1.27	3.1	C	0.06	3090		4.25
BCL stockpile	J03JN2	6/29/05	20600		6.02	3.7		1.20	4.4	C	0.06	3930		4.01
BCL stockpile	J03JN3	6/29/05	17700		6.02	3.7		1.20	5.9	C	0.06	3790		4.02
BCL stockpile	J03JN4	6/29/05	18700		6.01	4.8		1.20	6.2	C	0.06	3970		4.00
BCL stockpile	J03JN5	6/29/05	18200		6.02	4.8		1.20	4.7	C	0.06	3710		4.02
South loadout	J03JT6	6/30/05	22200		6.30	4.6		1.26	4.2	C	0.06	3720		4.20
BCL stockpile	J03JV0	7/1/05	21800		6.04	10.5		1.21	8.8	C	0.06	5080		4.03
BCL stockpile	J03JV1	7/1/05	20800		6.03	8.4		1.21	7.6	C	0.06	5020		4.02
BCL stockpile	J03JV3	7/1/05	19900		6.01	9		1.20	6.2	C	0.06	4250		4.01
BCL stockpile	J03JV5	7/1/05	17800		6.01	16		1.20	4.8	C	0.06	3640		4.00
BCL stockpile	J03JV6	7/1/05	13500		6.01	7.2		1.20	7	C	0.06	3470		4.01
North stockpile	J03JV7	7/7/05	19200		6.02	5.6		1.20	7.5	C	0.06	4170	C	24.10
North stockpile	J03JV8	7/7/05	21900		6.03	7.7		1.21	9.5	C	0.06	5260	C	24.12
North stockpile	J03JV9	7/7/05	21800		6.03	8		1.21	8.9	C	0.06	5170	C	24.12
North stockpile	J03N93	7/7/05	23200		6.02	6.6		1.20	8.8	C	0.06	5280	C	24.07
North stockpile	J03N94	7/7/05	19400		6.03	6.7		1.21	8.9	C	0.06	5050	C	24.12
North stockpile	J03N95	7/7/05	18600		6.02	6.3		1.20	8.8	C	0.06	4670	C	24.10
North stockpile	J03N96	7/7/05	19000		6.03	6.9		1.21	8	C	0.06	4870	C	24.12
North stockpile	J03N97	7/7/05	19100		6.03	7.1		1.21	8.4	C	0.06	4790	C	24.12
North stockpile	J03N99	7/7/05	18300		6.03	4.8		1.21	7	C	0.06	4400	C	24.12
North stockpile	J03NB3	7/11/05	17400		6.01	5		1.20	5.1	C	0.06	3730	C	24.05
Dogleg	J03NL5	7/14/05	20800		6.39	4		1.28	5.3		0.06	3950	C	4.26
Office trailers	J11VH3	3/30/06	--		--	2.4		0.21	--		--	--		--

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Sample Location	Sample Number	Sample Date	Manganese			Mercury			Molybdenum			Nickel		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
South of River	J02MN2	3/7/05	3.7		0.02	0.01	U	0.01	0.16	U	0.16	0.09	U	0.09
South of River	J02MN3	3/7/05	423		0.12	0.02	U	0.02	0.84	U	0.84	19.1		1.22
South of River	J02MN4	3/7/05	395		0.12	0.02	U	0.02	0.99	U	0.99	16		1.22
South loadout	J032Y0	4/21/05	207		0.02	0.017	U	0.017	0.315		0.97	5.4		0.21
South loadout	J032Y1	4/21/05	181		0.02	0.016	U	0.016	0.32		0.97	6.2		0.21
South loadout	J032Y2	4/21/05	237		0.02	0.016	U	0.016	0.299		0.95	7.1		0.21
Equip. Blank	J032Y9	5/23/05	4.4		0.02	0.01	U	0.01	0.83	C	5.40	0.18	U	0.18
North BCL	J03300	5/23/05	330		0.12	0.01	U	0.01	0.75	UC	0.75	10.7		1.23
Dup of J03300	J03301	5/23/05	328		0.12	0.01	U	0.01	0.84	UC	0.84	10		1.23
North BCL	J03302	5/23/05	355		0.12	0.02	U	0.02	0.95	UC	0.95	9.6		1.23
North BCL	J03303	5/23/05	336		0.12	0.01	U	0.01	1.1	C	5.48	9.3		1.22
North BCL	J036V7	5/23/05	349		0.12	0.01	U	0.01	0.85	UC	0.85	9.8		1.23
North BCL	J036V8	5/23/05	355		0.12	0.02	U	0.02	1.7	C	5.51	10		1.22
North BCL	J036V9	5/23/05	330		0.12	0.01	U	0.01	0.91	C	5.55	10.9		1.23
North BCL	J036W2	5/26/05	353		0.13	0.01	U	0.01	0.74	UC	0.74	10.8		1.33
North BCL	J036W3	5/25/05	360		0.13	0.01	U	0.01	0.86	UC	0.86	9.4		1.26
North BCL	J036W4	6/1/05	355	C	0.12	0.02	U	0.02	0.91	U	0.91	17.4		1.23
North BCL	J036W5	6/1/05	351	C	0.12	0.01	U	0.01	0.91	U	0.91	13.9		1.23
Dogleg	J037M9	6/7/05	354		0.06	0.015	U	0.015	0.74		2.70	20.1		0.60
Dogleg	J037N0	6/7/05	352		0.06	0.016	U	0.016	0.378	U	0.38	19.3		0.60
North loadout	J03D21	6/22/05	193		0.13	0.29		0.02	0.85	U	0.85	7.4		1.27
North loadout	J03D22	6/22/05	194		0.13	0.02		0.02	1.1		5.71	5.9		1.27
North loadout	J03D23	6/22/05	227		0.13	0.22		0.02	0.85	U	0.85	6.9		1.27
BCL stockpile	J03JN2	6/29/05	309		0.12	0.01	U	0.01	0.84	U	0.84	8.9		1.20
BCL stockpile	J03JN3	6/29/05	325		0.12	0.01	U	0.01	0.89		5.42	12.4		1.20
BCL stockpile	J03JN4	6/29/05	316		0.12	0.02	U	0.02	0.85		5.41	13.4		1.20
BCL stockpile	J03JN5	6/29/05	308		0.12	0.01	U	0.01	0.85	U	0.85	11.4		1.20
South loadout	J03JT6	6/30/05	284	C	0.13	0.06		0.02	0.96	U	0.96	8.5		1.26
BCL stockpile	J03JV0	7/1/05	398	C	0.12	0.01	U	0.01	0.91		5.44	14.6		1.21
BCL stockpile	J03JV1	7/1/05	365	C	0.12	0.02		0.02	0.9	U	0.90	13.4		1.21
BCL stockpile	J03JV3	7/1/05	360	C	0.12	0.01	U	0.01	0.91	U	0.91	11.9		1.20
BCL stockpile	J03JV5	7/1/05	330	C	0.12	0.02		0.02	0.9	U	0.90	12.5		1.20
BCL stockpile	J03JV6	7/1/05	333	C	0.12	0.06		0.02	0.9		5.41	12.4		1.20
North stockpile	J03JV7	7/7/05	336		0.12	0.02	U	0.02	0.88	U	0.88	13.2		1.20
North stockpile	J03JV8	7/7/05	406		0.12	0.01	U	0.01	0.89	U	0.89	14.5		1.21
North stockpile	J03JV9	7/7/05	403		0.12	0.02	U	0.02	0.88	U	0.88	13.5		1.21
North stockpile	J03N93	7/7/05	409		0.12	0.02	U	0.02	0.89	U	0.89	13.5		1.20
North stockpile	J03N94	7/7/05	374		0.12	0.02	U	0.02	0.89	U	0.89	13.9		1.21
North stockpile	J03N95	7/7/05	357		0.12	0.01	U	0.01	1.3		5.42	17.1		1.20
North stockpile	J03N96	7/7/05	362		0.12	0.02	U	0.02	0.89	U	0.89	13.3		1.21
North stockpile	J03N97	7/7/05	353		0.12	0.02	U	0.02	0.89	U	0.89	12.9		1.21
North stockpile	J03N99	7/7/05	340		0.12	0.01	U	0.01	0.88	U	0.88	12		1.21
North stockpile	J03NB3	7/11/05	316		0.12	0.02	U	0.02	0.87	U	0.87	9.3		1.20
Dogleg	J03NL5	7/14/05	332		0.13	0.015		0.02	0.955		5.75	9.7		1.28
Office trailers	J11VH3	3/30/06	--		--	0.02		0.02	--		--	--		--

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Sample Location	Sample Number	Sample Date	Phosphorus			Potassium			Selenium			Silicon		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
South of River	J02MN2	3/7/05	3.9		1.00	22.3	C	45.05	0.38	U	0.38	40.8	C	0.70
South of River	J02MN3	3/7/05	870		1.01	1690	C	273.83	2	U	2	312	C	4.26
South of River	J02MN4	3/7/05	744		1.01	1740	C	273.83	2.3	U	2.3	396	C	4.26
South of River	J02MN6	3/7/05	--		--	--		--	0.3	U	0.3	--		--
South loadout	J032Y0	4/21/05	758		1.07	601		48.34	0.302		0.35	205		0.75
South loadout	J032Y1	4/21/05	734		1.07	608		48.28	0.26	U	0.26	341		0.75
South loadout	J032Y2	4/21/05	996		1.06	728		47.57	0.35	U	0.35	291		0.74
Equip. Blank	J032Y9	5/23/05	4.9		1.00	27.8		45.00	0.41	U	0.41	270		4.20
North BCL	J03300	5/23/05	1150		1.03	1050		276.92	2.3	U	2.3	135		4.31
Dup of J03300	J03301	5/23/05	1130		1.03	1030		276.92	2.6	U	2.6	125		4.31
North BCL	J03302	5/23/05	1200		1.02	1130		275.79	2.9	U	2.9	128		4.29
North BCL	J03303	5/23/05	1240		1.02	1090		274.11	2.2	U	2.2	126		4.26
North BCL	J036V7	5/23/05	1170		1.02	1140		276.07	2.6	U	2.6	158		4.29
North BCL	J036V8	5/23/05	1130		1.02	1080		275.51	2.9	U	2.9	192		4.29
North BCL	J036V9	5/23/05	1160		1.03	1230		277.49	2.8	U	2.8	127		4.32
North BCL	J036W2	5/26/05	1040		1.11	1150		300.00	2.3	U	2.3	163		4.67
North BCL	J036W3	5/25/05	1210		1.05	1240		284.21	2.6	U	2.6	74.9		4.42
North BCL	J036W4	6/1/05	874		1.03	1380	C	277.78	2.8	U	2.8	437		4.32
North BCL	J036W5	6/1/05	751		1.02	1490	C	275.79	2.8	U	2.8	335		4.29
Dogleg	J037M9	6/7/05	999		1.00	2200		45.05	1.3		1.2	557	C	2.10
Dogleg	J037N0	6/7/05	950		1.00	2210		45.05	1.16	U	1.16	432	C	2.10
North loadout	J03D21	6/22/05	1100		1.06	725		47.77	2.6	U	2.6	1340		4.46
North loadout	J03D22	6/22/05	1170		1.06	494		47.62	2.7	U	2.7	1400		4.44
North loadout	J03D23	6/22/05	1060		1.06	669		47.77	2.6	U	2.6	539		4.46
BCL stockpile	J03JN2	6/29/05	1150		1.00	940		45.14	2.6	U	2.6	361		4.21
BCL stockpile	J03JN3	6/29/05	883		1.00	1110		45.18	2.5	U	2.5	386		4.22
BCL stockpile	J03JN4	6/29/05	790		1.00	1230		45.05	2.6	U	2.6	382		4.20
BCL stockpile	J03JN5	6/29/05	841		1.00	1080		45.18	2.6	U	2.6	384		4.22
South loadout	J03JT6	6/30/05	1170		1.05	780		47.27	2.9	U	2.9	366	C	4.41
BCL stockpile	J03JV0	7/1/05	843		1.01	1330		45.32	2.7	U	2.7	393	C	4.23
BCL stockpile	J03JV1	7/1/05	884		1.01	1400		45.23	2.8	U	2.8	321	C	4.22
BCL stockpile	J03JV3	7/1/05	868		1.00	1160		45.09	2.8	U	2.8	339	C	4.21
BCL stockpile	J03JV5	7/1/05	843		1.00	1070		45.05	2.8	U	2.8	381	C	4.20
BCL stockpile	J03JV6	7/1/05	636		1.00	958		45.09	2.7	U	2.7	286	C	4.21
North stockpile	J03JV7	7/7/05	825		1.00	1590	C	271.08	2.7	U	2.7	431	C	4.22
North stockpile	J03JV8	7/7/05	844		1.01	1730	C	271.36	2.7	U	2.7	361	C	4.22
North stockpile	J03JV9	7/7/05	831		1.01	1710	C	271.36	2.7	U	2.7	347	C	4.22
North stockpile	J03N93	7/7/05	940		1.00	1640	C	270.81	2.7	U	2.7	329	C	4.21
North stockpile	J03N94	7/7/05	764		1.01	1310	C	271.36	2.7	U	2.7	395	C	4.22
North stockpile	J03N95	7/7/05	720		1.00	1480	C	271.08	2.7	U	2.7	405	C	4.22
North stockpile	J03N96	7/7/05	794		1.01	1420	C	271.36	2.7	U	2.7	421	C	4.22
North stockpile	J03N97	7/7/05	803		1.01	1420	C	271.36	2.7	U	2.7	397	C	4.22
North stockpile	J03N99	7/7/05	855		1.01	1340	C	271.36	2.7	U	2.7	343	C	4.22
North stockpile	J03NB3	7/11/05	820		1.00	1110	C	270.54	2.7	U	2.7	437	C	4.21
Dogleg	J03NL5	7/14/05	1270		1.06	973		47.92	2.93	U	2.93	341	C	0.75
Office trailers	J11VH3	3/30/06	--		--	--		--	0.47	U	0.47	--		--

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Sample Location	Sample Number	Sample Date	Silver			Sodium			Strontium			Thallium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
South of River	J02MN2	3/7/05	0.55		0.05	8.4	C	2.00	0.23	C	0.01	0.61	U	0.61
South of River	J02MN3	3/7/05	0.25	U	0.25	212	C	2.03	33.3	C	0.06	3.2	U	3.2
South of River	J02MN4	3/7/05	0.29	U	0.29	208	C	2.03	33.9	C	0.06	3.8	U	3.8
South of River	J02MN6	3/7/05	0.59	U	0.59	--		--	--		--	--		--
South loadout	J032Y0	4/21/05	0.029	U	0.029	120	C	2.15	18.9	C	0.01	0.383	U	0.383
South loadout	J032Y1	4/21/05	0.032	U	0.032	150	C	2.15	21.4	C	0.01	0.422	U	0.422
South loadout	J032Y2	4/21/05	0.044	U	0.044	144	C	2.11	19.2	C	0.01	0.568	U	0.568
Equip. Blank	J032Y9	5/23/05	0.07	U	0.07	6.6	C	2.00	1.5	C	0.06	0.66	U	0.66
North BCL	J03300	5/23/05	0.42	U	0.42	253	C	12.31	26.4	C	0.06	3.7	U	3.7
Dup of J03300	J03301	5/23/05	0.47	U	0.47	253	C	12.31	25.8	C	0.06	4.2	U	4.2
North BCL	J03302	5/23/05	0.54	U	0.54	257	C	12.26	27.7	C	0.06	4.7	U	4.7
North BCL	J03303	5/23/05	0.41	U	0.41	246	C	12.18	29.1	C	0.06	3.6	U	3.6
North BCL	J036V7	5/23/05	0.48	U	0.48	244	C	12.27	27.5	C	0.06	4.2	U	4.2
North BCL	J036V8	5/23/05	0.53	U	0.53	240	C	12.24	27.4	C	0.06	4.6	U	4.6
North BCL	J036V9	5/23/05	0.51	U	0.51	239	C	12.33	25.7	C	0.06	4.5	U	4.5
North BCL	J036W2	5/26/05	0.42	U	0.42	296	C	13.33	26.8	C	0.07	3.7	UC	3.7
North BCL	J036W3	5/25/05	0.49	U	0.49	309	C	12.63	27.5	C	0.06	4.3	UC	4.3
North BCL	J036W4	6/1/05	0.51	U	0.51	328	C	12.35	41.3	C	0.06	4.5	U	4.5
North BCL	J036W5	6/1/05	0.51	U	0.51	222	C	12.26	28.6	C	0.06	4.5	U	4.5
Dogleg	J037M9	6/7/05	0.213	U	0.213	199	C	2.00	95.4	C	0.03	1.87	U	1.87
Dogleg	J037N0	6/7/05	0.213	U	0.213	200	C	2.00	83.6	C	0.03	1.87	U	1.87
North loadout	J03D21	6/22/05	0.48	U	0.48	347		2.12	31.6	C	0.06	4.2	U	4.2
North loadout	J03D22	6/22/05	0.49	U	0.49	237		2.12	32	C	0.06	4.3	U	4.3
North loadout	J03D23	6/22/05	0.48	U	0.48	216		2.12	21	C	0.06	4.2	U	4.2
BCL stockpile	J03JN2	6/29/05	0.48	U	0.48	229		2.01	29.1	C	0.06	4.2	U	4.2
BCL stockpile	J03JN3	6/29/05	0.47	U	0.47	175		2.01	27.3	C	0.06	4.1	U	4.1
BCL stockpile	J03JN4	6/29/05	0.47	U	0.47	166		2.00	27.6	C	0.06	4.1	U	4.1
BCL stockpile	J03JN5	6/29/05	0.48	U	0.48	140		2.01	33.2	C	0.06	4.2	U	4.2
South loadout	J03JT6	6/30/05	0.54	U	0.54	226	C	2.10	19.8	C	0.06	4.7	U	4.7
BCL stockpile	J03JV0	7/1/05	0.5	U	0.5	180	C	2.01	30.7	C	0.06	4.4	U	4.4
BCL stockpile	J03JV1	7/1/05	0.51	U	0.51	192	C	2.01	27.2	C	0.06	4.5	U	4.5
BCL stockpile	J03JV3	7/1/05	0.51	U	0.51	143	C	2.00	23.1	C	0.06	4.5	U	4.5
BCL stockpile	J03JV5	7/1/05	0.51	U	0.51	141	C	2.00	20.1	C	0.06	4.4	U	4.4
BCL stockpile	J03JV6	7/1/05	0.5	U	0.5	101	C	2.00	21.9	C	0.06	4.4	U	4.4
North stockpile	J03JV7	7/7/05	0.5	U	0.5	177	C	2.01	26.7	C	0.06	4.4	U	4.4
North stockpile	J03JV8	7/7/05	0.5	U	0.5	260	C	2.01	32.9	C	0.06	4.4	U	4.4
North stockpile	J03JV9	7/7/05	0.49	U	0.49	263	C	2.01	36.8	C	0.06	4.3	U	4.3
North stockpile	J03N93	7/7/05	0.5	U	0.5	213	C	2.01	32.3	C	0.06	4.4	U	4.4
North stockpile	J03N94	7/7/05	0.5	U	0.5	227	C	2.01	29.8	C	0.06	4.4	U	4.4
North stockpile	J03N95	7/7/05	0.5	U	0.5	168	C	2.01	30.2	C	0.06	4.4	U	4.4
North stockpile	J03N96	7/7/05	0.5	U	0.5	181	C	2.01	32.8	C	0.06	4.4	U	4.4
North stockpile	J03N97	7/7/05	0.5	U	0.5	183	C	2.01	30.1	C	0.06	4.4	U	4.4
North stockpile	J03N99	7/7/05	0.49	U	0.49	194	C	2.01	27	C	0.06	4.3	U	4.3
North stockpile	J03NB3	7/11/05	0.49	U	0.49	132	C	2.00	31.1	C	0.06	4.3	U	4.3
Dogleg	J03NL5	7/14/05	0.557	U	0.557	216		2.13	25.2	C	0.06	4.72	U	4.72
Office trailers	J11VH3	3/30/06	0.07	U	0.07	--		--	--		--	--		--

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Sample Location	Sample Number	Sample Date	Tin			Titanium			Uranium			Vanadium		
			mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL	mg/kg	Q	PQL
South of River	J02MN2	3/7/05	0.44	C	0.60	2.1	C	0.02	0.76	U	0.76	0.06	U	0.06
South of River	J02MN3	3/7/05	2.3	UC	2.30	1130	C	0.12	4	U	4	47.5		0.30
South of River	J02MN4	3/7/05	2.7	UC	2.70	1010	C	0.12	4.7	U	4.7	42.2		0.30
South of River	J02MN6	3/7/05	--		--	--		--	--		--	--		--
South loadout	J032Y0	4/21/05	0.917	C	0.64	977	C	0.02	0.477	U	0.477	27		0.05
South loadout	J032Y1	4/21/05	0.922	C	0.64	1040	C	0.02	0.526	U	0.526	28.7		0.05
South loadout	J032Y2	4/21/05	1.6	C	0.63	1030	C	0.02	0.708	U	0.708	30.4		0.05
Equip. Blank	J032Y9	5/23/05	2.8	UC	2.80	17.2	C	0.12	9.9	U	9.9	0.16		0.05
North BCL	J03300	5/23/05	2.6	UC	2.60	2090	C	0.12	9.2	U	9.2	63.5		0.31
Dup of J03300	J03301	5/23/05	2.9	UC	2.90	2340	C	0.12	10.4	U	10.4	66.6		0.31
North BCL	J03302	5/23/05	3.3	UC	3.30	2240	C	0.12	11.8	U	11.8	68.3		0.31
North BCL	J03303	5/23/05	2.5	UC	2.50	2400	C	0.12	8.9	U	8.9	72.3		0.30
North BCL	J036V7	5/23/05	3	UC	3.00	2500	C	0.12	10.5	U	10.5	70		0.31
North BCL	J036V8	5/23/05	3.3	UC	3.30	2360	C	0.12	11.7	U	11.7	67.7		0.31
North BCL	J036V9	5/23/05	3.2	UC	3.20	2160	C	0.12	11.2	U	11.2	66.7		0.31
North BCL	J036W2	5/26/05	2.6	U	2.60	2290	C	0.13	9.2	U	9.2	66.1		0.33
North BCL	J036W3	5/25/05	3	U	3.00	2440	C	0.13	10.7	U	10.7	67.3		0.32
North BCL	J036W4	6/1/05	3.2	UC	3.20	1130	C	0.12	11.3	U	11.3	44.9		0.31
North BCL	J036W5	6/1/05	3.2	UC	3.20	1240	C	0.12	11.2	U	11.2	45.8		0.31
Dogleg	J037M9	6/7/05	1.4	C	1.80	892	C	0.06	4.68	U	4.68	41.9		0.15
Dogleg	J037N0	6/7/05	1.32	C	1.80	839	C	0.06	4.68	U	4.68	41.3		0.15
North loadout	J03D21	6/22/05	3	UC	3.00	1400	C	0.13	10.5	U	10.5	40.4		0.32
North loadout	J03D22	6/22/05	3.1	UC	3.10	1020	C	0.13	10.8	U	10.8	27.6		0.32
North loadout	J03D23	6/22/05	3	UC	3.00	1420	C	0.13	10.5	U	10.5	38.7		0.32
BCL stockpile	J03JN2	6/29/05	3	UC	3.00	1480	C	0.12	10.5	U	10.5	43.8		0.30
BCL stockpile	J03JN3	6/29/05	2.9	UC	2.90	1020	C	0.12	10.3	U	10.3	39.4		0.30
BCL stockpile	J03JN4	6/29/05	2.9	UC	2.90	1040	C	0.12	10.3	U	10.3	41.5		0.30
BCL stockpile	J03JN5	6/29/05	3	UC	3.00	1400	C	0.12	10.5	U	10.5	44.2		0.30
South loadout	J03JT6	6/30/05	3.4	UC	3.40	1790	C	0.13	11.9	U	11.9	51.4		0.32
BCL stockpile	J03JV0	7/1/05	3.1	UC	3.10	1390	C	0.12	11.1	U	11.1	48.6		0.30
BCL stockpile	J03JV1	7/1/05	3.2	UC	3.20	1430	C	0.12	11.2	U	11.2	47.5		0.30
BCL stockpile	J03JV3	7/1/05	3.2	UC	3.20	1390	C	0.12	11.2	U	11.2	44.4		0.30
BCL stockpile	J03JV5	7/1/05	3.1	UC	3.10	1200	C	0.12	11.1	U	11.1	38		0.30
BCL stockpile	J03JV6	7/1/05	3.1	UC	3.10	792	C	0.12	11	U	11	28.2		0.30
North stockpile	J03JV7	7/7/05	3.1	UC	3.10	1010		0.12	10.9	U	10.9	43.6		0.30
North stockpile	J03JV8	7/7/05	3.1	UC	3.10	1160		0.12	11.1	U	11.1	49.2		0.30
North stockpile	J03JV9	7/7/05	3.1	UC	3.10	1200		0.12	10.9	U	10.9	47.5		0.30
North stockpile	J03N93	7/7/05	3.1	UC	3.10	1480		0.12	11	U	11	55.2		0.30
North stockpile	J03N94	7/7/05	3.1	UC	3.10	989		0.12	11	U	11	41.9		0.30
North stockpile	J03N95	7/7/05	3.1	UC	3.10	867		0.12	11	U	11	40		0.30
North stockpile	J03N96	7/7/05	3.1	UC	3.10	1080		0.12	11.1	U	11.1	41.2		0.30
North stockpile	J03N97	7/7/05	3.1	UC	3.10	1090		0.12	11	U	11	42.3		0.30
North stockpile	J03N99	7/7/05	3.1	UC	3.10	1110		0.12	10.9	U	10.9	40.9		0.30
North stockpile	J03NB3	7/11/05	3.1	UC	3.10	1290		0.12	10.8	U	10.8	43		0.30
Dogleg	J03NL5	7/14/05	3.34	UC	3.34	1580		0.13	11.8	U	11.8	43.9		0.32

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Sample Location	Sample Number	Sample Date	Zinc			Zirconium		
			mg/kg	Q	PQL	mg/kg	Q	PQL
South of River	J02MN2	3/7/05	0.59	C	0.06	0.28	U	0.28
South of River	J02MN3	3/7/05	50.6	C	0.37	21.4		3.65
South of River	J02MN4	3/7/05	49.1	C	0.37	19.3		3.65
South loadout	J032Y0	4/21/05	25.6		0.06	13.8		0.64
South loadout	J032Y1	4/21/05	25		0.06	13.3		0.64
South loadout	J032Y2	4/21/05	29.9		0.06	15.8		0.63
Equip. Blank	J032Y9	5/23/05	2		0.06	1.8	U	1.80
North BCL	J03300	5/23/05	47.2		0.37	23.8		3.69
Dup of J03300	J03301	5/23/05	48.5		0.37	20.4		3.69
North BCL	J03302	5/23/05	50.3		0.37	18.8		3.68
North BCL	J03303	5/23/05	48.3		0.37	10.1		3.65
North BCL	J036V7	5/23/05	50.5		0.37	20.4		3.68
North BCL	J036V8	5/23/05	54.8		0.37	15.6		3.67
North BCL	J036V9	5/23/05	45.4		0.37	13.4		3.70
North BCL	J036W2	5/26/05	48.6		0.40	28		4.00
North BCL	J036W3	5/25/05	50.5		0.38	30.1		3.79
North BCL	J036W4	6/1/05	48.9	C	0.37	17		3.70
North BCL	J036W5	6/1/05	52	C	0.37	23.8		3.68
Dogleg	J037M9	6/7/05	49.5	C	0.18	11.4		1.80
Dogleg	J037N0	6/7/05	48.7	C	0.18	11.7		1.80
North loadout	J03D21	6/22/05	33.3		0.38	12.6	C	3.82
North loadout	J03D22	6/22/05	28.3		0.38	8.8	C	3.81
North loadout	J03D23	6/22/05	34.3		0.38	9.7	C	3.82
BCL stockpile	J03JN2	6/29/05	41.9		0.36	9.1	C	3.61
BCL stockpile	J03JN3	6/29/05	40.2		0.36	3.7	C	3.61
BCL stockpile	J03JN4	6/29/05	40.7		0.36	2.9	C	3.60
BCL stockpile	J03JN5	6/29/05	40.2		0.36	3.9	C	3.61
South loadout	J03JT6	6/30/05	46.2	C	0.38	28.4		3.78
BCL stockpile	J03JV0	7/1/05	50.6	C	0.36	30.8		3.63
BCL stockpile	J03JV1	7/1/05	49.2	C	0.36	20.1		0.60
BCL stockpile	J03JV3	7/1/05	43.2	C	0.36	20.1		0.60
BCL stockpile	J03JV5	7/1/05	38	C	0.36	18.3		0.60
BCL stockpile	J03JV6	7/1/05	39.2	C	0.36	9.7		0.60
North stockpile	J03JV7	7/7/05	43.5		0.36	16.1		0.60
North stockpile	J03JV8	7/7/05	49.7		0.36	20.5		0.60
North stockpile	J03JV9	7/7/05	49		0.36	20.7		0.60
North stockpile	J03N93	7/7/05	51.4		0.36	24		0.60
North stockpile	J03N94	7/7/05	48.4		0.36	17.1		0.60
North stockpile	J03N95	7/7/05	46.8		0.36	14.9		0.60
North stockpile	J03N96	7/7/05	44.3		0.36	18.2		0.60
North stockpile	J03N97	7/7/05	44.6		0.36	18.8		0.60
North stockpile	J03N99	7/7/05	45.9		0.36	18.3		0.60
North stockpile	J03NB3	7/11/05	43.3		0.36	17.3		0.60
Dogleg	J03NL5	7/14/05	42.2		0.38	24.9		0.64

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Constituent	J02MN2 South of River Sample Date 3/7/05			J02MN3 South of River Sample Date 3/7/05			J02MN4 South of River Sample Date 3/7/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
	Semivolatile Organic Compounds								
1,2,4-Trichlorobenzene	330	U	330	340	U	340	340	U	340
1,2-Dichlorobenzene	330	U	330	340	U	340	340	U	340
1,3-Dichlorobenzene	330	U	330	340	U	340	340	U	340
1,4-Dichlorobenzene	330	U	330	340	U	340	340	U	340
2,4,5-Trichlorophenol	840	U	840	840	U	840	840	U	840
2,4,6-Trichlorophenol	330	U	330	340	U	340	340	U	340
2,4-Dichlorophenol	330	U	330	340	U	340	340	U	340
2,4-Dimethylphenol	330	U	330	340	U	340	340	U	340
2,4-Dinitrophenol	840	U	840	840	U	840	840	U	840
2,4-Dinitrotoluene	330	U	330	340	U	340	340	U	340
2,6-Dinitrotoluene	330	U	330	340	U	340	340	U	340
2-Chloronaphthalene	330	U	330	340	U	340	340	U	340
2-Chlorophenol	330	U	330	340	U	340	340	U	340
2-Methylnaphthalene	330	U	330	340	U	340	340	U	340
2-Methylphenol (cresol, o-)	330	U	330	340	U	340	340	U	340
2-Nitroaniline	840	U	840	840	U	840	840	U	840
2-Nitrophenol	330	U	330	340	U	340	340	U	340
3+4 Methylphenol (cresol, m+p)	330	U	330	340	U	340	340	U	340
3,3'-Dichlorobenzidine	330	U	330	340	U	340	340	U	340
3-Nitroaniline	840	U	840	840	U	840	840	U	840
4,6-Dinitro-2-methylphenol	840	U	840	840	U	840	840	U	840
4-Bromophenylphenyl ether	330	U	330	340	U	340	340	U	340
4-Chloro-3-methylphenol	330	U	330	340	U	340	340	U	340
4-Chloroaniline	330	U	330	340	U	340	340	U	340
4-Chlorophenylphenyl ether	330	U	330	340	U	340	340	U	340
4-Nitroaniline	840	U	840	840	U	840	840	U	840
4-Nitrophenol	840	U	840	840	U	840	840	U	840
Acenaphthene	330	U	330	340	U	340	340	U	340
Acenaphthylene	330	U	330	340	U	340	340	U	340
Anthracene	330	U	330	340	U	340	340	U	340
Benzo(a)anthracene	330	U	330	340	U	340	340	U	340
Benzo(a)pyrene	330	U	330	340	U	340	340	U	340
Benzo(b)fluoranthene	330	U	330	340	U	340	340	U	340
Benzo(ghi)perylene	330	U	330	340	U	340	340	U	340
Benzo(k)fluoranthene	330	U	330	340	U	340	340	U	340
Bis(2-chloro-1-methylethyl)ether	330	U	330	340	U	340	340	U	340
Bis(2-Chloroethoxy)methane	330	U	330	340	U	340	340	U	340
Bis(2-chloroethyl) ether	330	U	330	340	U	340	340	U	340
Bis(2-ethylhexyl) phthalate	22	JB	330	38	JB	340	27	JB	340
Butylbenzylphthalate	330	U	330	340	U	340	340	U	340
Carbazole	330	U	330	340	U	340	340	U	340
Chrysene	330	U	330	340	U	340	340	U	340
Di-n-butylphthalate	55	JB	330	26	JB	340	24	JB	340
Di-n-octylphthalate	330	U	330	340	U	340	340	U	340
Dibenz[a,h]anthracene	330	U	330	340	U	340	340	U	340
Dibenzofuran	330	U	330	340	U	340	340	U	340

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Constituent	J02MN2 South of River Sample Date 3/7/05			J02MN3 South of River Sample Date 3/7/05			J02MN4 South of River Sample Date 3/7/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Compounds (cont.)									
Diethylphthalate	21	J	330	340	U	340	340	U	340
Dimethyl phthalate	330	U	330	340	U	340	340	U	340
Fluoranthene	330	U	330	340	U	340	340	U	340
Fluorene	330	U	330	340	U	340	340	U	340
Hexachlorobenzene	330	U	330	340	U	340	340	U	340
Hexachlorobutadiene	330	U	330	340	U	340	340	U	340
Hexachlorocyclopentadiene	330	U	330	340	U	340	340	U	340
Hexachloroethane	330	U	330	340	U	340	340	U	340
Indeno(1,2,3-cd)pyrene	330	U	330	340	U	340	340	U	340
Isophorone	330	U	330	340	U	340	340	U	340
N-Nitroso-di-n-dipropylamine	330	U	330	340	U	340	340	U	340
N-Nitrosodiphenylamine	330	U	330	340	U	340	340	U	340
Naphthalene	330	U	330	340	U	340	340	U	340
Nitrobenzene	330	U	330	340	U	340	340	U	340
Pentachlorophenol	840	U	840	840	U	840	840	U	840
Phenanthrene	330	U	330	340	U	340	340	U	340
Phenol	330	U	330	340	U	340	340	U	340
Pyrene	330	U	330	340	U	340	340	U	340

Constituent	J02MN6 South of River Sample Date 3/7/05			J03NL5 Dogleg Sample Date 7/14/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL
Semivolatile Organic Compounds (cont.)						
1,2,4-Trichlorobenzene	17	U	17	360	U	360
1,2-Dichlorobenzene	12	U	12	360	U	360
1,3-Dichlorobenzene	12	U	12	360	U	360
1,4-Dichlorobenzene	14	U	14	360	U	360
2,4,5-Trichlorophenol	31	U	31	890	U	890
2,4,6-Trichlorophenol	32	U	32	360	U	360
2,4-Dichlorophenol	26	U	26	360	U	360
2,4-Dimethylphenol	29	U	29	360	U	360
2,4-Dinitrophenol	65	U	65	890	U	890
2,4-Dinitrotoluene	18	U	18	360	U	360
2,6-Dinitrotoluene	20	U	20	360	U	360
2-Chloronaphthalene	16	U	16	360	U	360
2-Chlorophenol	14	U	14	360	U	360
2-Methylnaphthalene	15	U	15	360	U	360
2-Methylphenol (cresol, o-)	20	U	20	360	U	360
2-Nitroaniline	38	U	38	890	U	890
2-Nitrophenol	20	U	20	360	U	360
3+4 Methylphenol (cresol, m+p)	--		--	360	U	360
3,3'-Dichlorobenzidine	23	U	23	360	U	360
3-Nitroaniline	26	U	26	890	U	890
4,6-Dinitro-2-methylphenol	63	U	63	890	U	890
4-Bromophenylphenyl ether	23	U	23	360	U	360
4-Chloro-3-methylphenol	27	U	27	360	U	360

**Table A-2. 100-B-14:1 Waste Characterization and
In-Process Analytical Results. (19 Pages)**

Constituent	J02MN6 South of River Sample Date 3/7/05			J03NL5 Dogleg Sample Date 7/14/05		
	µg/kg	Q	PQL	µg/kg	Q	PQL
	Semivolatile Organic Compounds (cont.)					
4-Chloroaniline	31	U	31	360	U	360
4-Chlorophenylphenyl ether	18	U	18	360	U	360
4-Methylphenol (cresol, p-)	51	U	51	--		--
4-Nitroaniline	22	U	22	890	U	890
4-Nitrophenol	43	U	43	890	U	890
Acenaphthene	17	U	17	360	U	360
Acenaphthylene	17	U	17	360	U	360
Anthracene	18	U	18	360	U	360
Benzo(a)anthracene	23	U	23	360	U	360
Benzo(a)pyrene	20	U	20	360	U	360
Benzo(b)fluoranthene	39	U	39	360	U	360
Benzo(ghi)perylene	100	U	100	360	U	360
Benzo(k)fluoranthene	19	U	19	360	U	360
Bis(2-chloro-1-methylethyl)ether	15	U	15	360	U	360
Bis(2-Chloroethoxy)methane	21	U	21	360	U	360
Bis(2-chloroethyl) ether	13	U	13	360	U	360
Bis(2-ethylhexyl) phthalate	34	U	34	45	JBC	360
Butylbenzylphthalate	26	U	26	360	U	360
Carbazole	20	U	20	360	U	360
Chrysene	14	U	14	360	U	360
Di-n-butylphthalate	28	U	28	41	J	360
Di-n-octylphthalate	140	U	140	360	U	360
Dibenz[a,h]anthracene	82	U	82	360	U	360
Dibenzofuran	23	U	23	360	U	360
Diethylphthalate	41	U	41	360	U	360
Dimethyl phthalate	20	U	20	360	U	360
Fluoranthene	23	U	23	360	U	360
Fluorene	19	U	19	360	U	360
Hexachlorobenzene	18	U	18	360	U	360
Hexachlorobutadiene	12	U	12	360	U	360
Hexachlorocyclopentadiene	72	U	72	360	U	360
Hexachloroethane	16	U	16	360	U	360
Indeno(1,2,3-cd)pyrene	17	U	17	360	U	360
Isophorone	19	U	19	360	U	360
N-Nitroso-di-n-dipropylamine	20	U	20	360	U	360
N-Nitrosodiphenylamine	21	U	21	360	U	360
Naphthalene	15	U	15	360	U	360
Nitrobenzene	18	U	18	360	U	360
Pentachlorophenol	120	U	120	890	U	890
Phenanthrene	16	U	16	360	U	360
Phenol	88	U	88	360	U	360
Pyrene	22	U	22	360	U	360

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Sample Location	Sample Number	Sample Date	Arsenic (TCLP)			Barium (TCLP)			Cadmium (TCLP)			Chromium (TCLP)			Lead (TCLP)		
			µg/L	Q	PQL	µg/L	Q	PQL	µg/L	Q	PQL	µg/L	Q	PQL	µg/L	Q	PQL
South of River	J02MN2	3/7/05	28.7		20	56.4	C	12	2.4	U	2.4	5.4		2.4	32.6		15
South of River	J02MN3	3/7/05	24.7		20	407	C	12	2.4	U	2.4	2.4	U	2.4	11.4	U	11.4
South of River	J02MN4	3/7/05	20.3		20	414	C	12	2.4	U	2.4	10.4		2.4	11.4	U	11.4
South of River	J02MN6	3/7/05	460	U	460	590	C	5	12	U	12	46	U	46	490	U	490
Dogleg	J037M9	6/7/05	27	U	27	829	C	12	18.8		2.4	4.2	U	4.2	15	U	15
Dogleg	J037N0	6/7/05	27	U	27	770	C	12	2.1		2.4	4.2	U	4.2	37.1		15
Dogleg	J03NL5	7/14/05	30.5	U	30.5	201		2	4.7	U	4.7	10.8	U	10.8	32.7	U	32.7
Near office trailers	J11VH3	3/30/06	24.6	U	24.6	147		2	4.2	U	4.2	6.4	U	6.4	26	U	26
Near B Avenue	J11VH4	3/30/06	24.6	U	24.6	235		2	4.2	U	4.2	6.4	U	6.4	26	U	26

Sample Location	Sample Number	Sample Date	Mercury (TCLP)			Selenium (TCLP)			Silver (TCLP)		
			µg/L	Q	PQL	µg/L	Q	PQL	µg/L	Q	PQL
South of River	J02MN2	3/7/05	0.1	U	0.1	24	U	24	3	U	3
South of River	J02MN3	3/7/05	0.1	U	0.1	24	U	24	3	U	3
South of River	J02MN4	3/7/05	0.1	U	0.1	24	U	24	3	U	3
South of River	J02MN6	3/7/05	0.23	U	0.23	610	U	610	11	U	11
Dogleg	J037M9	6/7/05	0.1	U	0.1	29.4	U	29.4	5.4	U	5.4
Dogleg	J037N0	6/7/05	5.36		0.1	29.4	U	29.4	5.4	U	5.4
Dogleg	J03NL5	7/14/05	0.1	U	0.1	30.7	U	30.7	5.6	U	5.6
Near office trailers	J11VH3	3/30/06	0.42		0.1	36.5	U	36.5	5.6	U	5.6
Near B Avenue	J11VH4	3/30/06	0.1	U	0.1	36.5	U	36.5	5.6	U	5.6

Sample Location	Sample Number	Sample Date	1,4-Dichlorobenzene (TCLP)			2,4,5-Trichlorophenol (TCLP)			2,4,6-Trichlorophenol (TCLP)			2,4-Dinitrotoluene (TCLP)			2-Methylphenol (cresol, o-) (TCLP)		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
South of River	J02MN2	3/7/05	0.05	U	0.05	0.12	U	0.12	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05
South of River	J02MN3	3/7/05	0.05	U	0.05	0.12	U	0.12	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05
South of River	J02MN4	3/7/05	0.05	U	0.05	0.12	U	0.12	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05
South of River	J02MN6	3/7/05	0.0046	U	0.0046	0.012	U	0.012	0.012	U	0.012	0.02	U	0.02	0.0046	U	0.0046
Dogleg	J03NL5	7/14/05	0.02	U	0.02	0.05	U	0.05	0.02	U	0.02	0.02	U	0.02	0.02	U	0.02

Table A-2. 100-B-14:1 Waste Characterization and In-Process Analytical Results. (19 Pages)

Sample Location	Sample Number	Sample Date	3+4 Methylphenol (cresol, m+p) (TCLP)			Hexachlorobenzene (TCLP)			Hexachlorobutadiene (TCLP)			Hexachloroethane (TCLP)			Nitrobenzene (TCLP)		
			mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL	mg/L	Q	PQL
South of River	J02MN2	3/7/05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05
South of River	J02MN3	3/7/05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05
South of River	J02MN4	3/7/05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05	0.05	U	0.05
South of River	J02MN6	3/7/05	0.0086	U	0.0086	0.0058	U	0.0058	0.0046	U	0.0046	0.004	U	0.004	0.0043	U	0.0043
Dogleg	J03NL5	7/14/05	0.02	U	0.02	0.02	U	0.02	0.02	U	0.02	0.02	U	0.02	0.02	U	0.02

Sample Location	Sample Number	Sample Date	Pentachlorophenol (TCLP)			Pyridine (TCLP)		
			mg/L	Q	PQL	mg/L	Q	PQL
South of River	J02MN2	3/7/05	0.12	U	0.12	0.05	U	0.05
South of River	J02MN3	3/7/05	0.12	U	0.12	0.05	U	0.05
South of River	J02MN4	3/7/05	0.12	U	0.12	0.05	U	0.05
South of River	J02MN6	3/7/05	0.019	U	0.019	0.0085	U	0.0085
Dogleg	J03NL5	7/14/05	0.05	U	0.05	0.02	U	0.02

APPENDIX B
SITE PHOTOGRAPHY

Photograph B-1. 100-B-14:1 Excavation West of the 105-B Reactor Building.

Photograph B-2. Demolition of 100-B-14:1 Pipeline Northwest of the Former 185/190-B Facility.

Photograph B-3. Exposed 100-B-14:1 Pipeline Northwest of the Former 185/190-B Facility.

Photograph B-4. Exposed 100-B-14:1 Pipeline Near Former Outfall.

Photograph B-5. Excavation and Demolished 100-B-14:1 Pipeline North of Former 185/190-B Facility.

APPENDIX C
CALCULATION BRIEFS

DISCLAIMER FOR CALCULATIONS

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

APPENDIX C CALCULATION BRIEFS

The following calculation briefs have been prepared in accordance with ENG-1, *Engineering Services*, ENG-1-4.5, "Project Calculations," Washington Closure Hanford, Richland, Washington.

100-B-14:1 Shallow Zone, Deep Zone, and Overburden Sampling Plan, Calculation No. 0100B-CA-V0285, Rev. 0, Washington Closure Hanford, Richland, Washington.

100-B-14:1 Overburden 1, 2, 3, 4, 5, and 6 Phase 3 Sampling Plan, Calculation No. 0100B-CA-V0297, Rev. 0, Washington Closure Hanford, Richland, Washington.

100-B-14:1 Shallow Zone and Overburden Variance Calculation, Calculation No. 0100B-CA-V0286, Rev. 0, Washington Closure Hanford, Richland, Washington.

100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations, Calculation No. 0100B-CA-V0287, Rev. 1, Washington Closure Hanford, Richland, Washington.

NOTE: The calculation briefs referenced in this appendix are kept in the active Washington Closure Hanford project files and are available upon request. When the project is completed, the files will be stored in a U.S. Department of Energy, Richland Operations Office repository.

CALCULATION COVER SHEET

Project Title:	100-B-14:1 Process and Sanitary Sewer Pipelines		
	Sample Design	Job No.	14655
Area	100-B/C		
Discipline	Environmental Engineering	*Calc. No.	0100B-CA-V0285
Subject	100-B-14:1 Shallow Zone, Deep Zone, and Overburden Sampling Plan		
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 Sht Calc = 3 Shts Attach1 = 1 Sht Attach2 = 1 Sht Attach3 = 14 Shts Total = 20 Shts	G. Cruz 7-23-06	C.A. Bentz 7/27/06	C.R. Martinez 08/02/06	D.N. Strom 8-2-06	8-2-06
SUMMARY OF REVISIONS						

WCH-DE-018 (4/14/06)

*Obtain Calc. No. from R&DC and Form from Intranet

CALCULATION SHEET

1	Problem:	Calculate and display required sampling nodes in concurrence with 100 Area
2		SAP DOE/RL-96-22 Rev. 4 for verification and closure.
3		
4	Given:	-SAP (DOE/RL-96-22 Rev. 4) and IG (0100X-IG-G0001 Rev. 5) requirements
5		-Shallow Sampling Area (Surface area of each zone determined from CAD program,
6		Attachment 3, Shts 1 of 14, CAD file 1BC:071906A, 100-B-14:1 Process and Sanitary Sewer Pipelines
7		(Phase 1) Shallow Zone Sampling Plan,
8		Attachment 3, Shts 2 of 14, CAD file 1BC:071906B, 100-B-14:1 Process and Sanitary Sewer Pipelines
9		(Phase 2) Shallow Zone Sampling Plan)
10		
11		-Deep Zone Sampling Area (Surface area of each zone determined from CAD program,
12		Attachment 3, Shts 3 of 14, CAD file 1BC:071906A, 100-B-14:1 Process and Sanitary Sewer Pipelines
13		(Phase 1) Deep Zone Sampling Plan,
14		Attachment 3, Shts 4 of 14, CAD file 1BC:071906B, 100-B-14:1 Process and Sanitary Sewer Pipelines
15		(Phase 2) Deep Zone Sampling Plan)
16		
17		-Overburden Sampling Area (Surface area of each zone determined from CAD program,
18		Attachment 3, Shts 5 of 14, CAD file 1BC:071906C, 100-B-14:1 Process and Sanitary Sewer Pipelines
19		Overburden Sampling Plan - 1,
20		Attachment 3, Shts 6 of 14, CAD file 1BC:071906C, 100-B-14:1 Process and Sanitary Sewer Pipelines
21		Overburden Sampling Plan - 2,
22		Attachment 3, Shts 7 of 14, CAD file 1BC:071906C, 100-B-14:1 Process and Sanitary Sewer Pipelines
23		Overburden Sampling Plan - 3,
24		Attachment 3, Shts 8 of 14, CAD file 1BC:071906C, 100-B-14:1 Process and Sanitary Sewer Pipelines
25		Overburden Sampling Plan - 4,
26		Attachment 3, Shts 9 of 14, CAD file 1BC:071906C, 100-B-14:1 Process and Sanitary Sewer Pipelines
27		Overburden Sampling Plan - 5)
28		
29		Attachment 3, Shts 10 of 14, CAD file 1BC:071906D, 100-B-14:1 Process and Sanitary Sewer Pipelines
30		(Phase 1 and 2) Shallow Zone Sample Design Coordinate Table
31		Attachment 3, Shts 11 of 14, CAD file 1BC:071906D, 100-B-14:1 Process and Sanitary Sewer Pipelines
32		Overburden Sample Design Coordinate Table - 1
33		Attachment 3, Shts 12 of 14, CAD file 1BC:071906D, 100-B-14:1 Process and Sanitary Sewer Pipelines
34		Overburden Sample Design Coordinate Table - 2
35		Attachment 3, Shts 13 of 14, CAD file 1BC:071906D, 100-B-14:1 Process and Sanitary Sewer Pipelines
36		Overburden Sample Design Coordinate Table - 3
37		
38		Attachment 3, Shts 14 of 14, CAD file 1BC:071906A, 100-B-14:1 Process and Sanitary Sewer Pipelines
39		(Phase 1 & 2) Pipeline Excavation Alignment Profile
40		
41	SAP and IG Requirements:	
42		-Develop a 16 node sampling grid for the sampling area
43	Shallow Zone:	-Use appendix A of the IG to determine which six of the sixteen will be sampled
44		to collect variance and clean up verification samples
45		
46		-Develop a 16 node sampling grid for the sampling area
47	Overburden:	-Use appendix A of the IG to determine which six of the sixteen will be sampled
48		to collect variance and clean up verification samples
49		
50		-Develop a 16 node sampling grid for the sampling area
51	Deep Zone:	-Use appendix A of the IG to determine which four of the sixteen will be sampled
52		to collect variance/verification samples
53		
54		

Washington Closure Hanford

CALCULATION SHEET

Originator G. Cruz Date 7/23/2006 Calc. No. 0100B-CA-V0285 Rev. No. 0
 Project 100-B-14:1 Process and Sanitary Sewer
Pipelines Sample Design Job No. 14655 Checked AB Date 7/27/06
 Subject 100-B-14:1 Shallow Zone, Deep Zone, and Overburden Sampling Plan Sheet No. 2 of 3

1	
2	
3	Determination of (Phase 1 & 2) Shallow Zone Sampling Grid:
4	
5	Shallow Zone Sampling Grid Area determined from Table 5-1, IG
6	Attachment 2, Number of Decision Subunits Based on Area (Converted to Sq Meters)
7	
8	Total Area: >>20466 m ²
9	Area of Decision Subunits (unknown total subunits) 3720.00 m ²
10	
11	Decision Subunit divided into 4 Sampling Areas: 930.00 m ²
12	
13	Sampling Areas divided into a 16 node grid (node numbers 1-16): 58.12 m ²
14	
15	Nodes to be Sampled (as determined from Attachment 1, Table A-1, Sample Grid Point Lookup Table)
16	See Attachment 3, Shts 10 of 14, 100-B-14:1 Process and Sanitary Sewer Pipelines (Phase 1 & 2) Shallow Zone
17	Sample Design Coordinate Table, for Sample Location Table
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29	Determination of (Phase 1 & 2) Deep Zone Sampling Grid:
30	
31	Deep Zone Sampling Grid Area determined from Table 5-1, IG
32	Attachment 2, Number of Decision Subunits Based on Area (Converted to Sq Meters)
33	
34	Total Area: >>20466 m ²
35	Area of Decision Subunits (unknown total subunits) 3720.00 m ²
36	
37	Decision Subunit divided into 3 Sampling Areas: 1240.00 m ²
38	
39	Sampling Areas divided into a 16 node grid (node numbers 1-16): 77.50 m ²
40	
41	Nodes to be Sampled (as determined from Attachment 1, Table A-1, Sample Grid Point Lookup Table)
42	See Attachment 3, Sht 3 of 14, 100-B-14:1 Process and Sanitary Sewer Pipelines (Phase 1) Deep Zone Sampling Plan,
43	See Attachment 3, Sht 4 of 14, 100-B-14:1 Process and Sanitary Sewer Pipelines (Phase 2) Deep Zone Sampling Plan,
44	for Sample Location Table

CALCULATION SHEET

Originator	<u>G. Cruz</u>	Date	<u>7/23/2006</u>	Calc. No.	<u>0100B-CA-V0285</u>	Rev. No.	<u>0</u>
Project	<u>100-B-14:1 Process and Sanitary Sewer Pipelines Sample Design</u>			Job No.	<u>14655</u>	Checked	<u>asb</u> Date <u>7/23/06</u>
Subject	<u>100-B-14:1 Shallow Zone, Deep Zone, and Overburden Sampling Plan</u>					Sheet No. 3 of 3	

[illegible]

Washington Closure Hanford

Originator G. Cruz Date 7/23/2006 Calc. No. 0100B-CA-V0285 Rev. No. 0
 Project 100-B-14:1 Process and Sanitary Sewer
Pipelines Sample Design Job No. 14655 Checked AB Date 7/27/06
 Subject 100-B-14:1 Shallow Zone, Deep Zone, and Overburden Sampling Plan Sheet No 1 of 1

1 ATTACHMENT 1

2

3 Sample Grid Point Lookup Table.

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Default Plan	Sampling Area 1	Sampling Area 2	Sampling Area 3	Sampling Area 4	Sampling Area 5	Sampling Area 6	Sampling Area 7	Sampling Area 8	Sampling Area 9	Sampling Area 10
Variance/Verification	3	6	1	4	5	1	3	3	4	16
Variance/Verification	4	7	11	3	15	15	5	13	10	10
Variance/Verification	16	3	2	7	7	10	11	4	3	14
Variance/Verification	10	15	4	12	1	13	4	8	16	4
Variance	2	14	5	9	13	12	8	2	14	8
Variance	13	10	9	13	2	16	1	12	5	3
Not Sampling	6	1	10	8	14	4	16	5	8	6
Not Sampling	1	9	13	1	10	5	12	1	1	15
Not Sampling	9	12	7	5	6	2	6	7	15	9
Not Sampling	15	16	15	14	16	6	2	15	11	1
Not Sampling	8	13	8	10	12	11	13	14	2	12
Not Sampling	5	2	3	11	4	3	9	10	7	11
Not Sampling	7	11	14	15	11	14	14	6	13	2
Not Sampling	11	4	6	2	9	7	7	11	9	7
Not Sampling	12	8	16	16	3	8	15	9	6	13
Not Sampling	14	5	12	6	8	9	10	16	12	5

23 ** Note: Grid nodes for each sampling area in each waste site should be numbered consistently, e.g., begin numbering
 24 the nodes in the northwestern-most node, then number consecutively left to right.

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Washington Closure Hanford

Originator G. Cruz Date 7/23/2006 Calc. No. 0100B-CA-V0285 Rev. No. 0
 Project 100-B-14:1 Process and Sanitary Sewer
Pipelines Sample Design Job No. 14655 Checked CB Date 7/27/06
 Subject 100-B-14:1 Shallow Zone, Deep Zone, and Overburden Sampling Plan Sheet No. 1 of 1

1 ATTACHMENT 2

2

3 Number of Decision Subunits Based on Area.

4

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Area of Primary Decision Unit (m2)	Number of Subunits
<1,394	1
>1,394 to <2,326	2
>2,326 to <3,256	3
>3,256 to <4,186	4
>4,186 to <9,303	2
>9,303 to <13,024	3
>13,024 to <16,745	4
>16,745 to <20,466	5
>20,466	ROUNDa (Area/3,720)
a ROUND is an integer rounding function.	

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1BC:071906D					SAMPLE LOCATION TABLE										NOTES					
SHALLOW ZONE (PHASE 1) TABLE										SHALLOW ZONE (PHASE 2) TABLE					1. SEE ATTACHMENT 3 SHEET 1 OF 14 FOR SHALLOW ZONE (PHASE 1) SAMPLING PLAN. 2. SEE ATTACHMENT 3 SHEET 2 OF 14 FOR SHALLOW ZONE (PHASE 2) SAMPLING PLAN.					
DECISION SUBUNIT	SAMPLING AREA	SAMPLE NODE	NORTHING	EASTING	DECISION SUBUNIT	SAMPLING AREA	SAMPLE NODE	NORTHING	EASTING	DECISION SUBUNIT	SAMPLING AREA	SAMPLE NODE	NORTHING	EASTING						
1	A1	S-A1-2	145286.88	565251.10	4	D3	S-D3-1	145216.73	565260.50	7	G5	S-G5-1	144980.32	565173.95						
		S-A1-3	145277.06	565250.79			S-D3-2	145206.79	565261.07			S-G5-2	144980.38	565163.39						
		S-A1-4	145268.24	565250.50			S-D3-4	145186.83	565261.44			S-G5-5	144975.64	565152.29						
		S-A1-10	145292.22	565261.99			S-D3-5	145177.42	565261.68			S-G5-7	144966.25	565153.96						
		S-A1-13	145303.81	565267.47			S-D3-9	145217.47	565267.09			S-G5-13	144721.03	565001.95						
		S-A1-16	145270.67	565267.16			S-D3-11	145199.98	565267.25			S-G5-15	144717.00	564992.46						
	A2	S-A2-3	145235.64	565250.69		D4	S-D4-3	145127.15	565262.46		G6	S-G6-1	144709.56	564985.86						
		S-A2-6	145247.33	565255.59			S-D4-4	145119.05	565262.57			S-G6-10	144611.41	565151.80						
		S-A2-7	145236.07	565255.74			S-D4-7	145093.83	565263.13			S-G6-12	144611.33	565168.93						
		S-A2-10	145248.34	565260.89			S-D4-9	145145.28	565271.28			S-G6-13	144615.19	565181.61						
		S-A2-14	145248.91	565266.30			S-D4-12	145121.05	565269.12			S-G6-15	144614.41	565202.18						
		S-A2-15	145238.02	565266.43			S-D4-13	145111.24	565269.74			S-G6-16	144611.29	565202.45						
	A3	S-A3-1	145209.16	565249.93		D5	S-D5-1	145076.11	565264.06		G7	S-G7-1	144612.15	565215.74						
		S-A3-2	145192.47	565249.72			S-D5-2	145067.62	565263.92			S-G7-3	144631.05	565216.89						
		S-A3-4	145159.08	565249.02			S-D5-5	145075.60	565270.69			S-G7-4	144629.63	565220.98						
		S-A3-5	145207.22	565253.47			S-D5-7	145057.61	565270.53			S-G7-5	144643.78	565216.88						
		S-A3-9	145169.89	565215.42			S-D5-13	145039.76	565269.23			S-G7-8	144646.73	565225.76						
		S-A3-11	145155.80	565230.00			S-D5-15	145026.92	565267.04			S-G7-11	144618.43	565226.67						
	A4	S-A4-3	145093.71	565248.47		D6	S-D6-1	145023.26	565247.76		G8	S-G8-2	144648.74	565227.99						
		S-A4-4	145077.05	565248.72			S-D6-10	145011.84	565253.68			S-G8-3	144656.01	565230.93						
		S-A4-7	145090.01	565252.32			S-D6-12	144998.51	565236.28			S-G8-4	144648.40	565238.78						
		S-A4-9	145063.56	565250.82			S-D6-13	145012.51	565268.58			S-G8-8	144647.42	565254.76						
		S-A4-12	145044.92	565246.53			S-D6-15	145007.97	565258.01			S-G8-12	144672.83	565264.99						
		S-A4-13	145039.71	565235.81			S-D6-16	145000.18	565244.19			S-G8-13	144684.48	565260.85						
	2	B5	S-B5-1	145026.77		565218.21	5	E7	S-E7-1		145000.38	565222.42	8	H9		S-H9-3	144668.62	565269.11		
			S-B5-2	145021.35		565213.11			S-E7-3		144988.83	565210.15				S-H9-4	144668.63	565274.54		
			S-B5-5	144993.54		565189.85			S-E7-4		144982.99	565204.14				S-H9-5	144666.34	565268.12		
			S-B5-7	144968.94		565166.27			S-E7-5		144976.30	565197.54				S-H9-10	144656.53	565263.61		
			S-B5-13	144985.34		565187.58			S-E7-8		144956.89	565177.20				S-H9-14	144660.91	565269.24		
			S-B5-15	144965.44		565168.13			S-E7-11		144983.13	565213.49				S-H9-16	144655.78	565270.66		
		B6	S-B6-1	144945.91		565144.33		E8	S-E8-2		144944.11	565165.55		H10		S-H10-3	144649.82	565264.43		
			S-B6-10	144926.17		565128.96			S-E8-3		144938.05	565159.85				S-H10-4	144645.37	565263.98		
			S-B6-12	144898.58		565100.79			S-E8-4		144931.67	565153.96				S-H10-8	144647.12	565269.73		
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			S-B6-15	144864.65		565066.73			S-E8-12		144927.16	565159.39				S-H10-14	144648.80	565276.75		
			S-B6-16	144854.02		565055.43			S-E8-13		144921.54	565154.08				S-H10-16	144648.88	565279.49		
		B7	S-B7-1	144844.98		565040.41		E9	S-E9-3		144886.83	565111.38		H1		S-H1-2	144648.31	565263.70		
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			S-B7-4	144804.32		565020.52			S-E9-5		144874.54	565099.39				S-H1-4	144648.54	565288.63		
			S-B7-5	144787.58		565019.85			S-E9-10		144888.98	565122.85				S-H1-10	144653.00	565296.89		
			S-B7-8	144739.98		565019.87			S-E9-14		144864.24	565098.94				S-H1-13	144661.43	565293.53		
			S-B7-11	144817.39		565025.73			S-E9-16		144851.82	565087.62				S-H1-16	144664.77	565297.03		
		B8	S-B8-2	144708.08		565019.92		E10	S-E10-3		144843.80	565082.94		H2		S-H2-3	144672.23	565293.53		
			S-B8-3	144696.59		565020.23			S-E10-4		144837.91	565086.19				S-H2-6	144675.79	565296.54		
			S-B8-4	144685.07		565020.69			S-E10-8		144829.82	565082.27				S-H2-7	144680.46	565293.09		
			S-B8-8	144640.55		565022.15			S-E10-10		144832.94	565066.68				S-H2-10	144683.39	565296.11		
			S-B8-12	144679.35		565025.32			S-E10-14		144827.36	565056.36				S-H2-14	144691.68	565295.65		
			S-B8-13	144665.64		565027.49			S-E10-16		144821.27	565064.66				S-H2-15	144695.50	565292.49		
3		C9	S-C9-3	144630.10	565028.35	6		F1	S-F1-2	144815.75	565046.94				Attachment <u>3</u> Sheet No. <u>10 of 14</u> Originator <u>G.C.RUL</u> Date <u>7-23-06</u> Chk'd By <u>MB</u> Date <u>7/27/06</u> Calc. No. <u>0100B-CA-VD285</u> Rev. No. <u>10</u>					
			S-C9-4	144618.18	565027.92				S-F1-3	144810.42	565046.74									
			S-C9-5	144605.93	565023.58				S-F1-4	144804.51	565046.85									
			S-C9-10	144595.61	565038.89				S-F1-10	144810.27	565057.01									
			S-C9-14	144585.52	565047.51				S-F1-13	144794.84	565057.86									
			S-C9-16	144588.71	565054.86				S-F1-16	144775.76	565052.52									
		C10	S-C10-3	144598.40	565074.80			F2	S-F2-3	144747.47	565043.78									
			S-C10-4	144598.50	565081.32				S-F2-6	144711.93	565045.00									
			S-C10-8	144598.44	565106.14				S-F2-7	144698.09	565045.21									
			S-C10-10	144590.78	565070.56				S-F2-10	144756.60	565051.47									
			S-C10-14	144580.29	565100.64				S-F2-14	144712.12	565049.49									
			S-C10-16	144579.68	565106.06				S-F2-15	144698.75	565049.69									
		C1	S-C1-2	144599.33	565119.94			F3	S-F3-1	144675.02	565044.25									
			S-C1-3	144599.48	565126.79				S-F3-2	144667.03	565043.40									
			S-C1-4	144599.63	565133.57				S-F3-4	144656.55	565041.98									
			S-C1-10	144580.88	565113.87				S-F3-5	144651.27	565041.70									
			S-C1-13	144591.77	565134.79				S-F3-9	144673.11	565050.88									
			S-C1-16	144591.98	565159.01				S-F3-11	144663.37	565051.55									
		C2	S-C2-3	144600.37	565179.13			F4	S-F4-3	144624.72	565042.26									
			S-C2-6	144600.34	565199.43				S-F4-4	144626.45	565052.00									
			S-C2-7	144600.27	565206.54				S-F4-7	144619.04	565052.62									
			S-C2-10	144591.93	565174.48				S-F4-9	144616.72	565068.93									
			S-C2-14	144591.66	565201.19				S-F4-12	144617.03	565114.52									
			S-C2-15	144591.95	565208.08				S-F4-13	144612.61	565068.56									

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVIER CORRIDOR CLOSURE CONTRACT

100-B/C AREA
100-B-14:1 PROCESS AND SANITARY
SEWER PIPELINES - SHALLOW ZONE
SAMPLE DESIGN COORDINATE TABLE

1BC:071906D

SAMPLE LOCATION TABLE

NOTES

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O-H10-4

144962.44

564935.60

O-H10-8

144926.53

564935.90

O-H10-10

144977.52

564928.90

O-H10-14

144942.33

564929.28

O-H10-16

144925.69

564929.54

H1

O-H1-2

144978.50

564922.46

O-H1-3

144969.94

564922.50

O-H1-4

144961.35

564922.55

O-H1-10

144977.64

564915.79

O-H1-13

144952.18

564915.83

O-H1-16

144927.10

564915.97

H2

O-H2-3

144966.92

564908.51

O-H2-6

144945.06

564908.55

O-H2-7

144937.62

564908.56

O-H2-10

144951.26

564900.97

O-H2-14

144887.34

565014.54

O-H2-15

144890.46

565008.52

9

I3

O-I3-1

144876.84

564922.24

O-I3-2

144866.94

564922.21

O-I3-4

144848.96

564922.62

O-I3-5

144878.33

564928.77

O-I3-9

144879.22

564934.60

O-I3-11

144859.07

564934.52

O-I3-13

144859.89

564945.79

I4

O-I4-3

144849.43

564945.77

O-I4-7

144860.12

564951.22

O-I4-9

144882.49

564956.64

O-I4-12

144849.63

564956.51

O-I4-13

144883.26

564961.81

I5

O-I5-1

144884.23

564966.97

O-I5-2

144872.86

564966.93

O-I5-5

144884.85

564972.04

O-I5-7

144861.56

564971.87

O-I5-13

144885.81

564981.73

O-I5-15

144861.78

564981.64

I6

O-I6-1

144885.62

564986.47

O-I6-10

144880.97

564997.78

O-I6-12

144877.87

565005.64

O-I6-13

144874.78

564999.72

O-I6-15

144859.63

564997.72

O-I6-16

144849.51

564996.86

1. SEE ATTACHMENT 3 SHEETS 5, 6, 7, 8, AND 9 OF 14 FOR OVERBURDEN SAMPLING PLAN.

Attachment 3
Originator E.C.R.L.
Chk'd By MS
Calc. No. 0100K-CA-V0785

Sheet No. 11 of 14
Date 7-23-06
Rev. No. 6

ATTACHMENT 3

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

100-B/C AREA
100-B-14:1 PROCESS AND SANITARY
SEWER PIPELINES - OVERBURDEN
SAMPLE DESIGN COORDINATE TABLE - 1

Remaining Sites Verification Package for the 100-B-14:1 Process Sewer

C-19

1BC:071906D

SAMPLE LOCATION TABLE

DECISION SUBUNIT	SAMPLING AREA	SAMPLE NODE	NORTHING	EASTING		
10	J7	O-J7-1	144839.45	564923.15		
		O-J7-3	144820.53	564923.14		
		O-J7-4	144808.15	564923.37		
		O-J7-5	144838.65	564928.87		
		O-J7-8	144806.05	564928.62		
		O-J7-11	144816.93	564933.97		
		J8	O-J8-2	144827.76	564944.56	
			O-J8-3	144816.89	564944.47	
			O-J8-4	144806.07	564944.38	
			O-J8-8	144806.14	564949.67	
			O-J8-12	144806.16	564954.93	
			O-J8-13	144838.82	564960.44	
	J9		O-J9-3	144816.85	564965.50	
			O-J9-4	144806.09	564965.43	
		O-J9-5	144838.81	564970.88		
		O-J9-10	144827.97	564976.10		
		O-J9-14	144828.19	564981.39		
		O-J9-16	144806.32	564981.24		
		J10	O-J10-3	144816.42	564986.54	
			O-J10-4	144805.94	564986.54	
	O-J10-8		144806.25	564992.00		
	O-J10-10		144828.04	564997.08		
	O-J10-14		144806.77	565002.33		
	O-J10-16		144803.78	565010.05		
	11		K1	O-K1-2	144788.24	564929.44
				O-K1-3	144795.35	564936.09
		O-K1-4		144783.86	564936.10	
		O-K1-10		144786.45	564950.12	
		O-K1-13		144794.89	564955.49	
		O-K1-16		144759.14	564955.76	
		K2		O-K2-3	144771.23	564960.49
				O-K2-6	144782.87	564965.28
				O-K2-7	144770.96	564965.28
				O-K2-10	144782.91	564970.09
				O-K2-14	144782.64	564974.89
				O-K2-15	144770.78	564974.92
			K3	O-K3-1	144794.97	564979.68
				O-K3-2	144783.24	564979.71
		O-K3-4		144759.37	564979.77	
		O-K3-5		144794.86	564984.57	
		O-K3-9		144794.89	564989.40	
		O-K3-11		144771.25	564989.40	
		K4		O-K4-3	144771.37	564999.11
				O-K4-4	144759.55	564999.17
			O-K4-7	144771.40	565003.97	
			O-K4-9	144795.02	565008.73	
			O-K4-12	144759.69	565008.89	
			O-K4-13	144794.97	565013.74	
12			L5	O-L5-1	144749.60	564959.94
				O-L5-2	144749.75	564969.08
		O-L5-5		144749.63	564993.56	
		O-L5-7		144749.83	565008.11	
		O-L5-13		144741.66	565001.23	
		O-L5-15		144745.46	565013.45	
		L6		O-L6-1	144660.25	564939.00
				O-L6-10	144670.95	564960.75
				O-L6-12	144654.99	564960.62
				O-L6-13	144682.73	564968.01
				O-L6-15	144665.37	564967.76
				O-L6-16	144656.58	564967.63
			L7	O-L7-1	144686.49	564974.72
				O-L7-3	144667.11	564974.34
		O-L7-4		144657.94	564974.17	
		O-L7-5		144692.05	564980.83	
		O-L7-8		144659.64	564980.20	
		O-L7-11		144672.88	564985.78	
		L8		O-L8-2	144686.04	564995.72
				O-L8-3	144674.36	564995.57
			O-L8-4	144662.82	564995.41	
			O-L8-8	144663.96	565000.51	
			O-L8-12	144664.33	565005.68	
			O-L8-13	144694.55	565010.79	
	13		M9	O-M9-3	144619.60	564936.65
				O-M9-4	144609.11	564936.65
		O-M9-5		144642.89	564942.40	
		O-M9-10		144632.69	564947.45	
		O-M9-14		144633.44	564952.67	
		O-M9-16		144611.43	564952.33	
		M10		O-M10-3	144623.42	564957.76
				O-M10-4	144612.34	564957.62
				O-M10-8	144613.33	564962.89
				O-M10-10	144636.30	564968.35
				O-M10-14	144637.35	564973.60
				O-M10-16	144615.10	564973.33
			M1	O-M1-2	144638.02	564978.80
				O-M1-3	144627.03	564978.67
		O-M1-4		144615.91	564978.53	
		O-M1-10		144639.92	564989.22	
		O-M1-13		144652.10	564994.57	
		O-M1-16		144618.64	564994.16	
		M2		O-M2-3	144630.28	564999.47
				O-M2-6	144642.61	565004.75
			O-M2-7	144631.59	565004.71	
			O-M2-10	144643.52	565009.93	
			O-M2-14	144642.58	565015.23	
			O-M2-15	144632.00	565015.34	
14			N3	O-N3-1	144600.45	564938.50
				O-N3-2	144594.04	564939.34
		O-N3-4		144580.15	564941.38	
		O-N3-5		144572.24	564942.35	
		O-N3-9		144602.21	564947.08	
		O-N3-11		144588.63	564948.37	
		N4		O-N4-3	144589.40	564956.52
				O-N4-4	144582.47	564957.07
				O-N4-7	144561.68	564958.74
				O-N4-9	144605.01	564963.79
				O-N4-12	144585.34	564965.37
				O-N4-13	144578.83	564965.89
			N5	O-N5-1	144602.87	564970.68
				O-N5-2	144590.34	564971.67
		O-N5-5		144604.01	564975.23	
		O-N5-7		144580.23	564977.22	
		O-N5-13		144606.18	564985.19	
		O-N5-15		144584.48	564986.84	
		N6		O-N6-1	144607.11	564990.38
				O-N6-10	144606.66	565002.18
			O-N6-12	144605.72	565008.54	
			O-N6-13	144594.17	565002.24	
			O-N6-15	144594.78	565006.62	
			O-N6-16	144583.55	565009.32	
	15		O7	O-O7-1	144536.99	564945.34
				O-O7-3	144525.42	564955.90
		O-O7-4		144521.86	564959.11	
		O-O7-5		144519.49	564962.74	
		O-O7-8		144509.53	564983.92	
		O-O7-11		144533.02	564981.19	
		O8		O-O8-2	144543.02	564962.11
				O-O8-3	144539.16	564967.02
				O-O8-4	144535.20	564972.08
				O-O8-8	144518.20	564993.97
				O-O8-12	144539.39	564981.36
				O-O8-13	144535.53	564986.19
			O9	O-O9-3	144539.86	564992.41
				O-O9-4	144532.82	565001.69
		O-O9-5		144556.21	564978.42	
		O-O9-10		144553.48	564991.83	
		O-O9-14		144557.13	564996.56	
		O-O9-16		144545.57	565011.88	
		O10		O-O10-3	144555.98	565008.33
				O-O10-4	144550.51	565015.57
			O-O10-8	144555.84	565019.66	
			O-O10-10	144570.50	565012.83	
			O-O10-14	144573.87	565021.47	
			O-O10-16	144569.37	565031.57	
16			P1	O-P1-2	144507.29	565004.97
				O-P1-3	144515.31	565002.62
		O-P1-4		144508.33	565009.66	
		O-P1-10		144526.10	565015.95	
		O-P1-13		144537.56	565016.58	
		O-P1-16		144521.94	565032.02	
		P2		O-P2-3	144531.98	565032.15
				O-P2-6	144542.64	565031.15
				O-P2-7	144536.39	565037.30
				O-P2-10	144547.28	565035.43
				O-P2-14	144551.44	565039.62
				O-P2-15	144544.38	565046.62
			P3	O-P3-1	144563.43	565036.02
				O-P3-2	144555.76	565043.19
		O-P3-4		144540.98	565058.20	
		O-P3-5		144567.73	565039.35	
		O-P3-9		144569.69	565042.56	
		O-P3-11		144554.41	565059.54	
		P4		O-P4-3	144558.06	565073.00
				O-P4-4	144553.69	565078.85
			O-P4-7	144569.75	565069.32	
			O-P4-9	144576.76	565063.36	
			O-P4-12	144576.33	565088.78	
			O-P4-13	144583.39	565055.15	
	17		Q5	O-Q5-1	144506.28	565017.51
				O-Q5-2	144503.03	565021.82
		O-Q5-5		144517.55	565036.29	
		O-Q5-7		144509.89	565041.23	
		O-Q5-13		144526.59	565053.43	
		O-Q5-15		144513.06	565062.44	
		Q6		O-Q6-1	144529.99	565058.88
				O-Q6-10	144527.85	565074.73
				O-Q6-12	144510.51	565085.56
				O-Q6-13	144539.70	565073.89
				O-Q6-15	144526.59	565083.80
				O-Q6-16	144518.09	565087.18
			Q7	O-Q7-1	144546.76	565079.71
				O-Q7-3	144536.65	565086.73
		O-Q7-4		144532.05	565090.22	
		O-Q7-5		144548.24	565089.32	
		O-Q7-8		144477.49	565105.37	
		O-Q7-11		144480.40	565112.97	
		Q8		O-Q8-2	144488.23	565131.66
				O-Q8-3	144482.55	565131.70
			O-Q8-4	144476.44	565131.74	
			O-Q8-8	144478.00	565142.23	
			O-Q8-12	144482.77	565156.65	
			O-Q8-13	144492.47	565163.17	
18			R9	O-R9-3	144528.50	565101.20
				O-R9-4	144523.55	565101.14
		O-R9-5		144518.96	565100.84	
		O-R9-10		144535.89	565111.91	
		O-R9-14		144511.73	565111.78	
		O-R9-16		144499.77	565111.72	
		R10		O-R10-3	144529.78	565121.33
				O-R10-4	144523.75	565121.32
				O-R10-8	144499.75	565121.28
				O-R10-10	144535.87	565130.88
				O-R10-14	144511.87	565130.84
				O-R10-16	144499.79	565130.82
			R1	O-R1-2	144535.74	565140.46
				O-R1-3	144529.75	565140.44
		O-R1-4		144523.76	565140.42	
		O-R1-10		144535.62	565150.03	
		O-R1-13		144517.67	565149.97	
		O-R1-16		144499.78	565149.90	
		R2		O-R2-3	144529.59	565159.61
				O-R2-6	144511.69	565159.54
			O-R2-7	144505.72	565159.52	
			O-R2-10	144534.64	565168.92	
			O-R2-14	144510.55	565169.48	
			O-R2-15	144504.97	565169.56	

1. SEE ATTACHMENT 3 SHEETS 5, 6, 7, 8, AND 9 OF 14 FOR OVERBURDEN SAMPLING PLAN.

Attachment 3 Sheet No. 12 of 14
Originator G. CREUZ Date 7/23/06
Chkd By CLB Date 7/27/06
Calc. No. 0100B-CA-V0285 Rev. No. 10

ATTACHMENT 3

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

100-B/C AREA
100-B-14:1 PROCESS AND SANITARY
SEWER PIPELINES - OVERBURDEN
SAMPLE DESIGN COORDINATE TABLE - 2

18C:071906D					SAMPLE LOCATION TABLE					NOTES																																																																																																																																																																													
<table><tr><th>DECISION SUBUNIT</th><th>SAMPLING AREA</th><th>SAMPLE NODE</th><th>NORTHING</th><th>EASTING</th></tr><tr><td rowspan="36">19</td><td rowspan="6">S3</td><td>O-S3-1</td><td>144569.80</td><td>565120.11</td></tr><tr><td>O-S3-2</td><td>144559.92</td><td>565119.02</td></tr><tr><td>O-S3-4</td><td>144561.46</td><td>565126.45</td></tr><tr><td>O-S3-5</td><td>144552.49</td><td>565112.71</td></tr><tr><td>O-S3-9</td><td>144575.37</td><td>565132.57</td></tr><tr><td>O-S3-11</td><td>144557.40</td><td>565132.52</td></tr><tr><td rowspan="6">S4</td><td>O-S4-3</td><td>144558.07</td><td>565145.44</td></tr><tr><td>O-S4-4</td><td>144549.18</td><td>565145.45</td></tr><tr><td>O-S4-7</td><td>144557.88</td><td>565151.87</td></tr><tr><td>O-S4-9</td><td>144575.09</td><td>565158.48</td></tr><tr><td>O-S4-12</td><td>144548.86</td><td>565158.40</td></tr><tr><td>O-S4-13</td><td>144574.18</td><td>565165.22</td></tr><tr><td rowspan="6">S5</td><td>O-S5-1</td><td>144550.28</td><td>565170.88</td></tr><tr><td>O-S5-2</td><td>144561.98</td><td>565171.04</td></tr><tr><td>O-S5-5</td><td>144636.15</td><td>565181.20</td></tr><tr><td>O-S5-7</td><td>144649.32</td><td>565181.30</td></tr><tr><td>O-S5-13</td><td>144636.87</td><td>565198.84</td></tr><tr><td>O-S5-15</td><td>144649.95</td><td>565199.46</td></tr><tr><td rowspan="8">S6</td><td>O-S6-1</td><td>144663.02</td><td>565178.45</td></tr><tr><td>O-S6-10</td><td>144677.69</td><td>565193.67</td></tr><tr><td>O-S6-12</td><td>144682.85</td><td>565195.84</td></tr><tr><td>O-S6-13A</td><td>144679.14</td><td>565200.24</td></tr><tr><td>O-S6-13B</td><td>144963.58</td><td>565286.64</td></tr><tr><td>O-S6-15</td><td>144963.50</td><td>565297.56</td></tr><tr><td>O-S6-16</td><td>144963.43</td><td>565303.03</td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table>					DECISION SUBUNIT	SAMPLING AREA	SAMPLE NODE	NORTHING	EASTING	19	S3	O-S3-1	144569.80	565120.11	O-S3-2	144559.92	565119.02	O-S3-4	144561.46	565126.45	O-S3-5	144552.49	565112.71	O-S3-9	144575.37	565132.57	O-S3-11	144557.40	565132.52	S4	O-S4-3	144558.07	565145.44	O-S4-4	144549.18	565145.45	O-S4-7	144557.88	565151.87	O-S4-9	144575.09	565158.48	O-S4-12	144548.86	565158.40	O-S4-13	144574.18	565165.22	S5	O-S5-1	144550.28	565170.88	O-S5-2	144561.98	565171.04	O-S5-5	144636.15	565181.20	O-S5-7	144649.32	565181.30	O-S5-13	144636.87	565198.84	O-S5-15	144649.95	565199.46	S6	O-S6-1	144663.02	565178.45	O-S6-10	144677.69	565193.67	O-S6-12	144682.85	565195.84	O-S6-13A	144679.14	565200.24	O-S6-13B	144963.58	565286.64	O-S6-15	144963.50	565297.56	O-S6-16	144963.43	565303.03						<table><tr><th>DECISION SUBUNIT</th><th>SAMPLING AREA</th><th>SAMPLE NODE</th><th>NORTHING</th><th>EASTING</th></tr><tr><td rowspan="24">22</td><td rowspan="6">V5</td><td>O-V5-1</td><td>145211.96</td><td>565279.22</td></tr><tr><td>O-V5-2</td><td>145205.69</td><td>565279.23</td></tr><tr><td>O-V5-5</td><td>145211.83</td><td>565288.22</td></tr><tr><td>O-V5-7</td><td>145198.87</td><td>565288.20</td></tr><tr><td>O-V5-13</td><td>145211.51</td><td>565305.37</td></tr><tr><td>O-V5-15</td><td>145197.90</td><td>565306.09</td></tr><tr><td rowspan="6">V6</td><td>O-V6-1</td><td>145239.67</td><td>565277.26</td></tr><tr><td>O-V6-10</td><td>145232.49</td><td>565294.32</td></tr><tr><td>O-V6-12</td><td>145218.66</td><td>565294.32</td></tr><tr><td>O-V6-13</td><td>145238.91</td><td>565302.06</td></tr><tr><td>O-V6-15</td><td>145224.34</td><td>565303.07</td></tr><tr><td>O-V6-16</td><td>145218.12</td><td>565303.60</td></tr><tr><td rowspan="6">V7</td><td>O-V7-1</td><td>145270.25</td><td>565276.49</td></tr><tr><td>O-V7-3</td><td>145254.35</td><td>565276.26</td></tr><tr><td>O-V7-4</td><td>145246.70</td><td>565276.23</td></tr><tr><td>O-V7-5</td><td>145270.40</td><td>565283.68</td></tr><tr><td>O-V7-8</td><td>145246.79</td><td>565283.57</td></tr><tr><td>O-V7-11</td><td>145254.69</td><td>565290.87</td></tr><tr><td rowspan="6">V8</td><td>O-V8-2</td><td>145300.27</td><td>565274.67</td></tr><tr><td>O-V8-3</td><td>145290.44</td><td>565275.81</td></tr><tr><td>O-V8-4</td><td>145279.64</td><td>565275.86</td></tr><tr><td>O-V8-8</td><td>145279.66</td><td>565281.31</td></tr><tr><td>O-V8-12</td><td>145279.49</td><td>565286.76</td></tr><tr><td>O-V8-13</td><td>145306.30</td><td>565292.30</td></tr></table>					DECISION SUBUNIT	SAMPLING AREA	SAMPLE NODE	NORTHING	EASTING	22	V5	O-V5-1	145211.96	565279.22	O-V5-2	145205.69	565279.23	O-V5-5	145211.83	565288.22	O-V5-7	145198.87	565288.20	O-V5-13	145211.51	565305.37	O-V5-15	145197.90	565306.09	V6	O-V6-1	145239.67	565277.26	O-V6-10	145232.49	565294.32	O-V6-12	145218.66	565294.32	O-V6-13	145238.91	565302.06	O-V6-15	145224.34	565303.07	O-V6-16	145218.12	565303.60	V7	O-V7-1	145270.25	565276.49	O-V7-3	145254.35	565276.26	O-V7-4	145246.70	565276.23	O-V7-5	145270.40	565283.68	O-V7-8	145246.79	565283.57	O-V7-11	145254.69	565290.87	V8	O-V8-2	145300.27	565274.67	O-V8-3	145290.44	565275.81	O-V8-4	145279.64	565275.86	O-V8-8	145279.66	565281.31	O-V8-12	145279.49	565286.76	O-V8-13	145306.30	565292.30	1. SEE ATTACHMENT 3 SHEETS 5, 6, 7, 8, AND 9 OF 14 FOR OVERBURDEN SAMPLING PLAN.	
DECISION SUBUNIT	SAMPLING AREA	SAMPLE NODE	NORTHING	EASTING																																																																																																																																																																																			
19	S3	O-S3-1	144569.80	565120.11																																																																																																																																																																																			
		O-S3-2	144559.92	565119.02																																																																																																																																																																																			
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	S6	O-S6-1	144663.02	565178.45																																																																																																																																																																																			
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		O-S6-13B	144963.58	565286.64																																																																																																																																																																																			
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	DECISION SUBUNIT	SAMPLING AREA	SAMPLE NODE	NORTHING	EASTING																																																																																																																																																																																		
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		O-V7-3	145254.35	565276.26																																																																																																																																																																																			
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		O-V8-13	145306.30	565292.30																																																																																																																																																																																			
<table><tr><td rowspan="36">20</td><td rowspan="6">T7</td><td>O-T7-1</td><td>145000.40</td><td>565281.54</td></tr><tr><td>O-T7-3</td><td>144985.63</td><td>565282.87</td></tr><tr><td>O-T7-4</td><td>144975.19</td><td>565283.63</td></tr><tr><td>O-T7-5</td><td>144999.20</td><td>565289.80</td></tr><tr><td>O-T7-8</td><td>144973.44</td><td>565289.79</td></tr><tr><td>O-T7-11</td><td>144981.97</td><td>565296.40</td></tr><tr><td rowspan="6">T8</td><td>O-T8-2</td><td>145020.95</td><td>565280.40</td></tr><tr><td>O-T8-3</td><td>145013.88</td><td>565280.42</td></tr><tr><td>O-T8-4</td><td>145006.98</td><td>565280.39</td></tr><tr><td>O-T8-8</td><td>145007.23</td><td>565288.43</td></tr><tr><td>O-T8-12</td><td>145007.26</td><td>565296.16</td></tr><tr><td>O-T8-13</td><td>145029.80</td><td>565304.32</td></tr><tr><td rowspan="6">T9</td><td>O-T9-3</td><td>145044.13</td><td>565282.29</td></tr><tr><td>O-T9-4</td><td>145036.74</td><td>565282.32</td></tr><tr><td>O-T9-5</td><td>145058.56</td><td>565290.11</td></tr><tr><td>O-T9-10</td><td>145051.31</td><td>565297.94</td></tr><tr><td>O-T9-14</td><td>145052.08</td><td>565306.04</td></tr><tr><td>O-T9-16</td><td>145037.13</td><td>565305.57</td></tr><tr><td rowspan="6">T10</td><td>O-T10-3</td><td>145072.91</td><td>565281.87</td></tr><tr><td>O-T10-4</td><td>145065.81</td><td>565281.78</td></tr><tr><td>O-T10-8</td><td>145065.75</td><td>565289.91</td></tr><tr><td>O-T10-10</td><td>145079.70</td><td>565298.25</td></tr><tr><td>O-T10-14</td><td>145079.67</td><td>565306.47</td></tr><tr><td>O-T10-16</td><td>145065.78</td><td>565306.30</td></tr></table>					20	T7	O-T7-1	145000.40	565281.54	O-T7-3	144985.63	565282.87	O-T7-4	144975.19	565283.63	O-T7-5	144999.20	565289.80	O-T7-8	144973.44	565289.79	O-T7-11	144981.97	565296.40	T8	O-T8-2	145020.95	565280.40	O-T8-3	145013.88	565280.42	O-T8-4	145006.98	565280.39	O-T8-8	145007.23	565288.43	O-T8-12	145007.26	565296.16	O-T8-13	145029.80	565304.32	T9	O-T9-3	145044.13	565282.29	O-T9-4	145036.74	565282.32	O-T9-5	145058.56	565290.11	O-T9-10	145051.31	565297.94	O-T9-14	145052.08	565306.04	O-T9-16	145037.13	565305.57	T10	O-T10-3	145072.91	565281.87	O-T10-4	145065.81	565281.78	O-T10-8	145065.75	565289.91	O-T10-10	145079.70	565298.25	O-T10-14	145079.67	565306.47	O-T10-16	145065.78	565306.30	<table><tr><td rowspan="36">21</td><td rowspan="6">U1</td><td>O-U1-2</td><td>145107.82</td><td>565280.15</td></tr><tr><td>O-U1-3</td><td>145101.35</td><td>565280.76</td></tr><tr><td>O-U1-4</td><td>145094.10</td><td>565281.28</td></tr><tr><td>U1-10</td><td>145106.47</td><td>565298.41</td></tr><tr><td>O-U1-13</td><td>145113.16</td><td>565307.57</td></tr><tr><td>O-U1-16</td><td>145093.51</td><td>565306.92</td></tr><tr><td rowspan="6">U2</td><td>O-U2-3</td><td>145125.27</td><td>565279.75</td></tr><tr><td>O-U2-6</td><td>145131.73</td><td>565289.05</td></tr><tr><td>O-U2-7</td><td>145125.55</td><td>565289.09</td></tr><tr><td>O-U2-10</td><td>145131.72</td><td>565298.30</td></tr><tr><td>O-U2-14</td><td>145131.53</td><td>565307.50</td></tr><tr><td>O-U2-15</td><td>145125.41</td><td>565307.64</td></tr><tr><td rowspan="6">U3</td><td>O-U3-1</td><td>145161.24</td><td>565278.89</td></tr><tr><td>O-U3-2</td><td>145155.16</td><td>565278.77</td></tr><tr><td>O-U3-4</td><td>145144.15</td><td>565279.37</td></tr><tr><td>O-U3-5</td><td>145161.61</td><td>565288.86</td></tr><tr><td>O-U3-9</td><td>145161.62</td><td>565298.56</td></tr><tr><td>O-U3-11</td><td>145149.86</td><td>565298.74</td></tr><tr><td rowspan="6">U4</td><td>O-U4-3</td><td>145174.06</td><td>565280.13</td></tr><tr><td>O-U4-4</td><td>145167.82</td><td>565280.19</td></tr><tr><td>O-U4-7</td><td>145173.80</td><td>565289.50</td></tr><tr><td>O-U4-9</td><td>145185.87</td><td>565298.90</td></tr><tr><td>O-U4-12</td><td>145167.71</td><td>565298.81</td></tr><tr><td>O-U4-13</td><td>145185.42</td><td>565307.88</td></tr></table>					21	U1	O-U1-2	145107.82	565280.15	O-U1-3	145101.35	565280.76	O-U1-4	145094.10	565281.28	U1-10	145106.47	565298.41	O-U1-13	145113.16	565307.57	O-U1-16	145093.51	565306.92	U2	O-U2-3	145125.27	565279.75	O-U2-6	145131.73	565289.05	O-U2-7	145125.55	565289.09	O-U2-10	145131.72	565298.30	O-U2-14	145131.53	565307.50	O-U2-15	145125.41	565307.64	U3	O-U3-1	145161.24	565278.89	O-U3-2	145155.16	565278.77	O-U3-4	145144.15	565279.37	O-U3-5	145161.61	565288.86	O-U3-9	145161.62	565298.56	O-U3-11	145149.86	565298.74	U4	O-U4-3	145174.06	565280.13	O-U4-4	145167.82	565280.19	O-U4-7	145173.80	565289.50	O-U4-9	145185.87	565298.90	O-U4-12	145167.71	565298.81	O-U4-13	145185.42	565307.88																				
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		O-T9-5	145058.56	565290.11																																																																																																																																																																																			
		O-T9-10	145051.31	565297.94																																																																																																																																																																																			
		O-T9-14	145052.08	565306.04																																																																																																																																																																																			
		O-T9-16	145037.13	565305.57																																																																																																																																																																																			
	T10	O-T10-3	145072.91	565281.87																																																																																																																																																																																			
		O-T10-4	145065.81	565281.78																																																																																																																																																																																			
		O-T10-8	145065.75	565289.91																																																																																																																																																																																			
		O-T10-10	145079.70	565298.25																																																																																																																																																																																			
		O-T10-14	145079.67	565306.47																																																																																																																																																																																			
		O-T10-16	145065.78	565306.30																																																																																																																																																																																			
	21	U1	O-U1-2	145107.82		565280.15																																																																																																																																																																																	
			O-U1-3	145101.35		565280.76																																																																																																																																																																																	
			O-U1-4	145094.10		565281.28																																																																																																																																																																																	
			U1-10	145106.47		565298.41																																																																																																																																																																																	
			O-U1-13	145113.16		565307.57																																																																																																																																																																																	
			O-U1-16	145093.51		565306.92																																																																																																																																																																																	
		U2	O-U2-3	145125.27		565279.75																																																																																																																																																																																	
			O-U2-6	145131.73		565289.05																																																																																																																																																																																	
			O-U2-7	145125.55		565289.09																																																																																																																																																																																	
			O-U2-10	145131.72		565298.30																																																																																																																																																																																	
			O-U2-14	145131.53		565307.50																																																																																																																																																																																	
			O-U2-15	145125.41	565307.64																																																																																																																																																																																		
U3		O-U3-1	145161.24	565278.89																																																																																																																																																																																			
		O-U3-2	145155.16	565278.77																																																																																																																																																																																			
		O-U3-4	145144.15	565279.37																																																																																																																																																																																			
		O-U3-5	145161.61	565288.86																																																																																																																																																																																			
		O-U3-9	145161.62	565298.56																																																																																																																																																																																			
		O-U3-11	145149.86	565298.74																																																																																																																																																																																			
U4		O-U4-3	145174.06	565280.13																																																																																																																																																																																			
		O-U4-4	145167.82	565280.19																																																																																																																																																																																			
		O-U4-7	145173.80	565289.50																																																																																																																																																																																			
		O-U4-9	145185.87	565298.90																																																																																																																																																																																			
		O-U4-12	145167.71	565298.81																																																																																																																																																																																			
		O-U4-13	145185.42	565307.88																																																																																																																																																																																			

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVIER CORRIDOR CLOSURE CONTRACT

100-B/C AREA
100-B-14:1 PROCESS AND SANITARY
SEWER PIPELINES - OVERBURDEN
SAMPLE DESIGN COORDINATE TABLE - 3

Attachment 3

Originator G. C. R. W.

Chk'd By CSB

Calc. No. 010003-CA-V0285

Sheet No. 13 of 14

Date 7/23/06

Date 7/27/06

Rev. No. 18

ATTACHMENT 3

1BC:071906A

NOTES

1. ALL ELEVATIONS SHOWN ARE REFERENCED TO NAVD88 VERTICAL DATUM.
2. THE DEEP ZONE WAS DETERMINED BY COMPARING THE BOTTOM OF EXCAVATION SURVEY DATA TO THE PRE-EXCAVATION SURVEY TOPOGRAPHY. IF THE DIFFERENCE WAS APPROXIMATELY 4.57 METERS (15 FT.), A DEEP ZONE WAS ESTABLISHED.
3. PRE & POST (BOTTOM EXCAVATION) SURVEY PROVIDED BY FEDERAL ENGINEERS AND CONTRACTORS

SCALE 1:1750
17.5 0 17.5 35 70 meters

Attachment 3
Originator G.C.R.M.
Chkd By C.B.S.
Calc. No. 000B-CA-V02B5

Sheet No. 14 of 14
Date 7/23/06
Date 7/27/06
Rev. No. 10

ATTACHMENT 3

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVIER CORRIDOR CLOSURE CONTRACT

100-B/C AREA
100-B-14:1 PROCESS AND SANITARY
SEWER PIPELINES (PHASE 1 AND 2)
PIPELINE EXCAVATION ALIGNMENT PROFILE

CALCULATION COVER SHEET

Project Title:	100-B-14:1 Process and Sanitary Sewer Pipelines		Job No.	14655
	Overburden Sample Design			
Area	100-B/C			
Discipline	Environmental Engineering	*Calc. No.	0100B-CA-V0297	
Subject	100-B-14:1 Overburden 1,2,3,4,5, and 6 Phase 3 Sampling Plan			
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 Sht Calc = 4 Shts Attach1 = 1 Sht Attach2 = 1 Sht Attach3 = 7 Shts Total = 14 Shts	G. Cruz 11/07/06	C.A. Bentz 11/07/06	C.R. Martinez 11/09/06	D.N. Strom 11-9-06	11-9-06
SUMMARY OF REVISIONS						

WCH-DE-018 (9/01/2006)

*Obtain Calc. No. from R&DC and Form from Intranet

CALCULATION SHEET

[illegible]

CALCULATION SHEET

[illegible]

CALCULATION SHEET

[illegible]

Washington Closure Hanford

Originator G. Cruz Date 11/7/2006 Calc. No. 0100B-CA-V0297 Rev. No. 0
 Project 100-B-14:1 Process and Sanitary Sewer
Pipelines Overburden Sample Design Job No. 14655 Checked AB Date 11/07/06
 Subject 100-B-14:1 Overburden 1,2,3,4,5, and 6 Phase 3 Sampling Plan Sheet No 1 of 1

1 ATTACHMENT 1

3 Sample Grid Point Lookup Table.

Default Plan	Sampling Area 1	Sampling Area 2	Sampling Area 3	Sampling Area 4	Sampling Area 5	Sampling Area 6	Sampling Area 7	Sampling Area 8	Sampling Area 9	Sampling Area 10
Variance/Verification	3	6	1	4	5	1	3	3	4	16
Variance/Verification	4	7	11	3	15	15	5	13	10	10
Variance/Verification	16	3	2	7	7	10	11	4	3	14
Variance/Verification	10	15	4	12	1	13	4	8	16	4
Variance	2	14	5	9	13	12	8	2	14	8
Variance	13	10	9	13	2	16	1	12	5	3
Not Sampling	6	1	10	8	14	4	16	5	8	6
Not Sampling	1	9	13	1	10	5	12	1	1	15
Not Sampling	9	12	7	5	6	2	6	7	15	9
Not Sampling	15	16	15	14	16	6	2	15	11	1
Not Sampling	8	13	8	10	12	11	13	14	2	12
Not Sampling	5	2	3	11	4	3	9	10	7	11
Not Sampling	7	11	14	15	11	14	14	6	13	2
Not Sampling	11	4	6	2	9	7	7	11	9	7
Not Sampling	12	8	16	16	3	8	15	9	6	13
Not Sampling	14	5	12	6	8	9	10	16	12	5

** Note: Grid nodes for each sampling area in each waste site should be numbered consistently, e.g., begin numbering the nodes in the northwestern-most node, then number consecutively left to right.

Washington Closure Hanford

Originator G. Cruz Date 11/7/2006 Calc. No. 0100B-CA-V0297 Rev. No. 0
 Project 100-B-14:1 Process and Sanitary Sewer
Pipelines Overburden Sample Design Job No. 14655 Checked AB Date 11/07/06
 Subject 100-B-14:1 Overburden 1,2,3,4,5, and 6 Phase 3 Sampling Plan Sheet No. 1 of 1

1 ATTACHMENT 2

2

3 Number of Decision Subunits Based on Area.

4

5

Area of Primary Decision Unit (m2)	Number of Subunits
<1,394	1
>1,394 to <2,326	2
>2,326 to <3,256	3
>3,256 to <4,186	4
>4,186 to <9,303	2
>9,303 to <13,024	3
>13,024 to <16,745	4
>16,745 to <20,466	5
>20,466	ROUNDa (Area/3,720)

16 a ROUND is an integer rounding function.

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NOTES		SAMPLE LOCATION TABLE				
<p>1. OVERBURDEN NODE AREAS ARE APPROXIMATELY 67.26 SQUARE METERS.</p> <p>2. SAMPLES ARE TAKEN FROM THE APPROXIMATE CENTER OF EACH NODE.</p> <p>3. THE OVERBURDEN CONSISTS OF SAMPLING AREAS A1, A2, A3, AND A4 WITHIN DECISION SUBUNIT 1. AREAS B5, B6, B7, AND B8 WITHIN DECISION SUBUNIT 2.</p>		DECISION SUBUNIT	SAMPLING AREA	SAMPLE NODE	NORTHING	EASTING
1	A1	O-A1-3	144658.14	565178.60		
		O-A1-4	144650.28	565178.27		
		O-A1-10	144671.59	565192.43		
		O-A1-16	144650.28	565200.20		
	A2	O-A2-3	144642.91	565189.14		
		O-A2-6A	144636.00	565198.46		
		O-A2-6B	144570.78	565172.21		
		O-A2-7	144575.41	565165.52		
	A3	O-A2-15	144575.25	565125.89		
		O-A3-1	144561.44	565119.46		
		O-A3-2	144554.55	565117.48		
		O-A3-4	144547.61	565119.36		
	A4	O-A3-11	144545.32	565128.13		
		O-A4-3	144545.17	565144.56		
		O-A4-4	144537.09	565144.56		
		O-A4-7	144545.31	565152.78		
2	B5	O-A4-12	144537.09	565161.06		
		O-B5-1	144530.38	565101.82		
		O-B5-5	144509.62	565102.24		
		O-B5-7	144492.00	565104.95		
	B6	O-B5-15	144482.27	565112.83		
		O-B6-1	144529.35	565121.28		
		O-B6-10	144521.90	565130.27		
		O-B6-13	144499.61	565130.39		
	B7	O-B6-15	144484.85	565130.48		
		O-B7-3	144515.17	565139.51		
		O-B7-4	144507.98	565139.55		
		O-B7-5	144500.77	565139.59		
	B8	O-B7-11	144515.46	565148.97		
		O-B8-3	144516.06	565158.72		
		O-B8-4	144509.29	565168.78		
		O-B8-8	144481.91	565158.99		
O-B8-13	144503.88	565169.22				

1BC:082906F

E 565075

N 144660

These s/b be marked as verification sampling nodes.

11/09/06

SCALE 1:1000

10 0 10 20 40 meters

U.S DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

Attachment 3
Originator: G. CRUZ
Chkd By: CAB
Calc. No. 0100B-CA-VD297

Sheet No. 6 of 7
Date: 11/07/06
Date: 11/07/06
Rev. No. 107

ATTACHMENT 3

100-B/C AREA
100-B-14:1 PROCESS AND SANITARY
SEWER PIPELINES
OVERBURDEN 6 PHASE 3 SAMPLING PLAN

1BC:082906G

SAMPLE LOCATION TABLE

DECISION SUBUNIT	SAMPLING AREA	SAMPLE NODE	NORTHING	EASTING	
1	A1	O-A1-3	145096.09	565156.36	
		O-A1-4	145096.25	565164.51	
		O-A1-10	145089.42	565141.78	
		O-A1-16	145089.71	565198.22	
		O-A2-3	145083.44	565151.21	
	A2	O-A2-6	145083.57	565179.80	
		O-A2-7	145083.61	565189.20	
		O-A2-15	145077.61	565188.68	
		O-A3-1	145071.44	565130.82	
		O-A3-2	145071.49	565140.81	
	A3	O-A3-4	145071.58	565160.41	
		O-A3-11	145065.64	565149.66	
		A4	O-A4-3	145059.83	565150.41
			O-A4-4	145059.88	565160.33
	O-A4-7		145060.01	565189.73	
	O-A4-12		145054.06	565159.84	
	2	B5	O-B5-1	145048.18	565130.95
			O-B5-5	145048.29	565170.86
			O-B5-7	145048.34	565190.23
			O-B5-15	145042.57	565189.80
O-B6-1			145036.76	565129.63	
B6		O-B6-10	145031.47	565140.10	
		O-B6-13	145031.65	565172.22	
		O-B6-15	145031.77	565193.78	
		O-B7-3	145025.95	565149.05	
		O-B7-4	145025.99	565158.95	
B7		O-B7-5	145026.03	565168.79	
		O-B7-11	145019.99	565147.00	
		B8	O-B8-3	145013.77	565148.61
			O-B8-4	145013.64	565157.63
O-B8-8			145013.34	565191.38	
O-B8-13			145006.21	565161.51	
3		C9	O-C9-3	144987.23	565121.47
			O-C9-4	144978.64	565115.57
			O-C9-10	144970.70	565115.69
			O-C9-16	144955.71	565109.70
	O-C10-4		144950.61	565103.76	
	C10	O-C10-10	144969.77	565082.09	
		O-C10-14	144948.33	565087.48	
		O-C10-16	144937.46	565090.19	
		O-C1-3	144996.82	565168.16	
		O-C1-4	144995.38	565173.67	
	C1	O-C1-10	144990.06	565145.46	
		O-C1-16	144976.13	565154.08	
		C2	O-C2-3	144972.57	565144.16
			O-C2-6	144968.51	565135.43
	O-C2-7		144964.76	565141.72	
	O-C2-15		144949.74	565134.17	
	4	D3	O-D3-1	144944.37	565121.91
			O-D3-2	144939.75	565115.60
			O-D3-4	144931.87	565105.20
			O-D3-11	144929.73	565116.77
O-D4-3			144904.10	565074.02	
D4		O-D4-4	144900.43	565067.65	
		O-D4-7	144891.42	565054.76	
		O-D4-12	144892.43	565074.14	
		O-D5-1	144887.86	565043.02	
		O-D5-5	144883.44	565035.94	
D5		O-D5-7	144872.84	565044.07	
		O-D5-15	144863.31	565031.56	
		D6	O-D6-1	144870.74	565016.86
			O-D6-10	144852.56	565011.78
O-D6-13			144850.84	565005.35	
O-D6-15			144838.30	565011.25	

DECISION SUBUNIT	SAMPLING AREA	SAMPLE NODE	NORTHING	EASTING	
5	E7	O-E7-3	144976.02	565034.01	
		O-E7-4	144975.80	565042.03	
		O-E7-5	144976.30	565049.81	
		O-E7-11	144968.45	565034.80	
		O-E8-3	144961.10	565035.65	
	E8	O-E8-4	144961.09	565043.59	
		O-E8-8	144961.04	565075.51	
		O-E8-13	144953.93	565052.00	
		O-E9-3	144947.01	565036.64	
		O-E9-4	144947.00	565045.02	
	E9	O-E9-10	144940.23	565028.19	
		O-E9-16	144940.16	565079.92	
		E10	O-E10-4	144933.52	565045.56
			O-E10-10	144925.78	565025.28
	O-E10-14		144926.26	565052.82	
	O-E10-16		144927.39	565073.47	
	6	F1	O-F1-3	144981.30	564967.45
			O-F1-4	144979.01	564975.14
			O-F1-10	144971.69	564966.99
			O-F1-16	144971.56	565011.92
O-F2-3			144963.96	564974.44	
F2		O-F2-6	144963.99	564996.85	
		O-F2-7	144964.00	565004.36	
		O-F2-15	144956.34	565004.51	
		O-F3-1	144948.60	564959.50	
		O-F3-2	144948.61	564966.92	
F3		O-F3-4	144948.63	564981.80	
		O-F3-11	144940.95	564974.56	
		F4	O-F4-3	144933.29	564974.24
			O-F4-4	144933.30	564981.69
O-F4-7			144933.33	565004.16	
O-F4-12			144925.72	564982.06	
7		G5	O-G5-1	144986.15	564910.79
			O-G5-5	144986.71	564936.02
			O-G5-7	144986.84	564947.21
			O-G5-15	144977.28	564946.16
	O-G6-1		144968.43	564905.77	
	G6	O-G6-10	144959.99	564911.37	
		O-G6-13	144960.08	564931.84	
		O-G6-15	144960.14	564945.54	
		O-G7-3	144951.87	564916.03	
		O-G7-4	144951.91	564923.30	
	G7	O-G7-5	144951.94	564930.56	
		O-G7-11	144943.93	564916.21	
		G8	O-G8-3	144935.80	564917.71
			O-G8-4	144935.83	564924.65
	O-G8-8		144936.00	564952.30	
	O-G8-13		144926.79	564935.03	

NOTES

1. SEE ATTACHMENT 3 SHEET 3 OF 7 FOR OVERBURDEN SAMPLING PLAN.

Attachment 3 Sheet No. 7 of 7
Originator G. J. R. V. L. Date 11/07/06
Chkd By JB Date 11/07/06
Calc. No. 61003-CA-V0297 Rev. No. 0

ATTACHMENT 3

U.S DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVIER CORRIDOR CLOSURE CONTRACT

100-B/C AREA
100-B-14:1 PROCESS AND SANITARY
SEWER PIPELINES - OVERBURDEN
SAMPLE DESIGN LOCATION TABLE

CALCULATION COVER SHEET

Project Title: 100-B/C Pipelines Field Remediation **Job No.** 14655
Area 100-B/C
Discipline Environmental ***Calc. No.** 0100B-CA-V0286
Subject 100-B-14:1 Shallow Zone and Overburden Variance Calculations
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 Sheets = 14 Total = 15	<i>J. M. Capron</i> 7/31/06 J. M. Capron	<i>T. M. Blakley</i> 8/1/06 T. M. Blakley	<i>L. M. Dittmer</i> 8/1/06 L. M. Dittmer	<i>D. N. Strom</i> D. N. Strom	8-1-06

SUMMARY OF REVISIONS

WCH-DE-018 (4/14/06)

* Obtain Calc No. from R&DC and Form from Intranet

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron *JMC* Date 07/31/06
 Project 100-B/C Pipelines Field Remediation Job No. 14655
 Subject 100-B-14:1 Shallow Zone and Overburden Variance Calculations

Calc. No. 0100B-CA-V0286 Rev. No. 0
 Checked T. M. Blakley *TMB* Date 7/1/06
 Sheet No. 1 of 14

1 Summary

2 Conclusion:

3 The required number of samples calculated (1) for each decision subunit is less than the default number (4) specified in DOE-RL (2005a).
 4 Therefore, the default number of samples will be collected from each shallow zone and overburden decision subunit. The default number of
 5 samples (3) will be collected from each deep zone decision subunit (DOE-RL [2005a]).

7 Problem:

8 Calculate the number of verification samples required for the 100-B-14:1 pipeline excavation shallow zone and overburden decision units as
 9 required by DOE-RL (2005a) and BHI (2003).

11 Given/References:

- 12 1) Sample locations for the 100-B-14:1 pipeline excavation and associated overburden are identified in WCH, 2006a, *100-B-14:1 Pipelines*
 13 *Shallow, Deep, and Overburden Sample Design*, 0100B-CA-V0285, Rev. 0, Washington Closure Hanford, Richland, Washington.
 14 2) Sample Design requirements from DOE-RL, 2005a, *100 Area Remedial Action Sampling and Analysis Plan*, DOE/RL-96-22, Rev. 4,
 15 U.S. Department of Energy, Richland Operations Office, Richland, Washington and BHI, 2003, *Instruction Guide for Remediation of the*
 16 *100 Areas Waste Sites*, 0100X-IG-G0001, Rev. 5, Bechtel Hanford Inc., Richland, Washington.
 17 3) Lookup values from DOE-RL, 2005b, Remedial Design Report/Remedial Action Work Plan for the 100 Area, DOE/RL-96-17, Rev. 5,
 18 U.S. Department of Energy, Richland Operations Office, Richland, Washington.
 19 4) Field sampling information from WCH, 2006b, *100B/C Remaining Pipeline and Sewers Sampling and Field Services*, Logbook EL-1585-5,
 20 pp. 83-100, Washington Closure Hanford, Richland, Washington and WCH, 2006c, *100B/C Remaining Pipeline and Sewers Sampling and*
 21 *Field Services*, Logbook EL-1585-6, pp. 2-30, Washington Closure Hanford, Richland, Washington.

23 Solution:

24 Calculation methodology is described in Appendix A of DOE-RL (2005a). Data from attached worksheets are used to calculate the required
 25 number of verification samples. Variance calculation is based on the three isotopes (cesium-137, cobalt-60, and europium-152) used to develop
 26 the statistical approach in DOE-RL (2005a), as well as the contaminant of potential concern europium-154. The statistical design is based on the
 27 premise that these isotopes are the predominant components of the contamination and are representative of potential residual contamination
 28 distribution.

30 Sheet No. Contents

Topic

31 1	Calculation Summary	Summary of calculation brief
32 2 - 5	Statistical Evaluation of Analytical Data - Excavation Shallow Zone	Required number of samples calculation
33 6 - 14	Statistical Evaluation of Analytical Data - Overburden	Required number of samples calculation

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron *JMC* Date 7/31/2006
 Project 100-B/C Pipelines Field Remediation Job No. 14655
 Subject 100-B-14:1 Shallow Zone and Overburden Variance Calculations

Calc. No. 0100B-CA-V0286 Rev. No. 0
 Checked T. M. Blakley *TMB* Date 8/1/06
 Sheet No. 2 of 14

- 1 Statistical Evaluation of Analytical Data - Excavation Shallow Zone
 2 Sample Areas: A through H
 3 The required number of samples resulting from the calculation is highlighted at the bottom of Sheet 5.
 4 Each value is reflective of the specific analyte evaluated.
 5 The highest value of the four evaluations is used to determine the required number of samples as compared against the default of four.
 6 Number of samples formula from DOE-RL (2005a), Appendix A.
 7
 8
 9 Sample values from gamma energy analysis

	Sample Location	Sample Number	Sample Date	Cobalt-60		Cesium-137		Europium-152		Europium-154	
				pCi/g	Q	pCi/g	Q	pCi/g	Q	pCi/g	Q
	Look-up Value (HT)----->			1:4		6:2		3:3		3	
	A1-2	J12979	6/1/06	0.093	U	0.093	U	0.24	U	0.25	U
	A1-3	J12978	6/1/06	0.052	U	0.046	U	0.12	U	0.15	U
	A1-4	J12977	6/1/06	0.054	U	0.049	U	0.11	U	0.16	U
	A1-10	J12981	6/1/06	0.054	U	0.049	U	0.12	U	0.18	U
	A1-13	J12980	6/1/06	0.054	U	0.051	U	0.12	U	0.18	U
	A1-16	J12982	6/1/06	0.045	U	0.044	U	0.10	U	0.14	U
	A2-3	J12971	6/1/06	0.054	U	0.048	U	0.12	U	0.16	U
	A2-6	J12973	6/1/06	0.038	U	0.041	U	0.10	U	0.12	U
	A2-7	J12972	6/1/06	0.041	U	0.035	U	0.089	U	0.15	U
	A2-10	J12976	6/1/06	0.059	U	0.060	U	0.14	U	0.18	U
	A2-14	J12974	6/1/06	0.076	U	0.066	U	0.18	U	0.23	U
	A2-15	J12975	6/1/06	0.095	U	0.065	U	0.18	U	0.28	U
	A3-1	J12965	6/1/06	0.063	U	0.063	U	0.13	U	0.23	U
	A3-2	J12966	6/1/06	0.066	U	0.060	U	0.13	U	0.21	U
	A3-4	J12967	6/1/06	0.042	U	0.038	U	0.10	U	0.13	U
	A3-5	J12968	6/1/06	0.081	U	0.083	U	0.20	U	0.30	U
	A3-9	J12969	6/1/06	0.075	U	0.075	U	0.20	U	0.23	U
	A3-11	J12970	6/1/06	0.078	U	0.059	U	0.18	U	0.28	U
	A4-3	J12964	6/1/06	0.064	U	0.072	U	0.17	U	0.23	U
	A4-4	J12962	6/1/06	0.045	U	0.043	U	0.091	U	0.15	U
	A4-7	J12963	6/1/06	0.045	U	0.040	U	0.098	U	0.12	U
	A4-9	J12961	6/1/06	0.064	U	0.061	U	0.12	U	0.22	U
	A4-12	J12960	6/1/06	0.055	U	0.055	U	0.15	U	0.18	U
	A4-13	J12959	6/1/06	0.040	U	0.037	U	0.093	U	0.11	U
	B5-1	J128D3	6/1/06	0.038	U	0.047	U	0.087	U	0.10	U
	B5-2	J128D2	6/1/06	0.050	U	0.040	U	0.090	U	0.17	U
	B5-5	J128D1	6/1/06	0.052	U	0.063	U	0.12	U	0.18	U
	B5-7	J128D0	6/1/06	0.035	U	0.035	U	0.084	U	0.10	U
	B5-13	J128C9	6/1/06	0.055	U	0.055	U	0.11	U	0.19	U
	B5-15	J128C8	6/1/06	0.053	U	0.044	U	0.13	U	0.20	U
	B6-1	J128C6	5/31/06	0.038	U	0.038	U	0.092	U	0.12	U
	B6-10	J128C5	5/31/06	0.048	U	0.041	U	0.13	U	0.19	U
	B6-12	J128C4	5/31/06	0.068	U	0.072	U	0.15	U	0.21	U
	B6-13	J128C3	5/31/06	0.058	U	0.058	U	0.16	U	0.20	U
	B6-15	J128C2	5/31/06	0.060	U	0.065	U	0.18	U	0.23	U
	B6-16	J128C1	5/31/06	0.032	U	0.034	U	0.085	U	0.12	U
	B7-1	J128B9	5/31/06	0.036	U	0.033	U	0.085	U	0.11	U
	B7-3	J128B7	5/31/06	0.056	U	0.064	U	0.13	U	0.15	U
	B7-4	J128B6	5/31/06	0.036	U	0.033	U	0.084	U	0.12	U
	B7-5	J128B5	5/31/06	0.061	U	0.043	U	0.14	U	0.20	U
	B7-8	J128B4	5/31/06	0.051	U	0.049	U	0.10	U	0.21	U
	B7-11	J128B8	5/31/06	0.052	U	0.039	U	0.13	U	0.16	U
	B8-2	J128B3	5/31/06	0.069	U	0.055	U	0.14	U	0.20	U
	B8-3	J128B2	5/31/06	0.039	U	0.046	U	0.11	U	0.14	U
	B8-4	J128B1	5/31/06	0.055	U	0.043	U	0.14	U	0.14	U
	B8-8	J12898	5/31/06	0.070	U	0.066	U	0.18	U	0.23	U
	B8-12	J128B0	5/31/06	0.054	U	0.056	U	0.11	U	0.19	U
	B8-13	J12899	5/31/06	0.083	U	0.067	U	0.15	U	0.31	U
	C9-3	J12897	5/31/06	0.034	U	0.032	U	0.083	U	0.11	U

63 HT = hypothesis testing value

64 Q = qualifier

65 U = undetected

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron *JMC* Date 7/31/2006
 Project 100-B/C Pipelines Field Remediation Job No. 14655
 Subject 100-B-14:1 Shallow Zone and Overburden Variance Calculations

Calc. No. 0100B-CA-V0286 Rev. No. 0
 Checked T. M. Blakley *TMB* Date 8/1/06
 Sheet No. 3 of 14

1 Statistical Evaluation of Analytical Data - Excavation Shallow Zone (continued)

Sample Location	Sample Number	Sample Date	Cobalt-60		Cesium-137		Europium-152		Europium-154	
			pCi/g	Q	pCi/g	Q	pCi/g	Q	pCi/g	Q
C9-4	J12896	5/31/06	0.067	U	0.051	U	0.16	U	0.18	U
C9-5	J12895	5/31/06	0.075	U	0.061	U	0.14	U	0.25	U
C9-10	J12894	5/31/06	0.072	U	0.056	U	0.13	U	0.30	U
C9-14	J12893	5/31/06	0.073	U	0.072	U	0.18	U	0.24	U
C9-16	J12892	5/31/06	0.038	U	0.038	U	0.096	U	0.12	U
C10-3	J12889	5/31/06	0.061	U	0.065	U	0.17	U	0.20	U
C10-4	J12888	5/31/06	0.061	U	0.053	U	0.13	U	0.19	U
C10-8	J12887	5/31/06	0.056	U	0.043	U	0.13	U	0.16	U
C10-10	J12890	5/31/06	0.059	U	0.060	U	0.16	U	0.25	U
C10-14	J12886	5/31/06	0.040	U	0.044	U	0.096	U	0.12	U
C10-16	J12885	5/31/06	0.060	U	0.063	U	0.16	U	0.19	U
C1-2	J128F5	5/30/06	0.047	U	0.045	U	0.094	U	0.16	U
C1-3	J128F4	5/30/06	0.050	U	0.053	U	0.11	U	0.16	U
C1-4	J128F2	5/30/06	0.029	U	0.058	U	0.071	U	0.090	U
C1-10	J128F6	5/30/06	0.033	U	0.032	U	0.10	U	0.12	U
C1-13	J128F3	5/30/06	0.063	U	0.063	U	0.17	U	0.21	U
C1-16	J128F1	5/30/06	0.041	U	0.031	U	0.11	U	0.13	U
C2-3	J128D9	5/30/06	0.044	U	0.068	U	0.12	U	0.21	U
C2-6	J128D8	5/30/06	0.053	U	0.052	U	0.14	U	0.17	U
C2-7	J128D7	5/30/06	0.025	U	0.023	U	0.059	U	0.074	U
C2-10	J128F0	5/30/06	0.047	U	0.043	U	0.096	U	0.15	U
C2-14	J128D6	5/30/06	0.036	U	0.029	U	0.092	U	0.11	U
C2-15	J128D5	5/30/06	0.045	U	0.041	U	0.095	U	0.17	U
D3-1	J12983	6/1/06	0.079	U	0.079	U	0.19	U	0.23	U
D3-2	J12985	6/1/06	0.060	U	0.052	U	0.10	U	0.17	U
D3-4	J12987	6/1/06	0.086	U	0.085	U	0.22	U	0.29	U
D3-5	J12988	6/1/06	0.061	U	0.055	U	0.14	U	0.23	U
D3-9	J12984	6/1/06	0.067	U	0.064	U	0.15	U	0.25	U
D3-11	J12986	6/1/06	0.045	U	0.048	U	0.12	U	0.16	U
D4-3	J12990	6/1/06	0.049	U	0.045	U	0.11	U	0.16	U
D4-4	J12991	6/1/06	0.069	U	0.058	U	0.17	U	0.21	U
D4-7	J12994	6/1/06	0.043	U	0.041	U	0.10	U	0.12	U
D4-9	J12989	6/1/06	0.053	U	0.055	U	0.11	U	0.18	U
D4-12	J12992	6/1/06	0.049	U	0.053	U	0.12	U	0.22	U
D4-13	J12993	6/1/06	0.042	U	0.045	U	0.093	U	0.13	U
D5-1	J12998	6/6/06	0.081	U	0.079	U	0.23	U	0.29	U
D5-2	J129B0	6/6/06	0.063	U	0.070	U	0.15	U	0.24	U
D5-5	J12999	6/6/06	0.10	U	0.087	U	0.17	U	0.31	U
D5-7	J129B1	6/6/06	0.045	U	0.040	U	0.094	U	0.13	U
D5-13	J129B2	6/6/06	0.043	U	0.048	U	0.11	U	0.13	U
D5-15	J129B3	6/6/06	0.058	U	0.063	U	0.18	U	0.25	U
D6-1	J129B4	6/6/06	0.073	U	0.066	U	0.17	U	0.22	U
D6-10	J129B5	6/6/06	0.062	U	0.073	U	0.15	U	0.24	U
D6-12	J129B6	6/6/06	0.054	U	0.052	U	0.12	U	0.18	U
D6-13	J129B7	6/6/06	0.039	U	0.039	U	0.090	U	0.16	U
D6-15	J129B8	6/6/06	0.033	U	0.031	U	0.074	U	0.10	U
D6-16	J129B9	6/6/06	0.076	U	0.070	U	0.17	U	0.25	U
E7-1	J129C0	6/6/06	0.050	U	0.053	U	0.11	U	0.18	U
E7-3	J129C1	6/6/06	0.042	U	0.044	U	0.092	U	0.15	U
E7-4	J129C3	6/6/06	0.080	U	0.076	U	0.20	U	0.27	U
E7-5	J129C4	6/6/06	0.093	U	0.080	U	0.19	U	0.31	U
E7-8	J129C5	6/6/06	0.065	U	0.044	U	0.14	U	0.19	U
E7-11	J129C2	6/6/06	0.039	U	0.040	U	0.10	U	0.13	U
E8-2	J129C6	6/6/06	0.050	U	0.048	U	0.10	U	0.17	U
E8-3	J129C7	6/6/06	0.035	U	0.041	U	0.099	U	0.13	U
E8-4	J129C8	6/6/06	0.078	U	0.071	U	0.21	U	0.22	U
E8-8	J129D1	6/6/06	0.051	U	0.042	U	0.10	U	0.15	U
E8-12	J129C9	6/6/06	0.10	U	0.079	U	0.19	U	0.33	U
E8-13	J129D0	6/6/06	0.058	U	0.061	U	0.12	U	0.16	U
E9-3	J129D3	6/6/06	0.058	U	0.064	U	0.15	U	0.24	U

64 Q = qualifier

65 U = undetected

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron *JMC* Date 7/31/2006
 Project 100-B/C Pipelines Field Remediation Job No. 14655
 Subject 100-B-14:1 Shallow Zone and Overburden Variance Calculations

Calc. No. 0100B-CA-V0286 Rev. No. 0
 Checked T. M. Blakley *TMB* Date 8/1/06
 Sheet No. 4 of 14

1 Statistical Evaluation of Analytical Data - Excavation Shallow Zone (continued)

Sample Location	Sample Number	Sample Date	Cobalt-60		Cesium-137		Europium-152		Europium-154	
			pCi/g	Q	pCi/g	Q	pCi/g	Q	pCi/g	Q
E9-4	J129D4	6/6/06	0.047	U	0.043	U	0.12	U	0.15	U
E9-5	J129D5	6/6/06	0.033	U	0.038	U	0.087	U	0.14	U
E9-10	J129D2	6/6/06	0.046	U	0.039	U	0.10	U	0.13	U
E9-14	J129D6	6/6/06	0.044	U	0.045	U	0.12	U	0.17	U
E9-16	J129D7	6/6/06	0.082	U	0.084	U	0.24	U	0.31	U
E10-3	J129D8	6/6/06	0.097	U	0.094	U	0.22	U	0.41	U
E10-4	J129D9	6/6/06	0.073	U	0.077	U	0.17	U	0.24	U
E10-8	J129F0	6/6/06	0.065	U	0.066	U	0.13	U	0.21	U
E10-10	J129F1	6/6/06	0.044	U	0.045	U	0.11	U	0.14	U
E10-14	J129F2	6/6/06	0.092	U	0.077	U	0.19	U	0.26	U
E10-16	J129F3	6/6/06	0.082	U	0.076	U	0.19	U	0.36	U
F1-2	J129J2	6/7/06	0.066	U	0.063	U	0.17	U	0.23	U
F1-3	J129X0	6/7/06	0.035	U	0.036	U	0.086	U	0.16	U
F1-4	J129X1	6/7/06	0.062	U	0.056	U	0.15	U	0.19	U
F1-10	J129X2	6/7/06	0.035	U	0.030	U	0.079	U	0.11	U
F1-13	J129J3	6/7/06	0.039	U	0.038	U	0.089	U	0.13	U
F1-16	J129X3	6/7/06	0.051	U	0.051	U	0.11	U	0.19	U
F2-3	J129F5	6/6/06	0.045	U	0.047	U	0.10	U	0.17	U
F2-6	J129F6	6/6/06	0.046	U	0.036	U	0.097	U	0.12	U
F2-7	J129F8	6/6/06	0.058	U	0.049	U	0.12	U	0.18	U
F2-10	J129F4	6/6/06	0.069	U	0.056	U	0.14	U	0.27	U
F2-14	J129F7	6/6/06	0.065	U	0.084	U	0.17	U	0.27	U
F2-15	J129F9	6/6/06	0.054	U	0.056	U	0.13	U	0.18	U
F3-1	J129H0	6/6/06	0.065	U	0.056	U	0.16	U	0.23	U
F3-2	J129H2	6/6/06	0.049	U	0.048	U	0.089	U	0.18	U
F3-4	J129H4	6/6/06	0.075	U	0.076	U	0.20	U	0.28	U
F3-5	J129H5	6/6/06	0.057	U	0.065	U	0.14	U	0.22	U
F3-9	J129H1	6/6/06	0.057	U	0.059	U	0.13	U	0.20	U
F3-11	J129H3	6/6/06	0.038	U	0.038	U	0.097	U	0.12	U
F4-3	J129H6	6/6/06	0.045	U	0.044	U	0.11	U	0.18	U
F4-4	J129H7	6/6/06	0.050	U	0.042	U	0.10	U	0.14	U
F4-7	J129H8	6/6/06	0.051	U	0.064	U	0.13	U	0.23	U
F4-9	J129H9	6/6/06	0.064	U	0.064	U	0.14	U	0.20	U
F4-12	J129J1	6/6/06	0.12	U	0.081	U	0.18	U	0.26	U
F4-13	J129J0	6/6/06	0.045	U	0.046	U	0.094	U	0.15	U
G5-1	J128V4	6/8/06	0.098	U	0.094	U	0.26	U	0.31	U
G5-2	J128V5	6/8/06	0.064	U	0.062	U	0.15	U	0.22	U
G5-5	J128V6	6/8/06	0.046	U	0.056	U	0.11	U	0.19	U
G5-7	J128V3	6/8/06	0.054	U	0.051	U	0.12	U	0.14	U
G5-13	J128V1	6/8/06	0.065	U	0.061	U	0.14	U	0.24	U
G5-15	J128V2	6/8/06	0.054	U	0.047	U	0.092	U	0.19	U
G6-1	J128V7	6/8/06	0.042	U	0.042	U	0.10	U	0.13	U
G6-10	J128V8	6/8/06	0.083	U	0.083	U	0.21	U	0.26	U
G6-12	J128V9	6/8/06	0.048	U	0.052	U	0.12	U	0.17	U
G6-13	J128W0	6/8/06	0.042	U	0.044	U	0.098	U	0.18	U
G6-15	J128W2	6/8/06	0.089	U	0.090	U	0.24	U	0.28	U
G6-16	J128W1	6/8/06	0.045	U	0.043	U	0.099	U	0.12	U
G7-1	J128W3	6/8/06	0.086	U	0.072	U	0.21	U	0.28	U
G7-3	J128W5	6/8/06	0.048	U	0.081	U	0.11	U	0.14	U
G7-4	J128W4	6/8/06	0.047	U	0.047	U	0.10	U	0.16	U
G7-5	J128W6	6/8/06	0.044	U	0.056	U	0.11	U	0.20	U
G7-8	J128W7	6/8/06	0.044	U	0.046	U	0.10	U	0.14	U
G7-11	J128W8	6/8/06	0.073	U	0.072	U	0.20	U	0.29	U
G8-2	J128Y1	6/8/06	0.039	U	0.038	U	0.094	U	0.099	U
G8-3	J128Y2	6/8/06	0.10	U	0.10	U	0.25	U	0.34	U
G8-4	J128Y3	6/8/06	0.070	U	0.069	U	0.13	U	0.23	U
G8-8	J128Y4	6/8/06	0.047	U	0.044	U	0.10	U	0.14	U
G8-12	J128Y5	6/8/06	0.089	U	0.087	U	0.22	U	0.27	U
G8-13	J128Y6	6/8/06	0.059	U	0.054	U	0.12	U	0.21	U
H9-3	J128X0	6/8/06	0.072	U	0.078	U	0.20	U	0.24	U

64 Q = qualifier

65 U = undetected

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron *JMC* Date 7/31/2006
 Project 100-B/C Pipelines Field Remediation Job No. 14655
 Subject 100-B-14:1 Shallow Zone and Overburden Variance Calculations

Calc. No. 0100B-CA-V0286 Rev. No. 0
 Checked T. M. Blakley *TMB* Date 7/1/06
 Sheet No. 5 of 14

1 Statistical Evaluation of Analytical Data - Excavation Shallow Zone (continued)

Sample Location	Sample Number	Sample Date	Cobalt-60		Cesium-137		Europium-152		Europium-154	
			pCi/g	Q	pCi/g	Q	pCi/g	Q	pCi/g	Q
H9-4	J128W9	6/8/06	0.040	U	0.057	U	0.11	U	0.20	U
H9-5	J128X1	6/8/06	0.045	U	0.040	U	0.10	U	0.17	U
H9-10	J128X3	6/8/06	0.077	U	0.076	U	0.21	U	0.27	U
H9-14	J128X2	6/8/06	0.044	U	0.044	U	0.11	U	0.14	U
H9-16	J128X4	6/8/06	0.052	U	0.046	U	0.11	U	0.20	U
H10-3	J128X5	6/8/06	0.048	U	0.053	U	0.12	U	0.15	U
H10-4	J128Y0	6/8/06	0.054	U	0.048	U	0.11	U	0.16	U
H10-8	J128X6	6/8/06	0.069	U	0.121		0.18	U	0.22	U
H10-10	J128X7	6/8/06	0.047	U	0.048	U	0.097	U	0.16	U
H10-14	J128X8	6/8/06	0.040	U	0.039	U	0.10	U	0.10	U
H10-16	J128X9	6/8/06	0.084	U	0.076	U	0.22	U	0.29	U
H1-2	J128Y9	6/8/06	0.071	U	0.059	U	0.14	U	0.15	U
H1-3	J128Y7	6/8/06	0.051	U	0.070	U	0.11	U	0.14	U
H1-4	J128Y8	6/8/06	0.10	U	0.088	U	0.21	U	0.29	U
H1-10	J12900	6/8/06	0.061	U	0.060	U	0.12	U	0.17	U
H1-13	J12901	6/8/06	0.059	U	0.052	U	0.13	U	0.18	U
H1-16	J12902	6/8/06	0.089	U	0.083	U	0.23	U	0.29	U
H2-3	J12903	6/8/06	0.078	U	0.068	U	0.14	U	0.22	U
H2-6	J12904	6/8/06	0.065	U	0.059	U	0.13	U	0.22	U
H2-7	J12905	6/8/06	0.047	U	0.045	U	0.11	U	0.14	U
H2-10	J12908	6/8/06	0.034	U	0.046	U	0.12	U	0.14	U
H2-14	J12907	6/8/06	0.082	U	0.076	U	0.17	U	0.24	U
H2-15	J12906	6/8/06	0.11	U	0.11	U	0.26	U	0.37	U
Mean (LV) =====>			0.06		0.06		0.14		0.19	
Standard deviation (S) =====>			0.02		0.02		0.04		0.06	
Z _{1-α} (α=5%) =====>			1.645		1.645		1.645		1.645	
Z _{1-β} (β=20%) =====>			0.842		0.842		0.842		0.842	
Number of samples=====			1		1		1		1	

32 LV = likely value

33 Q = qualifier

34 S = standard deviation

35 U = undetected

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron *JMC* Date 7/31/2006
 Project 100-B/C Pipelines Field Remediation Job No. 14655
 Subject 100-B-14:1 Shallow Zone and Overburden Variance Calculations

Calc. No. 0100B-CA-V0286 Rev. No. 0
 Checked T. M. Blakley *TMB* Date 8/1/06
 Sheet No. 6 of 14

1 Statistical Evaluation of Analytical Data - Overburden

2 Sample Areas: A through V

3 The required number of samples resulting from the calculation is highlighted at the bottom of Sheet 14.

4 Each value is reflective of the specific analyte evaluated.

5 The highest value of the four evaluations is used to determine the required number of samples as compared against the default of four.

6 Number of samples formula from DOE-RL (2005a), Appendix A.

7

8

9 Sample values from gamma energy analysis

Sample Location	Sample Number	Sample Date	Cobalt-60		Cesium-137		Europium-152		Europium-154	
			pCi/g	Q	pCi/g	Q	pCi/g	Q	pCi/g	Q
Look-up Value (HT) →			1.4		6.2		3.3		3	
A1-2	J12BF5	6/19/06	0.045	U	0.132		0.11	U	0.14	U
A1-3	J12BF4	6/19/06	0.050	U	0.047	U	0.12	U	0.16	U
A1-4	J12BF3	6/19/06	0.082	U	0.058	U	0.16	U	0.23	U
A1-10	J12BF6	6/19/06	0.069	U	0.073	U	0.18	U	0.23	U
A1-13	J12BF2	6/19/06	0.069	U	0.062	U	0.18	U	0.25	U
A1-16	J12BF1	6/19/06	0.037	U	0.038	U	0.093	U	0.15	U
A2-3	J12BF0	6/19/06	0.049	U	0.049	U	0.12	U	0.19	U
A2-6	J12BD8	6/19/06	0.082	U	0.078	U	0.21	U	0.28	U
A2-7	J12BD9	6/19/06	0.072	U	0.057	U	0.16	U	0.25	U
A2-10	J12BD7	6/19/06	0.031	U	0.030	U	0.078	U	0.097	U
A2-14	J12BD5	6/19/06	0.053	U	0.046	U	0.12	U	0.20	U
A2-15	J12BD6	6/19/06	0.040	U	0.035	U	0.093	U	0.14	U
A3-1	J12BC7	6/19/06	0.077	U	0.054	U	0.17	U	0.25	U
A3-2	J12BC8	6/19/06	0.059	U	0.052	U	0.13	U	0.22	U
A3-4	J12BC4	6/19/06	0.039	U	0.051	U	0.10	U	0.20	U
A3-5	J12BC6	6/19/06	0.094	U	0.087	U	0.24	U	0.33	U
A3-9	J12BC5	6/19/06	0.053	U	0.052	U	0.12	U	0.17	U
A3-11	J12BC3	6/19/06	0.096	U	0.071	U	0.16	U	0.27	U
A4-3	J12BD2	6/19/06	0.040	U	0.044	U	0.098	U	0.15	U
A4-4	J12BD1	6/19/06	0.052	U	0.048	U	0.11	U	0.16	U
A4-7	J12BD3	6/19/06	0.033	U	0.044		0.087	U	0.12	U
A4-9	J12BD4	6/19/06	0.065	U	0.116		0.15	U	0.20	U
A4-12	J12BC9	6/19/06	0.045	U	0.042	U	0.11	U	0.14	U
A4-13	J12BD0	6/19/06	0.054	U	0.053	U	0.15	U	0.19	U
B5-1	J12BC0	6/14/06	0.041	U	0.040	U	0.096	U	0.11	U
B5-2	J12BB9	6/14/06	0.037	U	0.034	U	0.089	U	0.15	U
B5-5	J12BC1	6/14/06	0.087	U	0.079	U	0.21	U	0.28	U
B5-7	J12BB7	6/14/06	0.063	U	0.063	U	0.16	U	0.20	U
B5-13	J12BC2	6/14/06	0.055	U	0.062	U	0.14	U	0.19	U
B5-15	J12BB8	6/14/06	0.057	U	0.045	U	0.13	U	0.17	U
B6-1	J12BB6	6/14/06	0.038	U	0.042	U	0.11	U	0.15	U
B6-10	J12BB4	6/14/06	0.062	U	0.047	U	0.11	U	0.19	U
B6-12	J12BB1	6/14/06	0.039	U	0.035	U	0.089	U	0.14	U
B6-13	J12BB5	6/14/06	0.049	U	0.044	U	0.10	U	0.15	U
B6-15	J12BB3	6/14/06	0.065	U	0.067	U	0.20	U	0.23	U
B6-16	J12BB2	6/14/06	0.030	U	0.037	U	0.088	U	0.12	U
B7-1	J12BB0	6/14/06	0.069	U	0.055	U	0.12	U	0.20	U
B7-3	J12B97	6/14/06	0.038	U	0.034	U	0.085	U	0.12	U
B7-4	J12B95	6/14/06	0.068	U	0.056	U	0.16	U	0.23	U
B7-5	J12B99	6/14/06	0.060	U	0.065	U	0.18	U	0.24	U
B7-8	J12B96	6/14/06	0.051	U	0.052	U	0.12	U	0.19	U
B7-11	J12B98	6/14/06	0.039	U	0.038	U	0.094	U	0.12	U
B8-2	J12B93	6/14/06	0.072	U	0.070	U	0.17	U	0.24	U
B8-3	J12B92	6/14/06	0.043	U	0.045	U	0.10	U	0.14	U
B8-4	J12B91	6/14/06	0.079	U	0.072	U	0.20	U	0.25	U
B8-8	J12B90	6/14/06	0.040	U	0.036	U	0.079	U	0.14	U
B8-12	J12B89	6/14/06	0.065	U	0.054	U	0.12	U	0.21	U
B8-13	J12B94	6/14/06	0.038	U	0.037	U	0.096	U	0.14	U
C9-3	J129V5	6/14/06	0.041	U	0.039	U	0.10	U	0.13	U
C9-4	J129V6	6/14/06	0.066	U	0.076	U	0.20	U	0.21	U

64 HT = hypothesis testing value

65 Q = qualifier

66 U = undetected

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron *JMC* Date 7/31/2006
 Project 100-B/C Pipelines Field Remediation Job No. 14655
 Subject 100-B-14:1 Shallow Zone and Overburden Variance Calculations

Calc. No. 0100B-CA-V0286 Rev. No. 0
 Checked T. M. Blakley *TMB* Date 8/1/06
 Sheet No. 7 of 14

1 Statistical Evaluation of Analytical Data - Overburden (continued)

Sample Location	Sample Number	Sample Date	Cobalt-60		Cesium-137		Europium-152		Europium-154	
			pCi/g	Q	pCi/g	Q	pCi/g	Q	pCi/g	Q
C9-5	J129V9	6/14/06	0.035	U	0.037	U	0.094	U	0.12	U
C9-10	J129V7	6/14/06	0.049	U	0.042	U	0.095	U	0.15	U
C9-14	J129V8	6/14/06	0.037	U	0.035	U	0.082	U	0.13	U
C9-16	J129W0	6/14/06	0.051	U	0.044	U	0.11	U	0.19	U
C10-3	J129W3	6/14/06	0.035	U	0.032	U	0.081	U	0.14	U
C10-4	J129W1	6/14/06	0.043	U	0.040	U	0.10	U	0.13	U
C10-8	J129W2	6/14/06	0.044	U	0.043	U	0.11	U	0.14	U
C10-10	J129W5	6/14/06	0.023	U	0.022	U	0.055	U	0.068	U
C10-14	J129W4	6/14/06	0.022	U	0.024	U	0.059	U	0.087	U
C10-16	J129W6	6/14/06	0.075	U	0.075	U	0.20	U	0.27	U
C1-2	J129W9	6/14/06	0.042	U	0.036	U	0.093	U	0.10	U
C1-3	J129W8	6/14/06	0.047	U	0.044	U	0.11	U	0.18	U
C1-4	J129W7	6/14/06	0.061	U	0.054	U	0.13	U	0.20	U
C1-10	J12B80	6/14/06	0.070	U	0.072	U	0.18	U	0.22	U
C1-13	J12B81	6/14/06	0.066	U	0.054	U	0.13	U	0.19	U
C1-16	J12B82	6/14/06	0.040	U	0.036	U	0.087	U	0.14	U
C2-3	J12B88	6/14/06	0.051	U	0.053	U	0.14	U	0.18	U
C2-6	J12B84	6/14/06	0.067	U	0.069	U	0.19	U	0.25	U
C2-7	J12B85	6/14/06	0.025	U	0.024	U	0.055	U	0.093	U
C2-10	J12B83	6/14/06	0.044	U	0.048	U	0.11	U	0.15	U
C2-14	J12B86	6/14/06	0.042	U	0.042	U	0.10	U	0.13	U
C2-15	J12B87	6/14/06	0.065	U	0.185		0.14	U	0.20	U
D3-1	J129V0	6/13/06	0.048	U	0.050	U	0.097	U	0.17	U
D3-2	J129T9	6/13/06	0.058	U	0.057	U	0.15	U	0.18	U
D3-4	J129V2	6/13/06	0.094	U	0.080	U	0.22	U	0.27	U
D3-5	J129V1	6/13/06	0.047	U	0.043	U	0.11	U	0.13	U
D3-9	J129V3	6/13/06	0.077	U	0.071	U	0.16	U	0.22	U
D3-11	J129V4	6/13/06	0.052	U	0.044	U	0.11	U	0.19	U
D4-3	J12BR9	6/19/06	0.052	U	0.075		0.13	U	0.20	U
D4-4	J12BT0	6/19/06	0.054	U	0.238		0.15	U	0.16	U
D4-7	J12BR8	6/19/06	0.077	U	0.098		0.17	U	0.25	U
D4-9	J12BR6	6/19/06	0.029	U	0.030	U	0.070	U	0.092	U
D4-12	J12BR7	6/19/06	0.075	U	0.069	U	0.18	U	0.25	U
D4-13	J12BR5	6/19/06	0.052	U	0.225		0.097	U	0.14	U
D5-1	J129N6	6/12/06	0.035	U	0.035	U	0.091	U	0.13	U
D5-2	J129N7	6/12/06	0.065	U	0.057	U	0.14	U	0.25	U
D5-5	J129N5	6/12/06	0.042	U	0.037	U	0.10	U	0.14	U
D5-7	J129N8	6/12/06	0.043	U	0.043	U	0.093	U	0.16	U
D5-13	J129N4	6/12/06	0.061	U	0.043	U	0.12	U	0.20	U
D5-15	J129N3	6/12/06	0.040	U	0.042	U	0.11	U	0.15	U
D6-1	J129N2	6/12/06	0.060	U	0.050	U	0.13	U	0.20	U
D6-10	J129N0	6/12/06	0.040	U	0.039	U	0.10	U	0.13	U
D6-12	J129M8	6/12/06	0.038	U	0.041	U	0.10	U	0.16	U
D6-13	J129N1	6/12/06	0.070	U	0.062	U	0.15	U	0.20	U
D6-15	J129M9	6/12/06	0.035	U	0.038	U	0.093	U	0.12	U
D6-16	J129M7	6/12/06	0.057	U	0.051	U	0.14	U	0.20	U
E7-1	J129P8	6/13/06	0.12	U	0.11	U	0.27	U	0.35	U
E7-3	J129P6	6/13/06	0.049	U	0.054	U	0.12	U	0.20	U
E7-4	J129P5	6/13/06	0.067	U	0.051	U	0.14	U	0.24	U
E7-5	J129P9	6/13/06	0.051	U	0.059	U	0.14	U	0.26	U
E7-8	J129P7	6/13/06	0.045	U	0.048	U	0.11	U	0.14	U
E7-11	J129R0	6/13/06	0.063	U	0.053	U	0.11	U	0.20	U
E8-2	J129T2	6/13/06	0.053	U	0.041	U	0.099	U	0.20	U
E8-3	J129R2	6/13/06	0.049	U	0.046	U	0.11	U	0.15	U
E8-4	J129R1	6/13/06	0.079	U	0.070	U	0.19	U	0.22	U
E8-8	J129R3	6/13/06	0.083	U	0.077	U	0.23	U	0.30	U
E8-12	J129R4	6/13/06	0.054	U	0.043	U	0.10	U	0.19	U
E8-13	J129R5	6/13/06	0.048	U	0.038	U	0.12	U	0.15	U
E9-3	J129R8	6/13/06	0.033	U	0.028	U	0.064	U	0.11	U
E9-4	J129R7	6/13/06	0.035	U	0.037	U	0.082	U	0.13	U
E9-5	J129R6	6/13/06	0.063	U	0.12	U	0.16	U	0.20	U

65 Q = qualifier
 66 U = undetected

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron *JMC* Date 7/31/2006
 Project 100-B/C Pipelines Field Remediation Job No. 14655
 Subject 100-B-14:1 Shallow Zone and Overburden Variance Calculations

Calc. No. 0100B-CA-V0286 Rev. No. 0
 Checked T. M. Blakley *TMB* Date 8/1/06
 Sheet No. 8 of 14

1 Statistical Evaluation of Analytical Data - Overburden (continued)

Sample Location	Sample Number	Sample Date	Cobalt-60		Cesium-137		Europium-152		Europium-154	
			pCi/g	Q	pCi/g	Q	pCi/g	Q	pCi/g	Q
E9-10	J129R9	6/13/06	0.030	U	0.032	U	0.080	U	0.099	U
E9-14	J129T1	6/13/06	0.064	U	0.056	U	0.14	U	0.23	U
E9-16	J129T0	6/13/06	0.074	U	0.072	U	0.19	U	0.25	U
E10-3	J129T3	6/13/06	0.041	U	0.044	U	0.10	U	0.14	U
E10-4	J129T4	6/13/06	0.071	U	0.066	U	0.18	U	0.24	U
E10-8	J129T5	6/13/06	0.050	U	0.055	U	0.13	U	0.18	U
E10-10	J129T8	6/13/06	0.086	U	0.079	U	0.21	U	0.27	U
E10-14	J129T7	6/13/06	0.038	U	0.039	U	0.094	U	0.13	U
E10-16	J129T6	6/13/06	0.049	U	0.038	U	0.081	U	0.15	U
F1-2	J129M5	6/12/06	0.041	U	0.037	U	0.096	U	0.14	U
F1-3	J129M4	6/12/06	0.054	U	0.050	U	0.12	U	0.16	U
F1-4	J129M3	6/12/06	0.036	U	0.039	U	0.11	U	0.12	U
F1-10	J129M6	6/12/06	0.037	U	0.034	U	0.086	U	0.12	U
F1-13	J129M2	6/12/06	0.036	U	0.042	U	0.11	U	0.14	U
F1-16	J129M1	6/12/06	0.078	U	0.062	U	0.16	U	0.24	U
F2-3	J129L9	6/12/06	0.048	U	0.045	U	0.10	U	0.18	U
F2-6	J129L7	6/12/06	0.054	U	0.050	U	0.12	U	0.18	U
F2-7	J129L5	6/12/06	0.044	U	0.043	U	0.10	U	0.13	U
F2-10	J129M0	6/12/06	0.043	U	0.038	U	0.096	U	0.13	U
F2-14	J129L8	6/12/06	0.059	U	0.058	U	0.13	U	0.21	U
F2-15	J129L6	6/12/06	0.063	U	0.054	U	0.12	U	0.23	U
F3-1	J129L3	6/12/06	0.074	U	0.059	U	0.13	U	0.20	U
F3-2	J129L4	6/12/06	0.047	U	0.041	U	0.11	U	0.18	U
F3-4	J129L0	6/12/06	0.062	U	0.048	U	0.12	U	0.21	U
F3-5	J129K9	6/12/06	0.053	U	0.055	U	0.15	U	0.19	U
F3-9	J129L2	6/12/06	0.052	U	0.045	U	0.11	U	0.15	U
F3-11	J129L1	6/12/06	0.039	U	0.037	U	0.092	U	0.16	U
F4-3	J129K7	6/12/06	0.051	U	0.049	U	0.097	U	0.18	U
F4-4	J129K6	6/12/06	0.065	U	0.059	U	0.14	U	0.23	U
F4-7	J129K3	6/12/06	0.054	U	0.045	U	0.089	U	0.20	U
F4-9	J129K8	6/12/06	0.050	U	0.044	U	0.12	U	0.16	U
F4-12	J129K5	6/12/06	0.083	U	0.080	U	0.22	U	0.25	U
F4-13	J129K4	6/12/06	0.044	U	0.043	U	0.11	U	0.13	U
G5-1	J129K2	6/12/06	0.060	U	0.060	U	0.14	U	0.19	U
G5-2	J129K1	6/12/06	0.080	U	0.079	U	0.21	U	0.29	U
G5-5	J129J9	6/12/06	0.048	U	0.046	U	0.099	U	0.17	U
G5-7	J129J8	6/12/06	0.066	U	0.059	U	0.13	U	0.22	U
G5-13	J129K0	6/12/06	0.039	U	0.038	U	0.095	U	0.11	U
G5-15	J129J7	6/12/06	0.082	U	0.078	U	0.21	U	0.26	U
G6-1	J129J6	6/12/06	0.041	U	0.040	U	0.10	U	0.14	U
G6-10	J129J5	6/12/06	0.048	U	0.042	U	0.098	U	0.17	U
G6-12	J129J4	6/12/06	0.052	U	0.054	U	0.14	U	0.23	U
G6-13	J12953	6/12/06	0.092	U	0.074	U	0.20	U	0.27	U
G6-15	J12952	6/12/06	0.035	U	0.035	U	0.087	U	0.11	U
G6-16	J12951	6/12/06	0.038	U	0.035	U	0.073	U	0.14	U
G7-1	J12949	6/12/06	0.060	U	0.060	U	0.16	U	0.20	U
G7-3	J12948	6/12/06	0.040	U	0.038	U	0.10	U	0.13	U
G7-4	J12947	6/12/06	0.056	U	0.056	U	0.14	U	0.20	U
G7-5	J12946	6/12/06	0.070	U	0.076	U	0.20	U	0.28	U
G7-8	J12945	6/12/06	0.045	U	0.044	U	0.12	U	0.15	U
G7-11	J12950	6/12/06	0.037	U	0.038	U	0.091	U	0.12	U
G8-2	J12944	6/12/06	0.072	U	0.061	U	0.15	U	0.22	U
G8-3	J12943	6/12/06	0.077	U	0.076	U	0.19	U	0.25	U
G8-4	J12942	6/12/06	0.040	U	0.049	U	0.11	U	0.14	U
G8-8	J12939	6/12/06	0.032	U	0.036	U	0.092	U	0.10	U
G8-12	J12941	6/12/06	0.063	U	0.057	U	0.14	U	0.21	U
G8-13	J12940	6/12/06	0.077	U	0.071	U	0.19	U	0.25	U
H9-3	J12937	6/12/06	0.064	U	0.058	U	0.17	U	0.23	U
H9-4	J12936	6/12/06	0.042	U	0.039	U	0.092	U	0.13	U
H9-5	J12935	6/12/06	0.028	U	0.038	U	0.25	U	0.12	U
H9-10	J12938	6/12/06	0.060	U	0.049	U	0.13	U	0.17	U

65 Q = qualifier

66 U = undetected

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron *JMC* Date 7/31/2006
 Project 100-B/C Pipelines Field Remediation Job No. 14655
 Subject 100-B-14:1 Shallow Zone and Overburden Variance Calculations

Calc. No. 0100B-CA-V0286 Rev. No. 0
 Checked T. M. Blakley *TMB* Date 8/1/06
 Sheet No. 9 of 14

1 Statistical Evaluation of Analytical Data - Overburden (continued)

Sample Location	Sample Number	Sample Date	Cobalt-60		Cesium-137		Europium-152		Europium-154	
			pCi/g	Q	pCi/g	Q	pCi/g	Q	pCi/g	Q
H9-14	J12934	6/12/06	0.062	U	0.059	U	0.13	U	0.19	U
H9-16	J12933	6/12/06	0.069	U	0.069	U	0.20	U	0.27	U
H10-3	J12931	6/12/06	0.037	U	0.042	U	0.096	U	0.10	U
H10-4	J12930	6/12/06	0.054	U	0.049	U	0.13	U	0.19	U
H10-8	J12928	6/12/06	0.037	U	0.037	U	0.096	U	0.13	U
H10-10	J12932	6/12/06	0.036	U	0.039	U	0.088	U	0.13	U
H10-14	J12929	6/12/06	0.077	U	0.064	U	0.19	U	0.27	U
H10-16	J12927	6/12/06	0.032	U	0.041	U	0.097	U	0.10	U
H1-2	J12925	6/12/06	0.076	U	0.077	U	0.19	U	0.25	U
H1-3	J12924	6/12/06	0.039	U	0.038	U	0.090	U	0.13	U
H1-4	J12923	6/12/06	0.027	U	0.045	U	0.11	U	0.12	U
H1-10	J12926	6/12/06	0.055	U	0.055	U	0.14	U	0.23	U
H1-13	J12922	6/12/06	0.10	U	0.098	U	0.24	U	0.21	U
H1-16	J12921	6/12/06	0.063	U	0.064	U	0.16	U	0.22	U
H2-3	J12920	6/12/06	0.034	U	0.036	U	0.087	U	0.12	U
H2-6	J12918	6/12/06	0.071	U	0.060	U	0.13	U	0.19	U
H2-7	J12917	6/12/06	0.088	U	0.083	U	0.22	U	0.26	U
H2-10	J12919	6/12/06	0.041	U	0.047	U	0.15	U	0.17	U
H2-14	J12915	6/12/06	0.043	U	0.042	U	0.13	U	0.12	U
H2-15	J12916	6/12/06	0.040	U	0.038	U	0.095	U	0.12	U
I3-1	J12B70	6/8/06	0.072	U	0.062	U	0.17	U	0.24	U
I3-2	J12B69	6/8/06	0.044	U	0.040	U	0.098	U	0.13	U
I3-4	J12B68	6/8/06	0.039	U	0.047	U	0.096	U	0.19	U
I3-5	J12B72	6/8/06	0.040	U	0.043	U	0.085	U	0.15	U
I3-9	J12B73	6/8/06	0.035	U	0.031	U	0.077	U	0.10	U
I3-11	J12B71	6/8/06	0.053	U	0.050	U	0.11	U	0.16	U
I4-3	J12B74	6/8/06	0.070	U	0.068	U	0.17	U	0.24	U
I4-4	J12B75	6/8/06	0.049	U	0.057	U	0.14	U	0.23	U
I4-7	J12B76	6/8/06	0.033	U	0.039	U	0.091	U	0.16	U
I4-9	J12B78	6/8/06	0.038	U	0.040	U	0.081	U	0.14	U
I4-12	J12B77	6/8/06	0.040	U	0.040	U	0.095	U	0.12	U
I4-13	J12B79	6/8/06	0.079	U	0.075	U	0.19	U	0.23	U
I5-1	J128T5	6/8/06	0.079	U	0.077	U	0.20	U	0.28	U
I5-2	J128T7	6/8/06	0.058	U	0.051	U	0.13	U	0.19	U
I5-5	J128T6	6/8/06	0.044	U	0.044	U	0.10	U	0.11	U
I5-7	J128T8	6/8/06	0.045	U	0.035	U	0.095	U	0.16	U
I5-13	J128V0	6/8/06	0.074	U	0.068	U	0.19	U	0.25	U
I5-15	J128T9	6/8/06	0.037	U	0.037	U	0.10	U	0.12	U
I6-1	J12909	6/12/06	0.066	U	0.064	U	0.17	U	0.21	U
I6-10	J12910	6/12/06	0.050	U	0.050	U	0.12	U	0.20	U
I6-12	J12911	6/12/06	0.038	U	0.044	U	0.428		0.13	U
I6-13	J12912	6/12/06	0.035	U	0.035	U	0.085	U	0.11	U
I6-15	J12913	6/12/06	0.092	U	0.072	U	0.21	U	0.28	U
I6-16	J12914	6/12/06	0.058	U	0.058	U	0.12	U	0.19	U
J7-1	J12B62	6/8/06	0.080	U	0.071	U	0.20	U	0.27	U
J7-3	J12B63	6/8/06	0.043	U	0.054	U	0.13	U	0.18	U
J7-4	J12B64	6/8/06	0.049	U	0.047	U	0.11	U	0.23	U
J7-5	J12B67	6/8/06	0.060	U	0.055	U	0.12	U	0.16	U
J7-8	J12B65	6/8/06	0.042	U	0.038	U	0.095	U	0.13	U
J7-11	J12B66	6/8/06	0.070	U	0.068	U	0.18	U	0.22	U
J8-2	J12B56	6/8/06	0.035	U	0.046	U	0.10	U	0.13	U
J8-3	J12B57	6/8/06	0.039	U	0.038	U	0.096	U	0.13	U
J8-4	J12B58	6/8/06	0.055	U	0.053	U	0.16	U	0.19	U
J8-8	J12B59	6/8/06	0.055	U	0.047	U	0.12	U	0.17	U
J8-12	J12B60	6/8/06	0.028	U	0.035	U	0.074	U	0.13	U
J8-13	J12B61	6/8/06	0.035	U	0.033	U	0.085	U	0.11	U
J9-3	J12B52	6/7/06	0.083	U	0.074	U	0.22	U	0.29	U
J9-4	J12B51	6/7/06	0.039	U	0.034	U	0.092	U	0.11	U
J9-5	J12B55	6/7/06	0.042	U	0.039	U	0.095	U	0.12	U
J9-10	J12B53	6/7/06	0.061	U	0.059	U	0.13	U	0.20	U
J9-14	J12B54	6/7/06	0.052	U	0.047	U	0.11	U	0.16	U

65 Q = qualifier

66 U = undetected

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron *JMC* Date 7/31/2006
 Project 100-B/C Pipelines Field Remediation Job No. 14655
 Subject 100-B-14:1 Shallow Zone and Overburden Variance Calculations

Calc. No. 0100B-CA-V0286 Rev. No. 0
 Checked T. M. Blakley *TMB* Date 8/1/06
 Sheet No. 10 of 14

1 Statistical Evaluation of Analytical Data - Overburden (continued)

Sample Location	Sample Number	Sample Date	Cobalt-60		Cesium-137		Europium-152		Europium-154	
			pCi/g	Q	pCi/g	Q	pCi/g	Q	pCi/g	Q
J9-16	J12B50	6/7/06	0.053	U	0.053	U	0.11	U	0.20	U
J10-3	J12B49	6/7/06	0.059	U	0.062	U	0.14	U	0.21	U
J10-4	J12B48	6/7/06	0.071	U	0.073	U	0.20	U	0.23	U
J10-8	J12B47	6/7/06	0.043	U	0.056	U	0.11	U	0.14	U
J10-10	J12B46	6/7/06	0.057	U	0.055	U	0.11	U	0.17	U
J10-14	J12B45	6/7/06	0.099	U	0.086	U	0.22	U	0.31	U
J10-16	J12B44	6/7/06	0.087	U	0.088	U	0.21	U	0.30	U
K1-2	J12B28	6/7/06	0.050	U	0.049	U	0.12	U	0.15	U
K1-3	J12B29	6/7/06	0.059	U	0.065	U	0.13	U	0.23	U
K1-4	J12B27	6/7/06	0.10	U	0.088	U	0.25	U	0.30	U
K1-10	J12B31	6/7/06	0.059	U	0.047	U	0.11	U	0.16	U
K1-13	J12B30	6/7/06	0.061	U	0.061	U	0.16	U	0.20	U
K1-16	J12B26	6/7/06	0.036	U	0.039	U	0.090	U	0.12	U
K2-3	J12B35	6/7/06	0.069	U	0.067	U	0.14	U	0.21	U
K2-6	J12B34	6/7/06	0.082	U	0.078	U	0.20	U	0.29	U
K2-7	J12B36	6/7/06	0.043	U	0.042	U	0.094	U	0.14	U
K2-10	J12B32	6/7/06	0.039	U	0.042	U	0.089	U	0.16	U
K2-14	J12B33	6/7/06	0.035	U	0.033	U	0.083	U	0.10	U
K2-15	J12B37	6/7/06	0.041	U	0.042	U	0.10	U	0.13	U
K3-1	J12B38	6/7/06	0.053	U	0.053	U	0.099	U	0.16	U
K3-2	J12B41	6/7/06	0.059	U	0.046	U	0.12	U	0.18	U
K3-4	J12B43	6/7/06	0.089	U	0.081	U	0.23	U	0.31	U
K3-5	J12B39	6/7/06	0.093	U	0.089	U	0.19	U	0.33	U
K3-9	J12B40	6/7/06	0.077	U	0.076	U	0.14	U	0.25	U
K3-11	J12B42	6/7/06	0.045	U	0.039	U	0.11	U	0.15	U
K4-3	J129P1	6/12/06	0.067	U	0.074	U	0.19	U	0.23	U
K4-4	J129P2	6/12/06	0.074	U	0.050	U	0.13	U	0.24	U
K4-7	J129P3	6/12/06	0.041	U	0.041	U	0.10	U	0.16	U
K4-9	J129P0	6/12/06	0.064	U	0.073	U	0.21	U	0.25	U
K4-12	J129P4	6/12/06	0.048	U	0.046	U	0.11	U	0.16	U
K4-13	J129N9	6/12/06	0.035	U	0.036	U	0.096	U	0.13	U
L5-1	J12B21	6/7/06	0.040	U	0.039	U	0.087	U	0.13	U
L5-2	J12B20	6/7/06	0.064	U	0.055	U	0.12	U	0.19	U
L5-5	J12B22	6/7/06	0.085	U	0.077	U	0.23	U	0.28	U
L5-7	J12B23	6/7/06	0.064	U	0.068	U	0.14	U	0.24	U
L5-13	J12B24	6/7/06	0.063	U	0.058	U	0.14	U	0.20	U
L5-15	J12B25	6/7/06	0.038	U	0.098		0.090	U	0.14	U
L6-1	J12B04	6/7/06	0.048	U	0.044	U	0.11	U	0.13	U
L6-10	J12B02	6/7/06	0.054	U	0.056	U	0.13	U	0.21	U
L6-12	J12B06	6/7/06	0.065	U	0.081	U	0.15	U	0.25	U
L6-13	J12B03	6/7/06	0.056	U	0.052	U	0.11	U	0.19	U
L6-15	J12B05	6/7/06	0.075	U	0.068	U	0.17	U	0.23	U
L6-16	J12B07	6/7/06	0.060	U	0.062	U	0.14	U	0.19	U
L7-1	J12B08	6/7/06	0.044	U	0.086	U	0.081	U	0.14	U
L7-3	J12B13	6/7/06	0.063	U	0.058	U	0.12	U	0.19	U
L7-4	J12B12	6/7/06	0.061	U	0.066	U	0.14	U	0.17	U
L7-5	J12B09	6/7/06	0.041	U	0.268		0.12	U	0.13	U
L7-8	J12B11	6/7/06	0.094	U	0.076	U	0.16	U	0.25	U
L7-11	J12B10	6/7/06	0.11	U	0.093	U	0.21	U	0.27	U
L8-2	J12B14	6/7/06	0.063	U	0.069	U	0.16	U	0.22	U
L8-3	J12B16	6/7/06	0.10	U	0.079	U	0.18	U	0.32	U
L8-4	J12B17	6/7/06	0.063	U	0.059	U	0.13	U	0.16	U
L8-8	J12B18	6/7/06	0.050	U	0.046	U	0.11	U	0.16	U
L8-12	J12B19	6/7/06	0.085	U	0.063	U	0.15	U	0.27	U
L8-13	J12B15	6/7/06	0.068	U	0.066	U	0.15	U	0.23	U
M9-3	J129Y6	6/7/06	0.078	U	0.070	U	0.15	U	0.27	U
M9-4	J129Y7	6/7/06	0.055	U	0.053	U	0.11	U	0.20	U
M9-5	J12B01	6/7/06	0.064	U	0.073	U	0.14	U	0.24	U
M9-10	J129Y9	6/7/06	0.095	U	0.081	U	0.22	U	0.27	U
M9-14	J12B00	6/7/06	0.074	U	0.070	U	0.17	U	0.24	U
M9-16	J129Y8	6/7/06	0.047	U	0.043	U	0.11	U	0.13	U

65 Q = qualifier

66 U = undetected

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron Date 7/31/2006
 Project 100-B/C Pipelines Field Remediation Job No. 14655
 Subject 100-B-14:1 Shallow Zone and Overburden Variance Calculations

Calc. No. 0100B-CA-V0286 Rev. No. 0
 Checked T. M. Blakley Date 7/1/06
 Sheet No. 11 of 14

1 Statistical Evaluation of Analytical Data - Overburden (continued)

Sample Location	Sample Number	Sample Date	Cobalt-60		Cesium-137		Europium-152		Europium-154	
			pCi/g	Q	pCi/g	Q	pCi/g	Q	pCi/g	Q
M10-3	J129Y5	6/7/06	0.069	U	0.073	U	0.20	U	0.25	U
M10-4	J129Y4	6/7/06	0.040	U	0.048	U	0.11	U	0.15	U
M10-8	J129Y3	6/7/06	0.058	U	0.066	U	0.16	U	0.16	U
M10-10	J129Y0	6/7/06	0.082	U	0.067	U	0.13	U	0.22	U
M10-14	J129Y1	6/7/06	0.069	U	0.072	U	0.20	U	0.25	U
M10-16	J129Y2	6/7/06	0.043	U	0.041	U	0.10	U	0.12	U
M1-2	J129X4	6/7/06	0.089	U	0.10	U	0.26	U	0.29	U
M1-3	J129X9	6/7/06	0.050	U	0.052	U	0.096	U	0.18	U
M1-4	J129X8	6/7/06	0.034	U	0.038	U	0.081	U	0.11	U
M1-10	J129X5	6/7/06	0.045	U	0.042	U	0.11	U	0.15	U
M1-13	J129X6	6/7/06	0.044	U	0.044	U	0.088	U	0.14	U
M1-16	J129X7	6/7/06	0.066	U	0.061	U	0.17	U	0.22	U
M2-3	J128T2	6/5/06	0.065	U	0.058	U	0.14	U	0.22	U
M2-6	J12995	6/5/06	0.046	U	0.050	U	0.10	U	0.16	U
M2-7	J128T3	6/5/06	0.059	U	0.045	U	0.11	U	0.19	U
M2-10	J12996	6/5/06	0.039	U	0.040	U	0.10	U	0.13	U
M2-14	J12997	6/5/06	0.083	U	0.085	U	0.19	U	0.37	U
M2-15	J128T4	6/5/06	0.041	U	0.043	U	0.087	U	0.12	U
N3-1	J128R6	6/5/06	0.060	U	0.546		0.14	U	0.21	U
N3-2	J128T1	6/5/06	0.11	U	0.166		0.24	U	0.34	U
N3-4	J128R9	6/5/06	0.074	U	0.076	U	0.16	U	0.22	U
N3-5	J128R8	6/5/06	0.094	U	0.087	U	0.20	U	0.33	U
N3-9	J128R7	6/5/06	0.070	U	0.059	U	0.13	U	0.19	U
N3-11	J128T0	6/5/06	0.042	U	0.040	U	0.091	U	0.13	U
N4-3	J128R2	6/5/06	0.043	U	0.048	U	0.10	U	0.17	U
N4-4	J128R5	6/5/06	0.059	U	0.061	U	0.14	U	0.22	U
N4-7	J128R4	6/5/06	0.091	U	0.075	U	0.20	U	0.28	U
N4-9	J128R1	6/5/06	0.063	U	0.067	U	0.13	U	0.22	U
N4-12	J128R3	6/5/06	0.041	U	0.040	U	0.10	U	0.12	U
N4-13	J128R0	6/5/06	0.081	U	0.056	U	0.16	U	0.25	U
N5-1	J128P6	6/5/06	0.060	U	0.063	U	0.14	U	0.17	U
N5-2	J128P4	6/5/06	0.079	U	0.086	U	0.18	U	0.26	U
N5-5	J128P7	6/5/06	0.10	U	0.085	U	0.20	U	0.35	U
N5-7	J128P5	6/5/06	0.051	U	0.048	U	0.10	U	0.20	U
N5-13	J128P8	6/5/06	0.067	U	0.059	U	0.13	U	0.19	U
N5-15	J128P9	6/5/06	0.049	U	0.047	U	0.11	U	0.20	U
N6-1	J128P3	6/5/06	0.11	U	0.094	U	0.22	U	0.36	U
N6-10	J128P2	6/5/06	0.042	U	0.041	U	0.089	U	0.13	U
N6-12	J128N9	6/5/06	0.058	U	0.054	U	0.097	U	0.18	U
N6-13	J128P1	6/5/06	0.053	U	0.056	U	0.13	U	0.19	U
N6-15	J128P0	6/5/06	0.077	U	0.070	U	0.17	U	0.27	U
N6-16	J128N8	6/5/06	0.061	U	0.069	U	0.20	U	0.25	U
O7-1	J128L2	6/5/06	0.035	U	0.036	U	0.078	U	0.12	U
O7-3	J128L6	6/5/06	0.050	U	0.046	U	0.090	U	0.16	U
O7-4	J128L5	6/5/06	0.053	U	0.060	U	0.12	U	0.20	U
O7-5	J128L4	6/5/06	0.083	U	0.074	U	0.19	U	0.26	U
O7-8	J128L3	6/5/06	0.032	U	0.033	U	0.083	U	0.11	U
O7-11	J128L0	6/5/06	0.054	U	0.053	U	0.11	U	0.18	U
O8-2	J128L8	6/5/06	0.086	U	0.081	U	0.21	U	0.24	U
O8-3	J128M2	6/5/06	0.095	U	0.083	U	0.23	U	0.29	U
O8-4	J128M1	6/5/06	0.047	U	0.041	U	0.11	U	0.16	U
O8-8	J128M0	6/5/06	0.048	U	0.040	U	0.095	U	0.15	U
O8-12	J128L7	6/5/06	0.056	U	0.056	U	0.13	U	0.17	U
O8-13	J128L9	6/5/06	0.082	U	0.072	U	0.14	U	0.19	U
O9-3	J128M8	6/5/06	0.092	U	0.084	U	0.22	U	0.26	U
O9-4	J128M9	6/5/06	0.082	U	0.066	U	0.17	U	0.28	U
O9-5	J128M5	6/5/06	0.056	U	0.063	U	0.12	U	0.20	U
O9-10	J128M6	6/5/06	0.051	U	0.048	U	0.12	U	0.16	U
O9-14	J128M4	6/5/06	0.090	U	0.066	U	0.16	U	0.30	U
O9-16	J128N0	6/5/06	0.056	U	0.053	U	0.11	U	0.18	U
O10-3	J128N1	6/5/06	0.049	U	0.045	U	0.10	U	0.14	U

65 Q = qualifier

66 U = undetected

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron *JMC* Date 7/31/2006
 Project 100-B/C Pipelines Field Remediation Job No. 14655
 Subject 100-B-14:1 Shallow Zone and Overburden Variance Calculations

Calc. No. 0100B-CA-V0286 Rev. No. 0
 Checked T. M. Blakley *TMB* Date 8/1/06
 Sheet No. 12 of 14

1 Statistical Evaluation of Analytical Data - Overburden (continued)

Sample Location	Sample Number	Sample Date	Cobalt-60		Cesium-137		Europium-152		Europium-154	
			pCi/g	Q	pCi/g	Q	pCi/g	Q	pCi/g	Q
O10-4	J128N3	6/5/06	0.070	U	0.048	U	0.13	U	0.22	U
O10-8	J128N2	6/5/06	0.060	U	0.059	U	0.17	U	0.20	U
O10-10	J128N6	6/5/06	0.035	U	0.034	U	0.087	U	0.11	U
O10-14	J128N5	6/5/06	0.033	U	0.032	U	0.071	U	0.12	U
O10-16	J128N7	6/5/06	0.098	U	0.080	U	0.23	U	0.30	U
P1-2	J128H4	5/31/06	0.033	U	0.032	U	0.082	U	0.093	U
P1-3	J128H5	5/31/06	0.073	U	0.075	U	0.19	U	0.25	U
P1-4	J128H6	5/31/06	0.084	U	0.061	U	0.14	U	0.25	U
P1-10	J128H7	5/31/06	0.073	U	0.059	U	0.13	U	0.20	U
P1-13	J128H8	5/31/06	0.053	U	0.043	U	0.14	U	0.17	U
P1-16	J128H9	5/31/06	0.045	U	0.043	U	0.098	U	0.12	U
P2-3	J128J1	6/1/06	0.048	U	0.066	U	0.13	U	0.19	U
P2-6	J128J2	6/1/06	0.051	U	0.047	U	0.11	U	0.17	U
P2-7	J128J3	6/1/06	0.042	U	0.035	U	0.088	U	0.12	U
P2-10	J128J4	6/1/06	0.057	U	0.052	U	0.12	U	0.18	U
P2-14	J128J5	6/1/06	0.048	U	0.046	U	0.088	U	0.11	U
P2-15	J128J6	6/1/06	0.046	U	0.040	U	0.11	U	0.12	U
P3-1	J128J7	6/1/06	0.060	U	0.060	U	0.17	U	0.19	U
P3-2	J128J8	6/1/06	0.052	U	0.059	U	0.14	U	0.21	U
P3-4	J128J9	6/1/06	0.045	U	0.042	U	0.091	U	0.17	U
P3-5	J128K0	6/1/06	0.046	U	0.043	U	0.10	U	0.14	U
P3-9	J128K1	6/1/06	0.066	U	0.059	U	0.17	U	0.22	U
P3-11	J128K2	6/1/06	0.055	U	0.050	U	0.12	U	0.18	U
P4-3	J128K5	6/5/06	0.083	U	0.060	U	0.14	U	0.24	U
P4-4	J128K3	6/5/06	0.063	U	0.066	U	0.18	U	0.23	U
P4-7	J128K6	6/5/06	0.059	U	0.065	U	0.12	U	0.23	U
P4-9	J128K8	6/5/06	0.042	U	0.042	U	0.10	U	0.14	U
P4-12	J128K7	6/5/06	0.042	U	0.042	U	0.11	U	0.17	U
P4-13	J128K9	6/5/06	0.067	U	0.063	U	0.17	U	0.20	U
Q5-1	J128F7	5/31/06	0.057	U	0.051	U	0.12	U	0.19	U
Q5-2	J128F8	5/31/06	0.048	U	0.041	U	0.13	U	0.15	U
Q5-5	J128F9	5/31/06	0.033	U	0.036	U	0.094	U	0.12	U
Q5-7	J128H0	5/31/06	0.063	U	0.055	U	0.14	U	0.20	U
Q5-13	J128H1	5/31/06	0.069	U	0.067	U	0.19	U	0.26	U
Q5-15	J128H2	5/31/06	0.060	U	0.052	U	0.13	U	0.19	U
Q6-1	J12873	5/30/06	0.038	U	0.036	U	0.095	U	0.12	U
Q6-10	J12874	5/30/06	0.069	U	0.062	U	0.17	U	0.20	U
Q6-12	J12875	5/30/06	0.054	U	0.048	U	0.11	U	0.20	U
Q6-13	J12876	5/30/06	0.041	U	0.033	U	0.12	U	0.14	U
Q6-15	J12877	5/30/06	0.034	U	0.037	U	0.086	U	0.12	U
Q6-16	J12878	5/30/06	0.064	U	0.061	U	0.16	U	0.21	U
Q7-1	J12825	5/30/06	0.045	U	0.039	U	0.16	U	0.14	U
Q7-3	J12826	5/30/06	0.042	U	0.043	U	0.12	U	0.14	U
Q7-4	J12827	5/30/06	0.065	U	0.071	U	0.19	U	0.23	U
Q7-5	J12828	5/30/06	0.036	U	0.036	U	0.090	U	0.11	U
Q7-8	J12829	5/30/06	0.054	U	0.041	U	0.11	U	0.14	U
Q7-11	J12830	5/30/06	0.078	U	0.062	U	0.19	U	0.25	U
Q8-2	J12831	5/30/06	0.043	U	0.039	U	0.097	U	0.14	U
Q8-3	J12832	5/30/06	0.065	U	0.054	U	0.12	U	0.21	U
Q8-4	J12833	5/30/06	0.056	U	0.040	U	0.11	U	0.15	U
Q8-8	J12834	5/30/06	0.080	U	0.075	U	0.20	U	0.26	U
Q8-12	J12835	5/30/06	0.044	U	0.042	U	0.11	U	0.15	U
Q8-13	J12836	5/30/06	0.071	U	0.061	U	0.13	U	0.20	U
R9-3	J12849	5/30/06	0.035	U	0.039	U	0.090	U	0.15	U
R9-4	J12850	5/30/06	0.083	U	0.069	U	0.16	U	0.24	U
R9-5	J12851	5/30/06	0.073	U	0.070	U	0.13	U	0.22	U
R9-10	J12852	5/30/06	0.054	U	0.046	U	0.15	U	0.18	U
R9-14	J12853	5/30/06	0.069	U	0.074	U	0.15	U	0.26	U
R9-16	J12854	5/30/06	0.049	U	0.058	U	0.13	U	0.23	U
R10-3	J12855	5/30/06	0.055	U	0.052	U	0.13	U	0.14	U
R10-4	J12856	5/30/06	0.064	U	0.084	U	0.18	U	0.26	U

65 Q = qualifier

66 U = undetected

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron *JMC* Date 7/31/2006
 Project 100-B/C Pipelines Field Remediation Job No. 14655
 Subject 100-B-14:1 Shallow Zone and Overburden Variance Calculations

Calc. No. 0100B-CA-V0286 Rev. No. 0
 Checked T. M. Blakley *TMB* Date 8/1/06
 Sheet No. 13 of 14

1 Statistical Evaluation of Analytical Data - Overburden (continued)

Sample Location	Sample Number	Sample Date	Cobalt-60		Cesium-137		Europium-152		Europium-154	
			pCi/g	Q	pCi/g	Q	pCi/g	Q	pCi/g	Q
R10-8	J12857	5/30/06	0.064	U	0.058	U	0.14	U	0.22	U
R10-10	J12858	5/30/06	0.055	U	0.049	U	0.14	U	0.17	U
R10-14	J12859	5/30/06	0.081	U	0.077	U	0.19	U	0.30	U
R10-16	J12860	5/30/06	0.083	U	0.075	U	0.16	U	0.27	U
R1-2	J12837	5/30/06	0.072	U	0.060	U	0.18	U	0.23	U
R1-3	J12838	5/30/06	0.036	U	0.036	U	0.092	U	0.12	U
R1-4	J12839	5/30/06	0.056	U	0.053	U	0.13	U	0.19	U
R1-10	J12840	5/30/06	0.048	U	0.048	U	0.12	U	0.16	U
R1-13	J12841	5/30/06	0.077	U	0.078	U	0.21	U	0.27	U
R1-16	J12842	5/30/06	0.031	U	0.040	U	0.11	U	0.13	U
R2-3	J12843	5/30/06	0.066	U	0.062	U	0.15	U	0.25	U
R2-6	J12844	5/30/06	0.051	U	0.045	U	0.12	U	0.18	U
R2-7	J12845	5/30/06	0.074	U	0.058	U	0.14	U	0.24	U
R2-10	J12846	5/30/06	0.048	U	0.045	U	0.12	U	0.15	U
R2-14	J12847	5/30/06	0.027	U	0.026	U	0.066	U	0.084	U
R2-15	J12848	5/30/06	0.033	U	0.028	U	0.084	U	0.11	U
S3-1	J12861	5/30/06	0.059	U	0.063	U	0.14	U	0.24	U
S3-2	J12862	5/30/06	0.062	U	0.048	U	0.13	U	0.17	U
S3-4	J12863	5/30/06	0.045	U	0.046	U	0.10	U	0.14	U
S3-5	J12864	5/30/06	0.086	U	0.079	U	0.20	U	0.27	U
S3-9	J12865	5/30/06	0.072	U	0.085	U	0.20	U	0.24	U
S3-11	J12866	5/30/06	0.067	U	0.065	U	0.14	U	0.25	U
S4-3	J12867	5/30/06	0.048	U	0.046	U	0.13	U	0.15	U
S4-4	J12868	5/30/06	0.033	U	0.038	U	0.09	U	0.11	U
S4-7	J12869	5/30/06	0.072	U	0.067	U	0.19	U	0.27	U
S4-9	J12870	5/30/06	0.080	U	0.076	U	0.15	U	0.23	U
S4-12	J12871	5/30/06	0.072	U	0.057	U	0.12	U	0.19	U
S4-13	J12872	5/30/06	0.046	U	0.043	U	0.13	U	0.13	U
S5-1	J12879	5/30/06	0.085	U	0.070	U	0.16	U	0.26	U
S5-2	J12880	5/30/06	0.050	U	0.059	U	0.11	U	0.21	U
S5-5	J12881	5/30/06	0.051	U	0.044	U	0.14	U	0.14	U
S5-7	J12882	5/30/06	0.044	U	0.046	U	0.11	U	0.14	U
S5-13	J12883	5/30/06	0.050	U	0.050	U	0.14	U	0.17	U
S5-15	J12884	5/30/06	0.053	U	0.051	U	0.11	U	0.17	U
S6-1	J12BR2	6/19/06	0.036	U	0.038	U	0.10	U	0.12	U
S6-10	J12BR3	6/19/06	0.061	U	0.065	U	0.16	U	0.20	U
S6-12	J12BR4	6/19/06	0.047	U	0.041	U	0.095	U	0.15	U
S6-13	J12BR1	6/19/06	0.041	U	0.103		0.10	U	0.14	U
S6-15	J12BR0	6/19/06	0.057	U	0.045	U	0.11	U	0.16	U
S6-16	J12BP9	6/19/06	0.071	U	0.064	U	0.18	U	0.21	U
T7-1	J12BP4	6/19/06	0.045	U	0.048	U	0.13	U	0.16	U
T7-3	J12BP5	6/19/06	0.072	U	0.077	U	0.21	U	0.27	U
T7-4	J12BP6	6/19/06	0.053	U	0.047	U	0.13	U	0.19	U
T7-5	J12BP3	6/19/06	0.059	U	0.049	U	0.12	U	0.14	U
T7-8	J12BP7	6/19/06	0.046	U	0.039	U	0.091	U	0.15	U
T7-11	J12BP8	6/19/06	0.041	U	0.037	U	0.092	U	0.12	U
T8-2	J12BN8	6/19/06	0.079	U	0.070	U	0.16	U	0.29	U
T8-3	J12BN9	6/19/06	0.060	U	0.062	U	0.12	U	0.16	U
T8-4	J12BP0	6/19/06	0.045	U	0.046	U	0.11	U	0.13	U
T8-8	J12BP1	6/19/06	0.065	U	0.073	U	0.20	U	0.25	U
T8-12	J12BP2	6/19/06	0.075	U	0.066	U	0.15	U	0.22	U
T8-13	J12BN7	6/19/06	0.080	U	0.077	U	0.21	U	0.29	U
T9-3	J12BN5	6/19/06	0.044	U	0.043	U	0.090	U	0.15	U
T9-4	J12BN6	6/19/06	0.046	U	0.047	U	0.11	U	0.13	U
T9-5	J12BN4	6/19/06	0.079	U	0.082	U	0.18	U	0.28	U
T9-10	J12BN3	6/19/06	0.077	U	0.081	U	0.19	U	0.26	U
T9-14	J12BN1	6/19/06	0.047	U	0.050	U	0.096	U	0.17	U
T9-16	J12BN2	6/19/06	0.037	U	0.039	U	0.096	U	0.13	U
T10-3	J12BN0	6/19/06	0.060	U	0.055	U	0.13	U	0.16	U
T10-4	J12BM9	6/19/06	0.058	U	0.064	U	0.19	U	0.22	U
T10-8	J12BM8	6/19/06	0.045	U	0.058	U	0.11	U	0.15	U

65 Q = qualifier

66 U = undetected

CALCULATION SHEET

Washington Closure HanfordOriginator J. M. Capron *JMC*

Date 7/31/2006

Calc. No. 0100B-CA-V0286

Rev. No. 0

Project 100-B/C Pipelines Field Remediation

Job No. 14655

Checked T. M. Blakley *TMB*

Date 8/1/06

Subject 100-B-14:1 Shallow Zone and Overburden Variance Calculations

Sheet No. 14 of 14

1 Statistical Evaluation of Analytical Data - Overburden (continued)

Sample Location	Sample Number	Sample Date	Cobalt-60		Cesium-137		Europium-152		Europium-154	
			pCi/g	Q	pCi/g	Q	pCi/g	Q	pCi/g	Q
T10-10	J12BM6	6/19/06	0.056	U	0.065	U	0.15	U	0.23	U
T10-14	J12BM5	6/19/06	0.071	U	0.073	U	0.19	U	0.21	U
T10-16	J12BM7	6/19/06	0.046	U	0.045	U	0.093	U	0.15	U
U1-2	J12BM4	6/19/06	0.077	U	0.076	U	0.19	U	0.25	U
U1-3	J12BM3	6/19/06	0.034	U	0.037	U	0.088	U	0.12	U
U1-4	J12BM2	6/19/06	0.043	U	0.040	U	0.084	U	0.14	U
U1-10	J12BM0	6/19/06	0.055	U	0.10	U	0.16	U	0.20	U
U1-13	J12BL9	6/19/06	0.043	U	0.041	U	0.10	U	0.15	U
U1-16	J12BM1	6/19/06	0.051	U	0.044	U	0.096	U	0.15	U
U2-3	J12BL6	6/19/06	0.064	U	0.071	U	0.18	U	0.20	U
U2-6	J12BL7	6/19/06	0.061	U	0.064	U	0.13	U	0.21	U
U2-7	J12BL5	6/19/06	0.048	U	0.083	U	0.11	U	0.14	U
U2-10	J12BL8	6/19/06	0.047	U	0.040	U	0.091	U	0.16	U
U2-14	J12BL3	6/19/06	0.080	U	0.12	U	0.16	U	0.25	U
U2-15	J12BL4	6/19/06	0.053	U	0.051	U	0.096	U	0.18	U
U3-1	J12BL0	6/19/06	0.051	U	0.055	U	0.11	U	0.17	U
U3-2	J12BL1	6/19/06	0.049	U	0.042	U	0.11	U	0.14	U
U3-4	J12BL2	6/19/06	0.071	U	0.078	U	0.21	U	0.25	U
U3-5	J12BK9	6/19/06	0.070	U	0.062	U	0.14	U	0.20	U
U3-9	J12BK8	6/19/06	0.077	U	0.089	U	0.22	U	0.27	U
U3-11	J12BK7	6/19/06	0.047	U	0.045	U	0.11	U	0.14	U
U4-3	J12BK5	6/19/06	0.054	U	0.057	U	0.14	U	0.18	U
U4-4	J12BK6	6/19/06	0.053	U	0.047	U	0.098	U	0.19	U
U4-7	J12BK4	6/19/06	0.090	U	0.085	U	0.23	U	0.31	U
U4-9	J12BK2	6/19/06	0.054	U	0.046	U	0.12	U	0.17	U
U4-12	J12BK3	6/19/06	0.073	U	0.081	U	0.19	U	0.26	U
U4-13	J12BK1	6/19/06	0.049	U	0.044	U	0.11	U	0.14	U
V5-1	J12BJ9	6/19/06	0.087	U	0.068	U	0.15	U	0.26	U
V5-2	J12BJ8	6/19/06	0.090	U	0.091	U	0.23	U	0.32	U
V5-5	J12BK0	6/19/06	0.060	U	0.050	U	0.12	U	0.23	U
V5-7	J12BJ7	6/19/06	0.042	U	0.040	U	0.095	U	0.11	U
V5-13	J12BJ5	6/19/06	0.075	U	0.065	U	0.16	U	0.22	U
V5-15	J12BJ6	6/19/06	0.050	U	0.050	U	0.11	U	0.20	U
V6-1	J12BJ1	6/19/06	0.048	U	0.052	U	0.13	U	0.19	U
V6-10	J12BH9	6/19/06	0.071	U	0.059	U	0.15	U	0.27	U
V6-12	J12BJ4	6/19/06	0.081	U	0.081	U	0.21	U	0.29	U
V6-13	J12BJ0	6/19/06	0.094	U	0.089	U	0.22	U	0.32	U
V6-15	J12BJ2	6/19/06	0.051	U	0.050	U	0.11	U	0.14	U
V6-16	J12BJ3	6/19/06	0.041	U	0.039	U	0.10	U	0.14	U
V7-1	J12BH4	6/19/06	0.091	U	0.087	U	0.21	U	0.28	U
V7-3	J12BH5	6/19/06	0.076	U	0.056	U	0.13	U	0.21	U
V7-4	J12BH7	6/19/06	0.040	U	0.042	U	0.10	U	0.13	U
V7-5	J12BH3	6/19/06	0.036	U	0.037	U	0.091	U	0.11	U
V7-8	J12BH8	6/19/06	0.078	U	0.076	U	0.22	U	0.26	U
V7-11	J12BH6	6/19/06	0.054	U	0.052	U	0.12	U	0.20	U
V8-2	J12BF8	6/19/06	0.042	U	0.037	U	0.090	U	0.15	U
V8-3	J12BF9	6/19/06	0.041	U	0.048	U	0.11	U	0.14	U
V8-4	J12BH1	6/19/06	0.058	U	0.049	U	0.13	U	0.23	U
V8-8	J12BH0	6/19/06	0.069	U	0.070	U	0.18	U	0.24	U
V8-12	J12BH2	6/19/06	0.035	U	0.036	U	0.086	U	0.15	U
V8-13	J12BF7	6/19/06	0.060	U	0.051	U	0.14	U	0.20	U
Mean (LV) =====>			0.06		0.06		0.13		0.19	
Standard deviation (S) =====>			0.02		0.03		0.04		0.06	
Z _{1-α} (α=5%) =====>			1.645		1.645		1.645		1.645	
Z _{1-β} (β=20%) =====>			0.842		0.842		0.842		0.842	
Number of samples =====>			1		1		1		1	

60 LV = likely value

61 Q = qualifier

62 S = standard deviation

63 U = undetected

CALCULATION COVER SHEET

Project Title:	100-B/C Remaining Pipes and Sewers Field Remediation	Job No.	14655
Area	100-B/C		
Discipline	Environmental	*Calc. No.	0100B-CA-V0287
Subject	100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations		
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 Sheets = 16 Attn. 1 = 12 Attn. 2 = 1 Total = 30	<i>Signed</i> 11/7/2006 J. M. Capron	<i>Signed</i> 11/8/2006 W. S. Thompson	N/A	<i>Signed</i> 11/9/2006 D. N. Strom	<i>Approved</i> 11/9/2006
1	Cover = 1 Sheets = 16 Attn. 1 = 12 Attn. 2 = 1 Total = 30 34	<i>J. M. Capron</i> 1/12/07 J. M. Capron	<i>S. W. Clark</i> 4/15/07 S. W. Clark	N/A	<i>D. N. Strom</i> 1-16-07 D. N. Strom	1-16-07
SUMMARY OF REVISIONS						
1	Replaced cover page for convenience. Revised sheets 1, 3, 4, 5, 6, and 7 to include calculations and related description for carbon-14. Added sheets 12A, 12B, 12C, and 12D to include calculations for carbon-14 in overburden soils.					

WCH-DE-018 (9/01/2006)

* Obtain Calc. No. from R&DC and Form from Intranet

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron *JMC* Date 01/12/07 Calc. No. 0100B-CA-V0287 Rev. No. 1
 Project 100-B/C Remaining Pipes and Sewers Field Remediation Job No. 14655 Checked S. W. Clark *SWC* Date 1/15/07
 Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations Sheet No. 1 of 16

Summary**Purpose:**

Calculate the 95% upper confidence limit (UCL) values to evaluate compliance with cleanup standards for the subject site. Also, perform the *Washington Administrative Code* (WAC) 173-340-740(7)(e) 3-part test for each nonradioactive contaminant of concern (COC), calculate hazard quotient and excess carcinogenic risk for nonradionuclide COCs, and calculate the relative percent difference (RPD) for primary-duplicate and primary-split sample pairs, as necessary.

Table of Contents:

Sheets 1 to 3 - Calculation Sheet Summary
 Sheets 4 to 6 - 100-B-14:1 Remediation Footprint Shallow Zone Verification Data Evaluation
 Sheet 7 - 100-B-14:1 Remediation Footprint Deep Zone Verification Data Evaluation
 Sheets 8 to 12 - 100-B-14:1 Overburden Verification Data Evaluation
 Sheets 12A to 12D - 100-B-14:1 OB01, OB02, OB03, OB04, OB05, and OB06 Carbon-14 Verification Data Evaluation
 Sheet 13 - Ecology Software (MTCASat) Results
 Sheets 14 to 16 - Split/Duplicate Analysis
 Attachment 1 - 100-B-14:1 Phase I Verification Sampling Results (12 sheets)
 Attachment 2 - 100-B-14:1 Phase II Verification Sampling Results (1 sheet)

Given/References:

- 1) Sample Results (Attachments 1 and 2).
- 2) Background values and remedial action goals (RAGs) are taken from DOE-RL (1996) and DOE-RL (2005b), respectively.
- 3) DOE-RL, 1996, *Hanford Site Background: Part 2, Soil Background for Radionuclides*, DOE/RL-96-12, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- 4) 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.
- 5) 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.
- 6) Ecology, 1992, *Statistical Guidance for Ecology Site Managers*, Publication #92-54, Washington Department of Ecology, Olympia, Washington.
- 7) Ecology, 1993, *Statistical Guidance for Ecology Site Managers, Supplement S-6, Analyzing Site or Background Data with Below-detection Limit or Below-PQL Values (Censored Data Sets)*, Publication #92-54, Washington Department of Ecology, Olympia, Washington.
- 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*.

Solution:

Calculation methodology is described in Ecology Pub. #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, excess risk calculations, and the RPD calculations, as required.

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. RPD results are used in evaluation of data quality within the RSVP for this site.

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. The 95% UCL values were calculated only for the site COCs and for analytes detected by the primary laboratory. 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 (DOE-RL 2005a). 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.

Due to detections of carbon-14 in initial verification samples collected from overburden soil stockpiles, overburden material showing the highest detections was removed and a new sampling design was developed and implemented. Results for carbon-14 from both sampling events are provided in the attached data. There is significant discrepancy in the primary, duplicate, and split sample results for the carbon-14 soil sample collected from OB01 A1, and this sample was not included in statistical calculations. Material from this area was used for backfill of deep zone areas of 100-B-14:1 only, with additional discussion presented in the RSVP.

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron *JMC* Date 11/07/06 Calc. No. 0100B-CA-V0287 Rev. No. 0
 Project 100-B/C Replacing Pipes and Sewers Field Remediation Job No. 14655 Checked W. S. Thompson Date 11/8/06
 Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations Sheet No. 2 of 16

Summary (continued)

1 All nonradionuclide data reported as being undetected are set to ½ the detection limit value for calculation of the statistics (Ecology
 2 1993). For radionuclide data, calculation of the statistics was done on the reported value. In cases where the laboratory does not
 3 report a value below the minimum detectable activity (MDA), half of the MDA is used in the calculation. For the statistical
 4 evaluation of duplicate sample pairs, the samples are averaged before being included in the data set, after adjustments for
 5 censored data as described above.

7 For nonradionuclides, the WAC 173-340 statistical guidance suggests that a test for distributional form be performed on the data
 8 and the 95% UCL calculated on the appropriate distribution using Ecology software. For nonradionuclide small data sets (n < 10)
 9 and all radionuclide data sets, the calculations are performed assuming nonparametric distribution, so no tests for distribution are
 10 performed. For nonradionuclide data sets of ten or greater, distributional testing and calculation of the 95% UCL is done using
 11 Ecology's MTCASat software (Ecology 1993). Due to differences in addressing censored data between the RDR/RAWP (DOE-RL
 12 2005b) and MTCASat coding and due to a limitation in the MTCASat coding (no direct capability to address variable quantitation
 13 limits within a data set), substitutions for censored data are performed before software input and the resulting input set treated as
 14 uncensored.

17 The hazard quotient (for shallow zone nonradionuclide COCs) is determined by dividing the statistical value (derived in this
 18 calculation) by the WAC 173-340 non-carcinogenic cleanup limit. The excess nonradionuclide carcinogenic risk is determined by
 19 dividing the statistical value by the WAC 173-340 carcinogenic cleanup limit and then multiplying by 10⁻⁶.

22 The WAC 173-340-740(7)(e) 3-part test is performed for nonradionuclide analytes only and determines if:

- 23 1) the 95% UCL exceeds the most stringent cleanup limit for each COC,
- 24 2) greater than 10% of the raw data exceed the most stringent cleanup limit for each COC,
- 25 3) the maximum value of the raw data set exceeds two times the most stringent cleanup limit for each COC.

27 The RPD is calculated when both the primary value and the duplicate (or split) value for a given analyte are above detection limits
 28 and are greater than 5 times the target detection limit (TDL). The TDL is a laboratory detection limit pre-determined for each
 29 analytical method, listed in Table II-1 of the SAP (DOE-RL 2005a). Where direct evaluation of the attached sample data showed
 30 that a given analyte was not detected in the primary and/or duplicate/split sample, further evaluation of the RPD value was not
 31 performed. The RPD calculations use the following formula:

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

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

38 For quality assurance/quality control (QA/QC) split and duplicate RPD calculations, a value less than 30% indicates the data
 39 compare favorably. For regulatory splits, a threshold of 35% is used (EPA 1994). If the RPD is greater than 30% (or 35% for
 40 regulatory split data), further investigation regarding the usability of the data is performed. To assist in the identification of
 41 anomalous sample pairs, when an analyte is detected in the primary or duplicate sample, but was quantified at less than 5 times
 42 the TDL in one or both samples, an additional parameter is evaluated. In this case, if the difference between the primary and
 43 duplicate results exceeds a control limit of 2 times the TDL, further assessment regarding the usability of the data is performed.
 44 Additional discussion is provided in the data quality assessment section of the applicable remaining sites verification package, as
 45 necessary.

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron *JMC* Date 01/12/07 Job No. 14655
 Project 100-B/C Remaining Pipes and Sewers Field Remediation
 Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

Calc. No. 0100B-CA-V0287 Rev. No. 1
 Checked S. W. Clark *SWC* Date 1/15/07
 Sheet No. 3 of 16

Summary (continued)

1 Results:
 2 The results presented in the summary tables that follow are for use in a backfill decision and closure documentation for this site.

Results Summary

Analyte	Shallow Zone		Deep Zone		Overburden		Units
	Result	Qualifier	Result	Qualifier	Result	Qualifier	
Cesium-137	0.022		0.111		0(<BG)		pCi/g
Cobalt-60	0.021	U	0.018	U	0.013	U	pCi/g
Europium-152	0.044	U	0.042	U	0.05	U	pCi/g
Europium-154	0.07	U	0.057	U	0.04	U	pCi/g
Europium-155	0.06	U	0.053	U	0.006		pCi/g
Tritium	NA ^a		-0.83	U	NA ^a	U	pCi/g
Hexavalent chromium	0.91		0.21	U	0.27		mg/kg
Analyte	OB01		OB02		OB03		Units
	Result	Qualifier	Result	Qualifier	Result	Qualifier	
Carbon-14	-0.261	U	-0.169	U	0.128	U	pCi/g
Analyte	OB04		OB05		OB06		Units
	Result	Qualifier	Result	Qualifier	Result	Qualifier	
Carbon-14	0.500	U	0.459	U	0.470	U	pCi/g

20 ^aTritium was not identified as a contaminant of concern for the shallow zone or overburden decision units.

21 NA = not applicable

22 U = undetected (in all samples submitted to the primary laboratory)

23 WAC 173-340 Evaluation (Shallow Zone)

24 3-Part Test:

25 95% UCL > Cleanup Limit? NO
 26 > 10% above Cleanup Limit? NO
 27 Any sample > 2x Cleanup Limit? NO

28
 29 All nonradionuclide COC concentrations satisfy the 3-part
 30 test criteria.

31

32 Risk Estimate:

33 Nonrad noncarcinogenic index sum: 3.8E-03
 34 Nonrad carcinogenic risk: 4.3E-07

36 WAC 173-340 Evaluation (Deep Zone)

37 3-Part Test:

38 95% UCL > Cleanup Limit? NA
 39 > 10% above Cleanup Limit? NA
 40 Any sample > 2x Cleanup Limit? NA

41 Because no nonradionuclide COCs were detected, performance of the 3-
 42 part test is not required.

43

44

Relative Percent Difference Results^a - QA/QC Analysis

Analyte	Shallow Zone	Deep Zone Duplicate	Overburden L5	Overburden L6 Duplicate
	Duplicate Analysis ^b	Analysis ^b	Duplicate Analysis ^b	Analysis ^b
Potassium-40	38%	5.5%	11%	0.73%
Radium-226	Evaluation not required	Evaluation not required	10%	14%
Analyte	Overburden M10	Overburden P2	Overburden P3	
	Duplicate Analysis ^b	Duplicate Analysis ^b	Duplicate Analysis ^b	
Potassium-40	55%	60%	9%	
Radium-226	67%	52%	Evaluation not required	

52 Note: Quantitated results for radium-228 in overburden (Phase I) Sample Area M10 and carbon-14 in overburden (Phase II)
 53 sub-unit 01, Sample Area A1 did not exceed the relative percent difference quality control threshold of 5XTDL, but the
 54 difference between the results exceeded the 2XTDL control threshold.

55 ^aRelative percent difference evaluation was not required for split samples and analytes not included in this table.

56 ^bThe significance of relative percent difference values are discussed within the RSVP for the subject site.

57 QA/QC = quality assurance/quality control

TDL = target detection limit

58 RSVP = remaining sites verification package

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron
Project 100-B/C Remaining Pipes and Sewers Field Remediation
Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

Date 01/12/07
Job No. 14655
Calc. No. 0100B-CA-V0287
Checked S. W. Clark

Rev. No. 1
Date 1/15/07
Sheet No. 4 of 16

1 100-B-14:1 Remediation Footprint Shallow Zone Verification Data

	Sample Area	Sample Number	Sample Date	Carbon-14			Cesium-137			Cobalt-60			Europium-152			Europium-154			Europium-155			Hexavalent Chromium		
				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
3	SZ B6	J127L2	5/31/2006	0.918	U	3.3	0.023	U	0.023	0.024	U	0.024	0.059	U	0.059	0.077	U	0.077	0.081	U	0.081	0.21		0.21
5	Duplicate of J127L2	J127L3	5/31/2006	-0.485	U	3.0	0.028	U	0.028	0.030	U	0.030	0.066	U	0.066	0.093	U	0.093	0.095	U	0.095	0.24		0.20
6	SZ A1	J127J2	6/1/2006	0.334	U	2.0	0.035	U	0.035	0.036	U	0.036	0.086	U	0.086	0.13	U	0.13	0.12	U	0.12	0.21	U	0.21
7	SZ A2	J127J1	6/1/2006	0.904	U	2.1	0.036	U	0.036	0.041	U	0.041	0.10	U	0.10	0.13	U	0.13	0.13	U	0.13	0.21	U	0.21
8	SZ A3	J127J0	6/1/2006	0.808	U	2.2	0.024	U	0.024	0.025	U	0.025	0.057	U	0.057	0.095	U	0.095	0.054	U	0.054	0.21	U	0.21
9	SZ A4	J127H9	6/1/2006	1.83	U	2.2	0.017	U	0.017	0.017	U	0.017	0.043	U	0.043	0.054	U	0.054	0.059	U	0.059	0.21	U	0.21
10	SZ B5	J127H8	6/1/2006	0.609	U	2.1	0.018	U	0.018	0.019	U	0.019	0.041	U	0.041	0.066	U	0.066	0.032	U	0.043	0.21	U	0.21
11	SZ B7	J127L1	5/31/2006	0.319	U	3.1	0.037	U	0.037	0.040	U	0.040	0.099	U	0.099	0.13	U	0.13	0.13	U	0.13	0.32		0.21
12	SZ B8	J127L0	5/31/2006	-0.706	U	3.0	0.031	U	0.031	0.026	U	0.026	0.063	U	0.063	0.11	U	0.11	0.058	U	0.058	0.21	U	0.21
13	SZ C9	J127K9	5/31/2006	-2.04	U	3.8	0.041	U	0.041	0.039	U	0.039	0.11	U	0.11	0.14	U	0.14	0.14	U	0.14	0.34		0.21
14	SZ C10	J127K8*	5/31/2006	0.726	U	3.2	0.055	U	0.055	0.057	U	0.057	0.14	U	0.14	0.18	U	0.18	0.17	U	0.17	0.36		0.20
15	SZ C1	J127H3	5/30/2006	0.018	U	2.6	0.045	U	0.045	0.044	U	0.044	0.094	U	0.094	0.15	U	0.15	0.11	U	0.11	0.21	U	0.21
16	SZ C2	J127H2	5/30/2006	-0.693	U	2.4	0.10	U	0.10	0.14	U	0.14	0.14	U	0.14	0.46	U	0.46	0.11	U	0.11	0.21	U	0.21
17	SZ D3	J127J3	6/1/2006	-0.197	U	2.3	0.023	U	0.023	0.025	U	0.025	0.062	U	0.062	0.074	U	0.074	0.086	U	0.086	0.21	U	0.21
18	SZ D4	J127J4	6/1/2006	0.609	U	2.0	0.042	U	0.042	0.043	U	0.043	0.11	U	0.11	0.14	U	0.14	0.14	U	0.14	0.22	U	0.22
19	SZ D5	J127L4	6/6/2006	-0.209	U	2.6	0.027	U	0.027	0.029	U	0.029	0.069	U	0.069	0.093	U	0.093	0.091	U	0.091	0.21	U	0.21
20	SZ D6	J127L5	6/6/2006	0.151	U	2.6	0.061		0.035	0.030	U	0.030	0.071	U	0.071	0.090	U	0.090	0.093	U	0.093	0.21	U	0.21
21	SZ E7	J127L6	6/6/2006	0.380	U	2.6	0.059	U	0.059	0.061	U	0.061	0.15	U	0.15	0.20	U	0.20	0.21	U	0.21	0.29		0.22
22	SZ E8	J127L7	6/6/2006	-1.11	U	2.4	0.028	U	0.028	0.036	U	0.036	0.071	U	0.071	0.12	U	0.12	0.10	U	0.10	0.31		0.21
23	SZ E9	J127L8	6/6/2006	-0.503	U	2.4	0.023	U	0.023	0.024	U	0.024	0.055	U	0.055	0.084	U	0.084	0.050	U	0.050	0.27		0.21
24	SZ E10	J127L9	6/6/2006	-1.42	U	2.4	0.024	U	0.024	0.026	U	0.026	0.066	U	0.066	0.088	U	0.088	0.086	U	0.086	0.21	U	0.21
25	SZ F1	J127M3	6/7/2006	-0.820	U	1.9	0.026	U	0.026	0.032	U	0.032	0.064	U	0.064	0.12	U	0.12	0.094	U	0.094	0.21	U	0.21
26	SZ F2	J127M0	6/6/2006	0.038	U	2.6	0.053	U	0.053	0.058	U	0.058	0.14	U	0.14	0.19	U	0.19	0.20	U	0.20	0.42		0.22
27	SZ F3	J127M1	6/6/2006	-0.705	U	2.5	0.026	U	0.026	0.028	U	0.028	0.066	U	0.066	0.084	U	0.084	0.091	U	0.091	0.28		0.21
28	SZ F4	J127M2	6/6/2006	-0.265	U	2.6	0.025	U	0.025	0.027	U	0.027	0.058	U	0.058	0.097	U	0.097	0.053	U	0.053	0.31		0.21
29	SZ G5	J127P4	6/8/2006	0.253	U	3.0	0.016	U	0.016	0.017	U	0.017	0.045	U	0.045	0.057	U	0.057	0.084	U	0.084	0.37		0.21
30	SZ G6	J127P5	6/8/2006	-0.622	U	2.8	0.013	U	0.013	0.013	U	0.013	0.029	U	0.029	0.043	U	0.043	0.058	U	0.058	0.21	U	0.21
31	SZ G7	J127P6**	6/8/2006	0.082	U	3.0	0.010	U	0.010	0.010	U	0.010	0.022	U	0.022	0.037	U	0.037	0.050	U	0.050	0.23		0.21
32	SZ G8	J127P9	6/8/2006	1.06	U	3.0	0.024	U	0.024	0.036	U	0.036	0.058	U	0.058	0.075	U	0.075	0.080	U	0.080	0.91		0.25
33	SZ H9	J127P7	6/8/2006	-0.434	U	2.9	0.010	U	0.010	0.009	U	0.009	0.023	U	0.023	0.030	U	0.030	0.049	U	0.049	0.21	U	0.21
34	SZ H10	J127P8	6/8/2006	-0.394	U	2.6	0.024	U	0.024	0.023	U	0.023	0.048	U	0.048	0.077	U	0.077	0.047	U	0.047	0.39		0.21
35	SZ H1	J127R0	6/8/2006	0.117	U	2.8	0.046	U	0.046	0.060	U	0.060	0.12	U	0.12	0.17	U	0.17	0.17	U	0.17	0.21	U	0.21
36	SZ H2	J127R1***	6/8/2006	-0.426	U	2.8	0.073	U	0.073	0.042	U	0.042	0.11	U	0.11	0.14	U	0.14	0.16	U	0.16	0.33		0.21

37 *Sample J13HF3 replaced hexavalent chromium data for sample J127K8.

38 **Sample J13HF4 replaced carbon-14 data for sample J127P6.

39 ***Sample J13HF5 replaced carbon-14 data for sample J127R1.

40 MDA = minimum detectable activity

41 PQL = practical quantitation limit

Q = qualifier

U = undetected

SZ = shallow zone

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron
Project 100-B/C Remaining Pipes and Sewers Field Remediation
Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

Date 01/12/07
Job No. 14655
Calc. No. 0100B-CA-V0287
Checked S. W. Clark

Rev. No. 1
Date 1/15/07
Sheet No. 5 of 16

1 100-B-14:1 Remediation Footprint Shallow Zone Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Carbon-14 pCi/g	Cesium-137 pCi/g	Cobalt-60 pCi/g	Europium-152 pCi/g	Europium-154 pCi/g	Europium-155 pCi/g	Hexavalent Chromium mg/kg
SZ B6	J127L2/J127L3	5/31/2006	0.217	0.013	0.014	0.031	0.043	0.044	0.23
SZ A1	J127J2	6/1/2006	0.334	0.018	0.018	0.043	0.065	0.060	0.11
SZ A2	J127J1	6/1/2006	0.904	0.018	0.021	0.050	0.065	0.065	0.11
SZ A3	J127J0	6/1/2006	0.808	0.012	0.013	0.029	0.048	0.027	0.11
SZ A4	J127H9	6/1/2006	1.83	0.0085	0.0085	0.022	0.027	0.030	0.11
SZ B5	J127H8	6/1/2006	0.609	0.0090	0.010	0.021	0.033	0.032	0.11
SZ B7	J127L1	5/31/2006	0.319	0.019	0.020	0.050	0.065	0.065	0.32
SZ B8	J127L0	5/31/2006	-0.706	0.016	0.013	0.032	0.055	0.029	0.11
SZ C9	J127K9	5/31/2006	-2.04	0.021	0.020	0.055	0.070	0.070	0.34
SZ C10	J127K8*	5/31/2006	0.726	0.028	0.029	0.070	0.090	0.085	0.36
SZ C1	J127H3	5/30/2006	0.018	0.023	0.022	0.047	0.075	0.055	0.11
SZ C2	J127H2	5/30/2006	-0.693	0.050	0.070	0.070	0.23	0.055	0.11
SZ D3	J127J3	6/1/2006	-0.197	0.012	0.013	0.031	0.037	0.043	0.11
SZ D4	J127J4	6/1/2006	0.609	0.021	0.022	0.055	0.070	0.070	0.11
SZ D5	J127L4	6/6/2006	-0.209	0.014	0.015	0.035	0.047	0.046	0.11
SZ D6	J127L5	6/6/2006	0.151	0.061	0.015	0.036	0.045	0.047	0.11
SZ E7	J127L6	6/6/2006	0.380	0.030	0.031	0.075	0.10	0.11	0.29
SZ E8	J127L7	6/6/2006	-1.11	0.014	0.018	0.036	0.060	0.050	0.31
SZ E9	J127L8	6/6/2006	-0.503	0.012	0.012	0.028	0.042	0.025	0.27
SZ E10	J127L9	6/6/2006	-1.42	0.012	0.013	0.033	0.044	0.043	0.11
SZ F1	J127M3	6/7/2006	-0.820	0.013	0.016	0.032	0.060	0.047	0.11
SZ F2	J127M0	6/6/2006	0.038	0.027	0.029	0.070	0.095	0.10	0.42
SZ F3	J127M1	6/6/2006	-0.705	0.013	0.014	0.033	0.042	0.046	0.28
SZ F4	J127M2	6/6/2006	-0.265	0.013	0.014	0.029	0.049	0.027	0.31
SZ G5	J127P4	6/8/2006	0.253	0.0080	0.0085	0.023	0.029	0.042	0.37
SZ G6	J127P5	6/8/2006	-0.622	0.0065	0.0065	0.015	0.022	0.029	0.11
SZ G7	J127P6**	6/8/2006	0.082	0.0050	0.0050	0.011	0.019	0.025	0.23
SZ G8	J127P9	6/8/2006	1.06	0.012	0.018	0.029	0.038	0.040	0.91
SZ H9	J127P7	6/8/2006	-0.434	0.0050	0.0045	0.012	0.015	0.025	0.11
SZ H10	J127P8	6/8/2006	-0.394	0.012	0.012	0.024	0.039	0.024	0.39
SZ H1	J127R0	6/8/2006	0.117	0.023	0.030	0.060	0.085	0.085	0.11
SZ H2	J127R1***	6/8/2006	-0.426	0.037	0.021	0.055	0.070	0.080	0.33

*Sample J13HF3 replaced hexavalent chromium data for sample J127K8.

**Sample J13HF4 replaced carbon-14 data for sample J127P6.

***Sample J13HF5 replaced carbon-14 data for sample J127R1.

SZ = shallow zone

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron
Project 100-B/C Remaining Pipes and Sewers Field Remediation
Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

Date 01/12/07
Job No. 14655
Calc. No. 0100B-CA-V0287
Checked S. W. Clark

Rev. No. 1
Date 1/15/07
Sheet No. 6 of 16

1 100-B-14:1 Remediation Footprint Shallow Zone Statistical Computations

		Carbon-14			Cesium-137			Cobalt-60			Europium-152			Europium-154			Europium-155			Hexavalent Chromium		
95% UCL value based on		Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			95% UCL calculation not performed due to data censorship.		
N		32			32			32			32			32			32			32		
% < Detection limit		100%			97%			100%			100%			100%			100%			53%		
Mean		-0.07			0.018			0.018			0.039			0.06			0.05			0.22		
Standard deviation		0.77			0.012			0.012			0.018			0.04			0.02			0.17		
Z-statistic		1.645			1.645			1.645			1.645			1.645			1.645			1.645		
95% UCL on mean		0.16	U		0.022			0.021	U		0.044	U		0.07	U		0.06	U		NA		
Maximum value		1.83	U		0.10	U		0.14	U		0.15	U		0.46	U		0.21	U		0.91		
Statistical value		0.16	U		0.022			0.021	U		0.044	U		0.07	U		0.06	U		0.91		
Most Stringent Cleanup Limit for nonradionuclide and RAG type																				2 River Protection		
WAC 173-340 3-PART TEST																				NO		
95% UCL > Cleanup Limit?																				NO		
> 10% above Cleanup Limit?																				NO		
Any sample > 2X Cleanup Limit?																				NO		
RISK EVALUATION																				240		
WAC 173-340 Non-Carcinogenic Cleanup:																				3.8E-03		
Hazard quotient for each nonradionuclide:																				2.1		
WAC 173-340 Carcinogenic Cleanup:																				4.3E-07		
Risk for each carcinogenic nonradionuclide:																				The data set meets the 3-part test criteria when compared to the most stringent cleanup limit.		
WAC 173-340 Compliance? YES																						
Hazard quotient sum:																						
Carcinogenic risk sum:																						

25 NA = not applicable
26 U = undetected
27 UCL = upper confidence limit
28 WAC = Washington Administrative Code

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron
Project 100-B/C Remaining Pipes and Sewers Field Remediation
Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

Date 01/12/07
Job No. 14655

Calc. No. 0100B-CA-V0287
Checked S. W. Clark

Rev. No. 1
Date 1/15/07
Sheet No. 7 of 16

1 100-B-14:1 Remediation Footprint Deep Zone Verification Data

Sample Area	Sample Number	Sample Date	Carbon-14			Cesium-137			Cobalt-60			Europium-152			Europium-154			Europium-155			Tritium			Hexavalent Chromium		
			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
DZ A3	J12783	5/30/2006	-0.650	U	2.1	0.020	U	0.020	0.018	U	0.018	0.040	U	0.040	0.064	U	0.064	0.045	U	0.045	-1.38	U	2.4	0.21	U	0.21
Duplicate of J12783	J12791	5/30/2006	0.079	U	2.2	0.025	U	0.025	0.026	U	0.026	0.060	U	0.060	0.079	U	0.079	0.084	U	0.084	-0.696	U	2.5	0.21	U	0.21
DZ A1	J12785	5/30/2006	0.483	U	2.2	0.047		0.016	0.013	U	0.013	0.027	U	0.027	0.043	U	0.043	0.051	U	0.051	-1.08	U	2.4	0.21	U	0.21
DZ A2	J12784	5/30/2006	1.10	U	2.1	0.012	U	0.012	0.012	U	0.012	0.029	U	0.029	0.043	U	0.043	0.041	U	0.041	-0.946	U	2.4	0.21	U	0.21
DZ B4	J12782	5/30/2006	-0.061	U	2.3	0.016	U	0.016	0.017	U	0.017	0.043	U	0.043	0.054	U	0.054	0.073	U	0.073	-1.54	U	2.5	0.21	U	0.21
DZ B5	J12786	5/30/2006	-0.339	U	1.9	0.011	U	0.011	0.023	U	0.023	0.029	U	0.029	0.037	U	0.037	0.038	U	0.038	-0.589	U	2.1	0.21	U	0.21
DZ B6	J12787	5/30/2006	0.445	U	2.0	0.051	U	0.051	0.050	U	0.050	0.13	U	0.13	0.16	U	0.16	0.16	U	0.16	-0.992	U	2.2	0.21	U	0.21
DZ C7	J12788	5/30/2006	0.601	U	2.0	0.206		0.036	0.029	U	0.029	0.072	U	0.072	0.082	U	0.082	0.094	U	0.094	-0.446	U	2.2	0.21	U	0.21
DZ C8	J12789	5/30/2006	-0.399	U	2.0	0.230		0.050	0.049	U	0.049	0.10	U	0.10	0.16	U	0.16	0.11	U	0.11	-1.43	U	2.2	0.21	U	0.21
DZ C9	J12790	5/30/2006	0.369	U	2.0	0.041	U	0.041	0.040	U	0.040	0.089	U	0.089	0.13	U	0.13	0.12	U	0.12	-1.10	U	2.2	0.21	U	0.21

14 Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Carbon-14 pCi/g	Cesium-137 pCi/g	Cobalt-60 pCi/g	Europium-152 pCi/g	Europium-154 pCi/g	Europium-155 pCi/g	Tritium pCi/g	Hexavalent Chromium mg/kg
DZ A3	J12783/J12791	5/30/2006	-0.286	0.011	0.011	0.025	0.036	0.032	-1.04	0.11
DZ A1	J12785	5/30/2006	0.483	0.047	0.0065	0.014	0.022	0.026	-1.08	0.11
DZ A2	J12784	5/30/2006	1.10	0.0060	0.0060	0.015	0.022	0.021	-0.946	0.11
DZ B4	J12782	5/30/2006	-0.061	0.0080	0.0085	0.022	0.027	0.037	-1.54	0.11
DZ B5	J12786	5/30/2006	-0.339	0.0055	0.012	0.015	0.019	0.019	-0.589	0.11
DZ B6	J12787	5/30/2006	0.445	0.026	0.025	0.065	0.080	0.080	-0.992	0.11
DZ C7	J12788	5/30/2006	0.601	0.206	0.015	0.036	0.041	0.047	-0.446	0.11
DZ C8	J12789	5/30/2006	-0.399	0.230	0.025	0.050	0.080	0.055	-1.43	0.11
DZ C9	J12790	5/30/2006	0.369	0.021	0.020	0.045	0.065	0.060	-1.10	0.11

26 Statistical Computations

	Carbon-14			Cesium-137			Cobalt-60			Europium-152			Europium-154			Europium-155			Tritium			Hexavalent Chromium				
	Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			95% UCL calculation not performed due to data censorship.				
95% UCL value based on	N	9		9			9			9			9			9			9			9				
% < Detection limit	100%			67%			100%			100%			100%			100%			100%			100%				
Mean	0.21			0.062			0.014			0.032			0.043			0.042			-1.02			0.11				
Standard deviation	0.51			0.089			0.007			0.018			0.025			0.020			0.35			0				
Z-statistic	1.645			1.645			1.645			1.645			1.645			1.645			1.645			1.645				
95% UCL on mean	0.49	U		0.111			0.018	U		0.042	U		0.057	U		0.053	U		-0.83	U		NA				
Maximum value	1.10	U		0.230			0.050	U		0.13	U		0.16	U		0.16	U		-0.446	U		0.21	U			
Statistical value	0.49	U		0.111			0.018	U		0.042	U		0.057	U		0.053	U		-0.83	U		0.21	U			
Most Stringent Cleanup Limit for nonradionuclide and RAG type																								2 River Protection		
WAC 173-340 3-PART TEST																								NA		
95% UCL > Cleanup Limit?																								NA		
> 10% above Cleanup Limit?																								NA		
Any sample > 2X Cleanup Limit?																								NA		
WAC 173-340 Compliance?			YES																					Because hexavalent chromium was not detected in any sample, the WAC 173-340 3-part test is not required.		

43 DZ = deep zone
44 MDA = minimum detectable activity
45 NA = not applicable
PQL = practical quantitation limit
Q = qualifier
RAG = remedial action goal
U = undetected
UCL = upper confidence limit
WAC = Washington Administrative Code

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron
Project 100-B/C Remaining Pipes and Sewers Field Remediation
Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

Date 11/07/06
Job No. 14655

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Rev. No. 0
Date 11/8/06
Sheet No. 8 of 16

1 100-B-14:1 Overburden Verification Data

Sample Area	Sample Number	Sample Date	Cesium-137			Cobalt-60			Europium-152			Europium-154			Europium-155			Hexavalent Chromium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL
OB A1	J127W4	6/19/2006	0.042	U	0.042	0.042	U	0.042	0.092	U	0.092	0.15	U	0.15	0.13	U	0.13	0.34		0.20
OB A2	J127W3	6/19/2006	0.029	U	0.029	0.035	U	0.035	0.084	U	0.084	0.12	U	0.12	0.12	U	0.12	0.27		0.20
OB A3	J127W1	6/19/2006	0.048	U	0.048	0.051	U	0.051	0.13	U	0.13	0.15	U	0.15	0.19	U	0.19	0.20	U	0.20
OB A4	J127W2	6/19/2006	0.10	U	0.10	0.098	U	0.098	0.22	U	0.22	0.32	U	0.32	0.26	U	0.26	0.20	U	0.20
OB B5	J127W0	6/14/2006	0.035	U	0.035	0.037	U	0.037	0.082	U	0.082	0.12	U	0.12	0.11	U	0.11	0.35		0.21
OB B6	J127V9	6/14/2006	0.13	U	0.13	0.17	U	0.17	0.17	U	0.17	0.54	U	0.54	0.12	U	0.12	0.26		0.21
OB B7	J127V8	6/14/2006	0.047	U	0.047	0.053	U	0.053	0.12	U	0.12	0.17	U	0.17	0.18	U	0.18	0.36		0.21
OB B8	J127V7	6/14/2006	0.024	U	0.024	0.025	U	0.025	0.055	U	0.055	0.090	U	0.090	0.11	U	0.11	0.25		0.21
OB C9	J127V3	6/14/2006	0.039	U	0.039	0.043	U	0.043	0.080	U	0.080	0.13	U	0.13	0.11	U	0.11	0.26		0.22
OB C10	J127V4	6/14/2006	0.031	U	0.031	0.033	U	0.033	0.077	U	0.077	0.098	U	0.098	0.12	U	0.12	0.40		0.21
OB C1	J127V5	6/14/2006	0.052	U	0.052	0.043	U	0.043	0.12	U	0.12	0.15	U	0.15	0.16	U	0.16	0.21	U	0.21
OB C2	J127V6	6/14/2006	0.080		0.030	0.026	U	0.026	0.063	U	0.063	0.076	U	0.076	0.082	U	0.082	0.21	U	0.21
OB D3	J127V2	6/13/2006	0.011	U	0.011	0.011	U	0.011	0.027	U	0.027	0.037	U	0.037	0.056	U	0.056	0.21	U	0.21
OB D4	J127X7	6/19/2006	0.196		0.053	0.050	U	0.050	0.14	U	0.14	0.16	U	0.16	0.18	U	0.18	2.0	UD	2.0
OB D5	J127T6	6/12/2006	0.020	U	0.020	0.026	U	0.026	0.051	U	0.051	0.082	U	0.082	0.056	U	0.056	0.20	U	0.20
OB D6	J127T5	6/12/2006	0.052	U	0.052	0.050	U	0.050	0.14	U	0.14	0.17	U	0.17	0.19	U	0.19	0.28		0.20
OB E7	J127T8	6/13/2006	0.034	U	0.034	0.032	U	0.032	0.079	U	0.079	0.11	U	0.11	0.11	U	0.11	0.27		0.21
OB E8	J127T9	6/13/2006	0.028	U	0.028	0.026	U	0.026	0.063	U	0.063	0.086	U	0.086	0.084	U	0.084	0.32		0.21
OB E9	J127V0	6/13/2006	0.016	U	0.016	0.017	U	0.017	0.044	U	0.044	0.053	U	0.053	0.076	U	0.076	0.21	U	0.21
OB E10	J127V1	6/13/2006	0.014	U	0.014	0.014	U	0.014	0.033	U	0.033	0.048	U	0.048	0.046	U	0.046	0.24		0.21
OB F1	J127T4	6/12/2006	0.020	U	0.020	0.028	U	0.028	0.061	U	0.061	0.084	U	0.084	0.055	U	0.055	0.21		0.20
OB F2	J127T3	6/12/2006	0.032	U	0.032	0.033	U	0.033	0.071	U	0.071	0.11	U	0.11	0.11	U	0.11	0.29		0.20
OB F3	J127T2	6/12/2006	0.037	U	0.037	0.043	U	0.043	0.10	U	0.10	0.12	U	0.12	0.15	U	0.15	0.26		0.20
OB F4	J127T1	6/12/2006	0.037	U	0.037	0.039	U	0.039	0.11	U	0.11	0.12	U	0.12	0.17	U	0.17	0.25		0.20
OB G5	J127T0	6/12/2006	0.021	U	0.021	0.022	U	0.022	0.052	U	0.052	0.070	U	0.070	0.071	U	0.071	0.20	U	0.20
OB G6	J127R9	6/12/2006	0.021	U	0.021	0.024	U	0.024	0.052	U	0.052	0.071	U	0.071	0.053	U	0.053	0.30		0.20
OB G7	J127R8	6/12/2006	0.026	U	0.026	0.027	U	0.027	0.062	U	0.062	0.094	U	0.094	0.092	U	0.092	0.23		0.20
OB G8	J127R7	6/12/2006	0.024	U	0.024	0.024	U	0.024	0.055	U	0.055	0.082	U	0.082	0.080	U	0.080	0.27		0.20
OB H9	J127R6	6/12/2006	0.042	U	0.042	0.043	U	0.043	0.12	U	0.12	0.14	U	0.14	0.16	U	0.16	0.22		0.20
OB H10	J127R5	6/12/2006	0.040	U	0.040	0.042	U	0.042	0.10	U	0.10	0.13	U	0.13	0.15	U	0.15	0.20	U	0.20
OB H1	J127R4	6/12/2006	0.023	U	0.023	0.024	U	0.024	0.059	U	0.059	0.071	U	0.071	0.12	U	0.12	0.20	U	0.20
OB H2	J127R3	6/12/2006	0.026	U	0.026	0.025	U	0.025	0.054	U	0.054	0.088	U	0.088	0.053	U	0.053	0.24		0.20
OB I3	J127P1	6/8/2006	0.023	U	0.023	0.023	U	0.023	0.056	U	0.056	0.073	U	0.073	0.079	U	0.079	0.20	U	0.20
OB I4	J127P2	6/8/2006	0.025	U	0.025	0.027	U	0.027	0.054	U	0.054	0.082	U	0.082	0.053	U	0.053	0.21	U	0.21
OB I5	J127P3	6/8/2006	0.030	U	0.030	0.021	U	0.021	0.053	U	0.053	0.074	U	0.074	0.077	U	0.077	0.31		0.21
OB I6	J127R2	6/12/2006	0.033	U	0.033	0.038	U	0.038	0.079	U	0.079	0.12	U	0.12	0.11	U	0.11	0.28		0.20
OB J7	J127P0	6/8/2006	0.024	U	0.024	0.026	U	0.026	0.049	U	0.049	0.084	U	0.084	0.087	U	0.087	0.29		0.20
OB J8	J127N9	6/8/2006	0.036	U	0.036	0.040	U	0.040	0.11	U	0.11	0.13	U	0.13	0.15	U	0.15	0.26		0.20
OB J9	J127N8	6/7/2006	0.023	U	0.023	0.033	U	0.033	0.056	U	0.056	0.071	U	0.071	0.079	U	0.079	0.27		0.20
OB J10	J127N7	6/7/2006	0.023	U	0.023	0.023	U	0.023	0.052	U	0.052	0.086	U	0.086	0.048	U	0.048	0.35		0.20
OB K1	J127N4	6/7/2006	0.043	U	0.043	0.042	U	0.042	0.11	U	0.11	0.14	U	0.14	0.16	U	0.16	0.75		0.20
OB K2	J127N5	6/7/2006	0.043	U	0.043	0.042	U	0.042	0.11	U	0.11	0.14	U	0.14	0.15	U	0.15	0.61		0.20
OB K3	J127N6	6/7/2006	0.030	U	0.030	0.035	U	0.035	0.076	U	0.076	0.11	U	0.11	0.11	U	0.11	0.60		0.20
OB K4	J127T7	6/12/2006	0.024	U	0.024	0.030	U	0.030	0.062	U	0.062	0.090	U	0.090	0.062	U	0.062	0.24		0.20
OB L5	J127N2	6/7/2006	0.069		0.032	0.031	U	0.031	0.071	U	0.071	0.10	U	0.10	0.068	U	0.068	0.75		0.21
Duplicate of J127N2	J127N3	6/7/2006	0.033		0.024	0.023	U	0.023	0.061	U	0.061	0.080	U	0.080	0.084	U	0.084	0.72		0.21
OB L6	J127M8	6/7/2006	0.030	U	0.030	0.028	U	0.028	0.072	U	0.072	0.11	U	0.11	0.060	U	0.060	0.23		0.21
Duplicate of J127M8	J127M9	6/7/2006	0.025	U	0.025	0.026	U	0.026	0.062	U	0.062	0.081	U	0.081	0.087	U	0.087	0.36		0.21

52 MDA = minimum detectable activity

PQL = practical quantitation limit

U = undetected

53 OB = overburden

Q = qualifier

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron *JMC*
Project 100-B/C Remaining Pipes and Sewers Field Remediation
Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

Date 11/07/06 Calc. No. 0100B-CA-V0287
Job No. 14655 Checked W. S. Thompson

Rev. No. 0
Date 11/8/06
Sheet No. 9 of 16

1 100-B-14:1 Overburden Verification Data (continued)

Sample Area	Sample Number	Sample Date	Cesium-137			Cobalt-60			Europium-152			Europium-154			Europium-155			Hexavalent Chromium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL
OB L7	J127N0	6/7/2006	0.173		0.053	0.049	U	0.049	0.13	U	0.13	0.16	U	0.16	0.17	U	0.17	0.75		0.41
OB L8	J127N1	6/7/2006	0.032	U	0.032	0.043	U	0.043	0.081	U	0.081	0.14	U	0.14	0.12	U	0.12	0.28		0.20
OB M9	J127M7	6/7/2006	0.032	U	0.032	0.042	U	0.042	0.079	U	0.079	0.14	U	0.14	0.18	U	0.18	0.21	U	0.21
OB M10	J127M5	6/7/2006	0.027	U	0.027	0.026	U	0.026	0.070	U	0.070	0.086	U	0.086	0.093	U	0.093	0.22		0.21
Duplicate of J127M5	J127M6	6/7/2006	0.044	U	0.044	0.045	U	0.045	0.13	U	0.13	0.15	U	0.15	0.17	U	0.17	0.29		0.21
OB M1	J127M4	6/7/2006	0.025	U	0.025	0.026	U	0.026	0.063	U	0.063	0.10	U	0.10	0.061		0.058	0.28		0.21
OB M2	J127H7	6/5/2006	0.045	U	0.045	0.046	U	0.046	0.11	U	0.11	0.15	U	0.15	0.17	U	0.17	0.21	U	0.21
OB N3	J127K7	6/5/2006	0.168		0.029	0.025	U	0.025	0.064	U	0.064	0.079	U	0.079	0.10	U	0.10	0.27		0.21
OB N4	J127K6	6/5/2006	0.042	U	0.042	0.041	U	0.041	0.11	U	0.11	0.15	U	0.15	0.16	U	0.16	0.39		0.21
OB N5	J127K5	6/5/2006	0.034	U	0.034	0.038	U	0.038	0.082	U	0.082	0.12	U	0.12	0.12	U	0.12	0.32		0.21
OB N6	J127K4	6/5/2006	0.033	U	0.033	0.034	U	0.034	0.090	U	0.090	0.11	U	0.11	0.12	U	0.12	0.21	U	0.21
OB O7	J127K0	6/5/2006	0.030	U	0.030	0.033	U	0.033	0.073	U	0.073	0.12	U	0.12	0.10	U	0.10	0.32		0.21
OB O8	J127K1	6/5/2006	0.025	U	0.025	0.025	U	0.025	0.061	U	0.061	0.097	U	0.097	0.051	U	0.051	0.22	U	0.22
OB O9	J127K2	6/5/2006	0.033	U	0.033	0.041	U	0.041	0.077	U	0.077	0.13	U	0.13	0.11	U	0.11	0.21	U	0.21
OB O10	J127K3	6/5/2006	0.022	U	0.022	0.023	U	0.023	0.055	U	0.055	0.073	U	0.073	0.077	U	0.077	0.28		0.21
OB P1	J127H5	5/31/2006	0.026	U	0.026	0.021	U	0.021	0.053	U	0.053	0.089	U	0.089	0.053	U	0.053	0.31		0.20
OB P2	J127J5	6/1/2006	0.041	U	0.041	0.044	U	0.044	0.11	U	0.11	0.14	U	0.14	0.14	U	0.14	0.20	U	0.20
Duplicate of J127J5	J127J6	6/1/2006	0.033	U	0.033	0.031	U	0.031	0.069	U	0.069	0.11	U	0.11	0.11	U	0.11	0.21	U	0.21
OB P3	J127J7	6/1/2006	0.025	U	0.025	0.022	U	0.022	0.049	U	0.049	0.085	U	0.085	0.047	U	0.047	0.22		0.20
Duplicate of J127J7	J127J8	6/1/2006	0.022	U	0.022	0.023	U	0.023	0.056	U	0.056	0.074	U	0.074	0.079	U	0.079	0.24		0.20
OB P4	J127J9	6/5/2006	0.045	U	0.045	0.046	U	0.046	0.12	U	0.12	0.14	U	0.14	0.16	U	0.16	0.22	U	0.22
OB Q5	J127H4	5/31/2006	0.014	U	0.014	0.014	U	0.014	0.036	U	0.036	0.046	U	0.046	0.072	U	0.072	0.33		0.20
OB Q6	J127H1	5/30/2006	0.024	U	0.024	0.022	U	0.022	0.050	U	0.050	0.079	U	0.079	0.048	U	0.048	0.20	U	0.20
OB Q7	J127F2	5/30/2006	0.025	U	0.025	0.027	U	0.027	0.058	U	0.058	0.093	U	0.093	0.058	U	0.058	0.20	U	0.20
OB Q8	J127F3	5/30/2006	0.031	U	0.031	0.030	U	0.030	0.071	U	0.071	0.11	U	0.11	0.083	U	0.083	0.21	U	0.21
OB R9	J127F6	5/30/2006	0.030	U	0.030	0.018	U	0.018	0.042	U	0.042	0.054	U	0.054	0.058	U	0.058	0.20	U	0.20
OB R10	J127F7	5/30/2006	0.048	U	0.048	0.052	U	0.052	0.13	U	0.13	0.17	U	0.17	0.17	U	0.17	0.20	U	0.20
OB R1	J127F4	5/30/06	0.028	U	0.028	0.030	U	0.030	0.067	U	0.067	0.097	U	0.097	0.094	U	0.094	0.20	U	0.20
OB R2	J127F5	5/30/06	0.024	U	0.024	0.024	U	0.024	0.052	U	0.052	0.086	U	0.086	0.049	U	0.049	0.20	U	0.20
OB S3	J127F8	5/30/06	0.039	U	0.039	0.042	U	0.042	0.11	U	0.11	0.14	U	0.14	0.14	U	0.14	0.20	U	0.20
OB S4	J127F9	5/30/06	0.021	U	0.021	0.022	U	0.022	0.052	U	0.052	0.067	U	0.067	0.070	U	0.070	0.20	U	0.20
OB S5	J127H0	5/30/06	0.075	U	0.075	0.14	U	0.14	0.12	U	0.12	0.45	U	0.45	0.091	U	0.091	0.20	U	0.20
OB S6	J127X6	6/19/06	0.079	U	0.079	0.080	U	0.080	0.19	U	0.19	0.28	U	0.28	0.21	U	0.21	0.34		0.20
OB T7	J127X8	6/19/06	0.022	U	0.022	0.030	U	0.030	0.063	U	0.063	0.097	U	0.097	0.060	U	0.060	0.23		0.20
OB T8	J127X5	6/19/06	0.022	U	0.022	0.025	U	0.025	0.060	U	0.060	0.088	U	0.088	0.059	U	0.059	0.28		0.20
OB T9	J127X4	6/19/06	0.083	U	0.083	0.083	U	0.083	0.20	U	0.20	0.30	U	0.30	0.22	U	0.22	0.24		0.20
OB T10	J127X3	6/19/06	0.10	U	0.10	0.11	U	0.11	0.16	U	0.16	0.39	U	0.39	0.099	U	0.099	0.20	U	0.20
OB U1	J127X2	6/19/06	0.048		0.027	0.024	U	0.024	0.065	U	0.065	0.083	U	0.083	0.090	U	0.090	0.20	U	0.20
OB U2	J127X1	6/19/06	0.059	U	0.059	0.032	U	0.032	0.074	U	0.074	0.11	U	0.11	0.083	U	0.083	0.24		0.20
OB U3	J127X0	6/19/06	0.040	U	0.040	0.012	U	0.012	0.027	U	0.027	0.039	U	0.039	0.049	U	0.049	0.27		0.20
OB U4	J127W9	6/19/06	0.033	U	0.033	0.036	U	0.036	0.079	U	0.079	0.12	U	0.12	0.077	U	0.081	0.22		0.20
OB V5	J127W8	6/19/06	0.028	U	0.028	0.036	U	0.036	0.076	U	0.076	0.10	U	0.10	0.11	U	0.11	0.20	U	0.20
OB V6	J127W7	6/19/06	0.094	U	0.094	0.099	U	0.099	0.23	U	0.23	0.34	U	0.34	0.26	U	0.26	0.20	U	0.20
OB V7	J127W6	6/19/06	0.030	U	0.030	0.032	U	0.032	0.074	U	0.074	0.10	U	0.10	0.10	U	0.10	0.20	U	0.20
OB V8	J127W5	6/19/06	0.050	U	0.050	0.054	U	0.054	0.13	U	0.13	0.16	U	0.16	0.19	U	0.19	0.20	U	0.20

49 MDA = minimum detectable activity

PQL = practical quantitation limit

U = undetected

50 OB = overburden

Q = qualifier

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron
Project 100-B/C Remaining Pipes and Sewers Field Remediation
Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

Date 11/07/06
Job No. 14655
Calc. No. 0100B-CA-V0287
Checked W. S. Thompson

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Date 11/8/06
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1 100-B-14:1 Overburden Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Cesium-137 pCi/g	Cobalt-60 pCi/g	Europium-152 pCi/g	Europium-154 pCi/g	Europium-155 pCi/g	Hexavalent Chromium mg/kg
OB A1	J127W4	6/19/2006	0.021	0.021	0.046	0.075	0.065	0.34
OB A2	J127W3	6/19/2006	0.015	0.018	0.042	0.060	0.060	0.27
OB A3	J127W1	6/19/2006	0.024	0.026	0.065	0.075	0.095	0.10
OB A4	J127W2	6/19/2006	0.050	0.049	0.11	0.16	0.13	0.10
OB B5	J127W0	6/14/2006	0.018	0.019	0.041	0.060	0.055	0.35
OB B6	J127V9	6/14/2006	0.065	0.085	0.085	0.27	0.060	0.26
OB B7	J127V8	6/14/2006	0.024	0.027	0.060	0.085	0.090	0.36
OB B8	J127V7	6/14/2006	0.012	0.013	0.028	0.045	0.055	0.25
OB C9	J127V3	6/14/2006	0.020	0.022	0.040	0.065	0.055	0.26
OB C10	J127V4	6/14/2006	0.016	0.017	0.039	0.049	0.060	0.40
OB C1	J127V5	6/14/2006	0.026	0.022	0.060	0.075	0.080	0.11
OB C2	J127V6	6/14/2006	0.080	0.013	0.032	0.038	0.041	0.11
OB D3	J127V2	6/13/2006	0.0055	0.0055	0.014	0.019	0.028	0.11
OB D4	J127X7	6/19/2006	0.196	0.025	0.070	0.080	0.090	1.0
OB D5	J127T6	6/12/2006	0.010	0.013	0.026	0.041	0.028	0.10
OB D6	J127T5	6/12/2006	0.026	0.025	0.070	0.085	0.095	0.28
OB E7	J127T8	6/13/2006	0.017	0.016	0.040	0.055	0.055	0.27
OB E8	J127T9	6/13/2006	0.014	0.013	0.032	0.043	0.042	0.32
OB E9	J127V0	6/13/2006	0.0080	0.0085	0.022	0.027	0.038	0.11
OB E10	J127V1	6/13/2006	0.0070	0.0070	0.017	0.024	0.023	0.24
OB F1	J127T4	6/12/2006	0.010	0.014	0.031	0.042	0.028	0.21
OB F2	J127T3	6/12/2006	0.016	0.017	0.036	0.055	0.055	0.29
OB F3	J127T2	6/12/2006	0.019	0.022	0.050	0.060	0.075	0.26
OB F4	J127T1	6/12/2006	0.019	0.020	0.055	0.060	0.085	0.25
OB G5	J127T0	6/12/2006	0.011	0.011	0.026	0.035	0.036	0.10
OB G6	J127R9	6/12/2006	0.011	0.012	0.026	0.036	0.027	0.30
OB G7	J127R8	6/12/2006	0.013	0.014	0.031	0.047	0.046	0.23
OB G8	J127R7	6/12/2006	0.012	0.012	0.028	0.041	0.040	0.27
OB H9	J127R6	6/12/2006	0.021	0.022	0.060	0.070	0.080	0.22
OB H10	J127R5	6/12/2006	0.020	0.021	0.050	0.065	0.075	0.10
OB H1	J127R4	6/12/2006	0.012	0.012	0.030	0.036	0.060	0.10
OB H2	J127R3	6/12/2006	0.013	0.013	0.027	0.044	0.027	0.24
OB I3	J127P1	6/8/2006	0.012	0.012	0.028	0.037	0.040	0.10
OB I4	J127P2	6/8/2006	0.013	0.014	0.027	0.041	0.027	0.11
OB I5	J127P3	6/8/2006	0.015	0.011	0.027	0.037	0.039	0.31
OB I6	J127R2	6/12/2006	0.017	0.019	0.040	0.060	0.055	0.28
OB J7	J127P0	6/8/2006	0.012	0.013	0.025	0.042	0.044	0.29
OB J8	J127N9	6/8/2006	0.018	0.020	0.055	0.065	0.075	0.26
OB J9	J127N8	6/7/2006	0.012	0.017	0.028	0.036	0.040	0.27
OB J10	J127N7	6/7/2006	0.012	0.012	0.026	0.043	0.024	0.35
OB K1	J127N4	6/7/2006	0.022	0.021	0.055	0.070	0.080	0.75
OB K2	J127N5	6/7/2006	0.022	0.021	0.055	0.070	0.075	0.61
OB K3	J127N6	6/7/2006	0.015	0.018	0.038	0.055	0.055	0.60
OB K4	J127T7	6/12/2006	0.012	0.015	0.031	0.045	0.031	0.24
OB L5	J127N2/J127N3	6/7/2006	0.051	0.014	0.033	0.045	0.038	0.74
OB L6	J127M8/J127M9	6/7/2006	0.014	0.014	0.034	0.048	0.037	0.30

50 OB = overburden

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron
Project 100-B/C Remaining Pipes and Sewers Field Remediation
Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

Date 11/07/06
Job No. 14655
Calc. No. 0100B-CA-V0287
Checked W. S. Thompson

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Date 11/8/06
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1 100-B-14:1 Overburden Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Cesium-137 pCi/g	Cobalt-60 pCi/g	Europium-152 pCi/g	Europium-154 pCi/g	Europium-155 pCi/g	Hexavalent Chromium mg/kg
OB L7	J127N0	6/7/2006	0.173	0.025	0.065	0.080	0.085	0.75
OB L8	J127N1	6/7/2006	0.016	0.022	0.041	0.070	0.060	0.28
OB M9	J127M7	6/7/2006	0.016	0.021	0.040	0.070	0.090	0.11
OB M10	J127M5/J127M6	6/7/2006	0.018	0.018	0.050	0.059	0.066	0.26
OB M1	J127M4	6/7/2006	0.013	0.013	0.032	0.050	0.061	0.28
OB M2	J127H7	6/5/2006	0.023	0.023	0.055	0.075	0.085	0.11
OB N3	J127K7	6/5/2006	0.168	0.013	0.032	0.040	0.050	0.27
OB N4	J127K6	6/5/2006	0.021	0.021	0.055	0.075	0.080	0.39
OB N5	J127K5	6/5/2006	0.017	0.019	0.041	0.060	0.060	0.32
OB N6	J127K4	6/5/2006	0.017	0.017	0.045	0.055	0.060	0.11
OB O7	J127K0	6/5/2006	0.015	0.017	0.037	0.060	0.050	0.32
OB O8	J127K1	6/5/2006	0.013	0.013	0.031	0.049	0.026	0.11
OB O9	J127K2	6/5/2006	0.017	0.021	0.039	0.065	0.055	0.11
OB O10	J127K3	6/5/2006	0.011	0.012	0.028	0.037	0.039	0.28
OB P1	J127H5	5/31/2006	0.013	0.011	0.027	0.045	0.027	0.31
OB P2	J127J5/J127J6	6/1/2006	0.019	0.019	0.045	0.063	0.063	0.10
OB P3	J127J7/J127J8	6/1/2006	0.012	0.011	0.026	0.040	0.032	0.23
OB P4	J127J9	6/5/2006	0.023	0.023	0.060	0.070	0.080	0.11
OB Q5	J127H4	5/31/2006	0.0070	0.0070	0.018	0.023	0.036	0.33
OB Q6	J127H1	5/30/2006	0.012	0.011	0.025	0.040	0.024	0.10
OB Q7	J127F2	5/30/2006	0.013	0.014	0.029	0.047	0.029	0.10
OB Q8	J127F3	5/30/2006	0.016	0.015	0.036	0.055	0.042	0.11
OB R9	J127F6	5/30/2006	0.015	0.0090	0.021	0.027	0.029	0.10
OB R10	J127F7	5/30/2006	0.024	0.026	0.065	0.085	0.085	0.10
OB R1	J127F4	5/30/2006	0.014	0.015	0.034	0.049	0.047	0.10
OB R2	J127F5	5/30/2006	0.012	0.012	0.026	0.043	0.025	0.10
OB S3	J127F8	5/30/2006	0.020	0.021	0.055	0.070	0.070	0.10
OB S4	J127F9	5/30/2006	0.011	0.011	0.026	0.034	0.035	0.10
OB S5	J127H0	5/30/2006	0.038	0.070	0.060	0.23	0.046	0.10
OB S6	J127X6	6/19/2006	0.040	0.040	0.095	0.14	0.11	0.34
OB T7	J127X8	6/19/2006	0.011	0.015	0.032	0.049	0.030	0.23
OB T8	J127X5	6/19/2006	0.011	0.013	0.030	0.044	0.030	0.28
OB T9	J127X4	6/19/2006	0.042	0.042	0.10	0.15	0.11	0.24
OB T10	J127X3	6/19/2006	0.050	0.055	0.080	0.20	0.050	0.10
OB U1	J127X2	6/19/2006	0.048	0.012	0.033	0.042	0.045	0.10
OB U2	J127X1	6/19/2006	0.030	0.016	0.037	0.055	0.042	0.24
OB U3	J127X0	6/19/2006	0.020	0.006	0.014	0.020	0.025	0.27
OB U4	J127W9	6/19/2006	0.017	0.018	0.040	0.060	0.077	0.22
OB V5	J127W8	6/19/2006	0.014	0.018	0.038	0.050	0.055	0.10
OB V6	J127W7	6/19/2006	0.047	0.050	0.12	0.17	0.13	0.10
OB V7	J127W6	6/19/2006	0.015	0.016	0.037	0.050	0.050	0.10
OB V8	J127W5	6/19/2006	0.025	0.027	0.065	0.080	0.095	0.10

46 OB = overburden

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron
Project 100-B/C Remaining Pipes and Sewers Field Remediation
Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

Date 11/07/06
Job No. 14655
Calc. No. 0100B-CA-V0287
Checked W. S. Thompson

Rev. No. 0
Date 11/8/06
Sheet No. 12 of 16

1 100-B-14:1 Overburden Statistical Computations

2		Cesium-137			Cobalt-60			Europium-152			Europium-154			Europium-155			Hexavalent Chromium		
	95% UCL value based on	Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Large data set (n ≥ 10), lognormal and normal distribution rejected, use z-statistic.		
3																			
4	N	88			88			88			88			88			88		
5	% < Detection limit	93%			100%			100%			100%			99%			41%		
6	Mean	0.025			0.019			0.04			0.06			0.06			0.24		
7	Standard deviation	0.032			0.013			0.02			0.04			0.02			0.17		
8	Z-statistic	1.645			1.645			1.645			1.645			1.645			1.645		
9	95% UCL on mean	0.031			0.021	U		0.05	U		0.07	U		0.06			0.27		
0	Maximum value	0.196			0.17	U		0.23	U		0.54	U		0.26			1.00		
	Background	1.1			0.008			NA			0.033			0.054			NA		
1	Statistical value	0(<BG)			0.013	U		0.05	U		0.04	U		0.006			0.27		
2	Most Stringent Cleanup Limit for nonradionuclide and RAG type																2 River Protection		
3	WAC 173-340 3-PART TEST																NO		
4	95% UCL > Cleanup Limit?																NO		
5	> 10% above Cleanup Limit?																NO		
6	Any sample > 2X Cleanup Limit?																		
7	RISK EVALUATION																240		
8	WAC 173-340 Non-Carcinogenic Cleanup:																1.1E-03		
9	Hazard quotient for each nonradionuclide:																2.1		
10	WAC 173-340 Carcinogenic Cleanup:																1.3E-07		
11	Risk for each carcinogenic nonradionuclide:																The data set meets the 3-part test criteria when compared to the most stringent cleanup limit.		
22	WAC 173-340 Compliance? YES																		
23	Hazard quotient sum:	1.1E-03																	
24	Carcinogenic risk sum:	1.3E-07																	

25 NA = not applicable
26 U = undetected
27 UCL = upper confidence limit
28 WAC = Washington Administrative Code

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron
Project 100-B/C Remaining Pipes and Sewers Field Remediation
Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

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Rev. No. 1
Date 1/5/07
Sheet No. 12A of 16

1 100-B-14:1 OB01, OB02, and OB03 Carbon-14 Verification Data

	Sample Area	Sample Number	Sample Date	Carbon-14			Sample Area	Sample Number	Sample Date	Carbon-14			Sample Area	Sample Number	Sample Date	Carbon-14		
				pCi/g	Q	MDA				pCi/g	Q	MDA				pCi/g	Q	MDA
4	OB01 C2	J13FX9	9/21/06	0.597	U	2.3	OB02 A1	J13FR2	9/19/06	-0.878	U	3.0	OB03 A1	J13FT4	9/20/06	-0.944	U	2.9
5	Duplicate of J13FX9	J13FY0	9/21/06	-1.68	U	2.2	OB02 A2	J13FR3	9/19/06	-1.32	U	2.9	OB03 A2	J13FT5	9/20/06	0.969	U	2.7
6	OB01 A2	J13FX1	9/21/06	-1.24	U	2.3	OB02 A3	J13FR4	9/19/06	-0.148	U	2.7	OB03 A3	J13FT6	9/20/06	0.461	U	3.2
7	OB01 A3	J13FX2	9/21/06	-0.864	U	2.0	OB02 A4	J13FR5	9/19/06	-1.02	U	3.1	OB03 A4	J13FT7	9/20/06	-0.076	U	2.8
8	OB01 A4	J13HD4	9/28/06	-1.49	U	2.9	OB02 B5	J13FR6	9/19/06	0.258	U	2.7	OB03 B5	J13FT0	9/20/06	-0.477	U	3.0
9	OB01 B5	J13HD5	9/28/06	2.19	U	2.6	OB02 B6	J13FR7	9/19/06	-0.672	U	2.6	OB03 B6	J13FT1	9/20/06	-1.40	U	2.9
10	OB01 B6	J13FX3	9/21/06	-1.01	U	2.3	OB02 B7	J13FR8	9/19/06	0.199	U	2.9	OB03 B7	J13FT2	9/20/06	-0.281	U	3.1
11	OB01 B7	J13FX4	9/21/06	-1.63	U	2.1	OB02 B8	J13FR9	9/19/06	-0.439	U	2.9	OB03 B8	J13FT3	9/20/06	0.042	U	3.0
12	OB01 B8	J13FX5	9/21/06	-0.767	U	2.2							OB03 C9	J13FT8	9/20/06	-0.137	U	2.8
13	OB01 C9	J13FX6	9/21/06	-1.21	U	2.3							OB03 C10	J13FT9	9/20/06	-0.463	U	2.7
14	OB01 C10	J13FX7	9/21/06	-0.975	U	2.1							OB03 C1	J13FV0	9/20/06	-0.773	U	2.2
15	OB01 C1	J13FX8	9/21/06	-0.962	U	2.1							OB03 C2	J13FV1	9/20/06	0	U	2.4
16													OB03 D3	J13FV2	9/20/06	0.174	U	1.9
17													OB03 D4	J13FV3	9/20/06	0.334	U	2.3
18													OB03 D5	J13FV4	9/20/06	-0.738	U	2.0
19													OB03 D6	J13FV5	9/20/06	0.054	U	2.0
20													OB03 E7	J13FW0	9/20/06	-0.347	U	2.4
21													OB03 E8	J13FW1	9/20/06	-0.676	U	2.1
22													OB03 E9	J13FW2	9/20/06	-0.038	U	2.1
23													OB03 E10	J13FW3	9/20/06	2.32	U	2.4
24													OB03 F1	J13FV6	9/20/06	0.562	U	1.9
25													OB03 F2	J13FV7	9/20/06	-0.781	U	2.1
26													OB03 F3	J13FV8	9/20/06	-0.576	U	2.1
27													OB03 F4	J13FV9	9/20/06	-0.123	U	2.2

28 MDA = minimum detectable activity
29 OB = overburden
30 Q = qualifier

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron
Project 100-B/C Remaining Pipes and Sewers Field Remediation
Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

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Date 1/15/07
Sheet No. 12B of 16

1 100-B-14:1 OB01, OB02, and OB03 Carbon-14 Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Carbon-14 pCi/g	Sample Area	Sample Number	Sample Date	Carbon-14 pCi/g	Sample Area	Sample Number	Sample Date	Carbon-14 pCi/g
OB01 C2	J13FX9/J13FY0	9/21/2006	-0.542	OB02 A1	J13FR2	9/19/2006	-0.878	OB03 A1	J13FT4	9/20/2006	-0.944
OB01 A2	J13FX1	9/21/2006	-1.24	OB02 A2	J13FR3	9/19/2006	-1.32	OB03 A2	J13FT5	9/20/2006	0.969
OB01 A3	J13FX2	9/21/2006	-0.864	OB02 A3	J13FR4	9/19/2006	-0.148	OB03 A3	J13FT6	9/20/2006	0.461
OB01 A4	J13HD4	9/28/2006	-1.49	OB02 A4	J13FR5	9/19/2006	-1.02	OB03 A4	J13FT7	9/20/2006	-0.076
OB01 B5	J13HD5	9/28/2006	2.19	OB02 B5	J13FR6	9/19/2006	0.258	OB03 B5	J13FT0	9/20/2006	-0.477
OB01 B6	J13FX3	9/21/2006	-1.01	OB02 B6	J13FR7	9/19/2006	-0.672	OB03 B6	J13FT1	9/20/2006	-1.40
OB01 B7	J13FX4	9/21/2006	-1.63	OB02 B7	J13FR8	9/19/2006	0.199	OB03 B7	J13FT2	9/20/2006	-0.281
OB01 B8	J13FX5	9/21/2006	-0.767	OB02 B8	J13FR9	9/19/2006	-0.439	OB03 B8	J13FT3	9/20/2006	0.042
OB01 C9	J13FX6	9/21/2006	-1.21					OB03 C9	J13FT8	9/20/2006	-0.137
OB01 C10	J13FX7	9/21/2006	-0.975					OB03 C10	J13FT9	9/20/2006	-0.463
OB01 C1	J13FX8	9/21/2006	-0.962					OB03 C1	J13FV0	9/20/2006	-0.773
								OB03 C2	J13FV1	9/20/2006	0
								OB03 D3	J13FV2	9/20/2006	0.174
								OB03 D4	J13FV3	9/20/2006	0.334
								OB03 D5	J13FV4	9/20/2006	-0.738
								OB03 D6	J13FV5	9/20/2006	0.054
								OB03 E7	J13FW0	9/20/2006	-0.347
								OB03 E8	J13FW1	9/20/2006	-0.676
								OB03 E9	J13FW2	9/20/2006	-0.038
								OB03 E10	J13FW3	9/20/2006	2.32
								OB03 F1	J13FV6	9/20/2006	0.562
								OB03 F2	J13FV7	9/20/2006	-0.781
								OB03 F3	J13FV8	9/20/2006	-0.576
								OB03 F4	J13FV9	9/20/2006	-0.123

28 100-B-14:1 OB01, OB02, and OB03 Carbon-14 Statistical Computation Input Data

Carbon-14			Carbon-14			Carbon-14		
95% UCL value based on			95% UCL value based on			95% UCL value based on		
Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.			Radionuclide data set. Use nonparametric z-statistic.		
N	11		N	8		N	24	
% < Detection limit	100%		% < Detection limit	100%		% < Detection limit	100%	
Mean	-0.773		Mean	-0.503		Mean	-0.121	
Standard deviation	1.03		Standard deviation	0.574		Standard deviation	0.744	
Z-statistic	1.645		Z-statistic	1.645		Z-statistic	1.645	
95% UCL on mean	-0.261	U	95% UCL on mean	-0.169	U	95% UCL on mean	0.128	U
Maximum value	2.19	U	Maximum value	0.26	U	Maximum value	2.32	U
Statistical value	-0.261	U	Statistical value	-0.169	U	Statistical value	0.128	U

39 OB = overburden
40 U = undetected
41 UCL = upper confidence limit

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron
Project 100-B/C Remaining Pipes and Sewers Field Remediation
Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

Date 01/12/07
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Calc. No. 0100B-CA-V0287
Checked S. W. Clark

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Date 1/15/07
Sheet No. 12C of 16

1 100-B-14:1 OB04, OB05, and OB06 Carbon-14 Verification Data

Sample Area	Sample Number	Sample Date	Carbon-14			Sample Area	Sample Number	Sample Date	Carbon-14			Sample Area	Sample Number	Sample Date	Carbon-14		
			pCi/g	Q	MDA				pCi/g	Q	MDA				pCi/g	Q	MDA
OB04 A1	J13FY1	9/22/06	-1.03	U	2.1	OB05 A1	J13H05	9/25/06	0.396	U	2.2	OB06 A4	J13H03	9/22/06	-0.567	U	2.6
Duplicate of J13FY1	J13FY2	9/22/06	-0.888	U	2.7	Duplicate of J13H05	J13H09	9/25/06	-0.472	U	2.2	Duplicate of J13H03	J13H04	9/22/06	0.132	U	2.7
OB04 A2	J13FY3	9/22/06	-0.036	U	2.5	OB05 A2	J13H06	9/25/06	-0.073	U	2.0	OB06 A1	J13H00	9/22/06	1.00	U	2.8
OB04 A3	J13FY4	9/22/06	-0.577	U	2.7	OB05 A3	J13H07	9/25/06	0.088	U	1.9	OB06 A2	J13H01	9/22/06	0.338	U	2.4
OB04 A4	J13FY5	9/22/06	0.192	U	2.7	OB05 A4	J13H08	9/25/06	-0.823	U	2.0	OB06 A3	J13H02	9/22/06	0.871	U	2.6
OB04 B5	J13FY6	9/22/06	0.219	U	2.8	OB05 B5	J13H10	9/25/06	-0.296	U	2.3	OB06 B5	J13H22	9/25/06	-0.143	U	2.0
OB04 B6	J13FY7	9/22/06	0.689	U	2.6	OB05 B6	J13H29	9/26/06	1.72	U	2.6	OB06 B6	J13H23	9/25/06	-0.282	U	2.2
OB04 B7	J13FY8	9/22/06	1.01	U	2.6	OB05 B7	J13H12	9/25/06	0.200	U	2.0	OB06 B7	J13H24	9/25/06	-0.477	U	2.0
OB04 B8	J13FY9	9/22/06	0.786	U	2.5	OB05 B8	J13H13	9/25/06	-0.112	U	2.0	OB06 B8	J13H25	9/25/06	0.139	U	1.9
OB04 C9	J13H27	9/26/06	-0.708	U	2.6	OB05 C9	J13HD6	9/28/06	-0.078	U	2.8						
OB04 C10	J13H28	9/26/06	0.576	U	2.7	OB05 C10	J13HD7	9/28/06	0.840	U	2.8						
OB04 C1	J13H11	9/26/06	0.187	U	2.9	OB05 C1	J13H14	9/25/06	0.755	U	2.1						
OB04 C2	J13H26	9/26/06	0.900	U	2.8	OB05 C2	J13H15	9/25/06	-1.18	U	2.1						
						OB05 D3	J13H16	9/25/06	0.521	U	2.0						
						OB05 D4	J13H17	9/25/06	1.39	U	2.1						
						OB05 D5	J13H18	9/25/06	0.238	U	2.2						
						OB05 D6	J13H19	9/25/06	0.578	U	1.9						
						OB05 E7	J13HD2	9/26/06	0.483	U	2.8						
						OB05 E8	J13HD3	9/26/06	0.580	U	2.7						
						OB05 E9	J13H20	9/25/06	-0.303	U	2.4						
						OB05 E10	J13H21	9/25/06	-0.367	U	2.0						

25 MDA = minimum detectable activity
26 OB = overburden
27 Q = qualifier

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron *JMC*
Project 100-B/C Remaining Pipes and Sewers Field Remediation
Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

Date 01/12/07
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Checked S. W. Clark *SWC*

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Date 1/5/07
Sheet No. 12D of 16

1 100-B-14:1 OB04, OB05, and OB06 Carbon-14 Statistical Computation Input Data

Sample Area	Sample Number	Sample Date	Carbon-14 pCi/g			Sample Area	Sample Number	Sample Date	Carbon-14 pCi/g			Sample Area	Sample Number	Sample Date	Carbon-14 pCi/g		
OB04 A1	J13FY1/J13FY2	9/22/2006	-0.959			OB05 A1	J13H05/J13H09	9/25/2006	-0.038			OB06 A4	J13H03/J13H04	9/22/2006	-0.218		
OB04 A2	J13FY3	9/22/2006	-0.036			OB05 A2	J13H06	9/25/2006	-0.073			OB06 A1	J13H00	9/22/2006	1.00		
OB04 A3	J13FY4	9/22/2006	-0.577			OB05 A3	J13H07	9/25/2006	0.088			OB06 A2	J13H01	9/22/2006	0.338		
OB04 A4	J13FY5	9/22/2006	0.192			OB05 A4	J13H08	9/25/2006	-0.823			OB06 A3	J13H02	9/22/2006	0.871		
OB04 B5	J13FY6	9/22/2006	0.219			OB05 B5	J13H10	9/25/2006	-0.296			OB06 B5	J13H22	9/25/2006	-0.143		
OB04 B6	J13FY7	9/22/2006	0.689			OB05 B6	J13H29	9/26/2006	1.72			OB06 B6	J13H23	9/25/2006	-0.282		
OB04 B7	J13FY8	9/22/2006	1.01			OB05 B7	J13H12	9/25/2006	0.200			OB06 B7	J13H24	9/25/2006	-0.477		
OB04 B8	J13FY9	9/22/2006	0.786			OB05 B8	J13H13	9/25/2006	-0.112			OB06 B8	J13H25	9/25/2006	0.139		
OB04 C9	J13H27	9/26/2006	-0.708			OB05 C9	J13HD6	9/28/2006	-0.078								
OB04 C10	J13H28	9/26/2006	0.576			OB05 C10	J13HD7	9/28/2006	0.840								
OB04 C1	J13H11	9/26/2006	0.187			OB05 C1	J13H14	9/25/2006	0.755								
OB04 C2	J13H26	9/26/2006	0.900			OB05 C2	J13H15	9/25/2006	-1.18								
						OB05 D3	J13H16	9/25/2006	0.521								
						OB05 D4	J13H17	9/25/2006	1.39								
						OB05 D5	J13H18	9/25/2006	0.238								
						OB05 D6	J13H19	9/25/2006	0.578								
						OB05 E7	J13HD2	9/26/2006	0.483								
						OB05 E8	J13HD3	9/26/2006	0.580								
						OB05 E9	J13H20	9/25/2006	-0.303								
						OB05 E10	J13H21	9/25/2006	-0.367								

24 100-B-14:1 OB04, OB05, and OB06 Carbon-14 Statistical Computation Input Data

			Carbon-14						Carbon-14						Carbon-14		
95% UCL value based on			Radionuclide data set. Use nonparametric z-statistic.			95% UCL value based on			Radionuclide data set. Use nonparametric z-statistic.			95% UCL value based on			Radionuclide data set. Use nonparametric z-statistic.		
N			12			N			20			N			8		
% < Detection limit			100%			% < Detection limit			100%			% < Detection limit			100%		
Mean			0.190			Mean			0.206			Mean			0.154		
Standard deviation			0.653			Standard deviation			0.688			Standard deviation			0.545		
Z-statistic			1.645			Z-statistic			1.645			Z-statistic			1.645		
95% UCL on mean			0.500			95% UCL on mean			0.459			95% UCL on mean			0.470		
Maximum value			1.01			Maximum value			1.72			Maximum value			1.00		
Statistical value			0.500			Statistical value			0.459			Statistical value			0.470		

35 OB = overburden
36 U = undetected
37 UCL = upper confidence limit

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron

Date 11/07/06

Calc. No. 0100B-CA-V0287

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Project 100-B/C Remaining Pipes and Sewers Field Remediation

Job No. 14655

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Date 11/21/06

Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

Sheet No. 13 of 16

Ecology Software (MTCASat) Results (Overburden)

DATA	ID	Hexavalent Chromium 95% UCL Calculation									
0.34	J127W4	0.24	J127V1	0.27	J127N8	0.11	J127K1	0.23	J127X8		
0.27	J127W3	0.21	J127T4	0.35	J127N7	0.11	J127K2	0.28	J127X5		
0.10	J127W1	0.29	J127T3	0.75	J127N4	0.28	J127K3	0.24	J127X4	Number of samples	Uncensored values
0.10	J127W2	0.26	J127T2	0.61	J127N5	0.31	J127H5	0.10	J127X3	Uncensored	88
0.35	J127W0	0.25	J127T1	0.60	J127N6	0.10	J127J5/J127J6	0.10	J127X2	Censored	
0.26	J127V9	0.10	J127T0	0.24	J127T7	0.23	J127J7/J127J8	0.24	J127X1	Detection limit or PQL	Lognormal mean
0.36	J127V8	0.30	J127R9	0.74	J127N2/J127N3	0.11	J127J9	0.27	J127X0	Method detection limit	Std. devn.
0.25	J127V7	0.23	J127R8	0.30	J127M8/J127M9	0.33	J127H4	0.22	J127W9	TOTAL	Median
0.26	J127V3	0.27	J127R7	0.75	J127N0	0.10	J127H1	0.10	J127W8	88	Min.
0.40	J127V4	0.22	J127R6	0.28	J127N1	0.10	J127F2	0.10	J127W7		Max.
0.11	J127V5	0.10	J127R5	0.11	J127M7	0.11	J127F3	0.10	J127W6		
0.11	J127V6	0.10	J127R4	0.26	J127M5/J127M6	0.10	J127F6	0.10	J127W5	Lognormal distribution?	Normal distribution?
0.11	J127V2	0.24	J127R3	0.28	J127M4	0.10	J127F7			r-squared is: 0.859	r-squared is: 0.746
1.0	J127X7	0.10	J127P1	0.11	J127H7	0.10	J127F4			Recommendations:	
0.10	J127T6	0.11	J127P2	0.27	J127K7	0.10	J127F5			Reject BOTH lognormal and normal distributions.	
0.28	J127T5	0.31	J127P3	0.39	J127K6	0.10	J127F8				
0.27	J127T8	0.28	J127R2	0.32	J127K5	0.10	J127F9				
0.32	J127T9	0.29	J127P0	0.11	J127K4	0.10	J127H0			UCL (based on Z-statistic) is	0.27
0.11	J127V0	0.26	J127N9	0.32	J127K0	0.34	J127X6				

21 PQL = practical quantitation limit

22 UCL = upper confidence limit

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron

Project 100-B/C Remaining Pipes and Sewers Field Remediation

Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

Date 11/07/06

Job No. 14655

Calc. No. 0100B-CA-V0287

Checked W. S. Thompson

Rev. No. 1

Date 11/8/06

Sheet No. 14 of 16

1 Split/Duplicate Analysis

Sample Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Thorium-228			Thorium-232			Hexavalent Chromium		
			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 B6	J127L2	5/31/06	13.2		0.26	0.481		0.045	0.654		0.11	0.618		0.029	0.654		0.11	0.21		0.21
Duplicate of J127L2	J127L3	5/31/06	9.01		0.28	0.376		0.043	0.516		0.15	0.478		0.031	0.516		0.15	0.24		0.20
Split of J127L2	J127F0	5/31/06	--		--	--		--	--		--	--		--	--		--	0.350	U	0.350

6 Analysis:

TDL		0.5	0.1	0.2	1	1	0.5
Duplicate Analysis	Both > PQL/MDA?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	No - evaluate difference
	Both >5xTDL?	Yes (calc RPD)	No - evaluate difference	No - evaluate difference	No - evaluate difference	No - evaluate difference	
	RPD	38%					
	Difference >2xTDL?	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable
Split Analysis	Both > PQL?						No - evaluate difference
	Both >5xTDL?						
	RPD						
	Difference >2xTDL?						No - acceptable

16

Sample Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Thorium-228			Thorium-232		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
DZ A3	J12783	5/30/06	11.3		0.19	0.452		0.034	0.687		0.086	0.630		0.018	0.687		0.086
Duplicate of J12783	J12791	5/30/06	10.7		0.26	0.444		0.049	0.716		0.11	0.558		0.031	0.716		0.11

21 Analysis:

TDL		0.5	0.1	0.2	1	1
Duplicate Analysis	Both > MDA?	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
	RPD	5.5%				
	Difference >2xTDL?	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable

27

Sample Area	Sample Number	Sample Date	Cesium-137			Potassium-40			Radium-226			Radium-228			Thorium-228			Thorium-232			Hexavalent Chromium		
			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
OB L5	J127N2	6/7/06	0.069		0.032	13.2		0.29	0.660		0.058	0.900		0.12	0.784		0.035	0.900		0.12	0.75		0.21
Duplicate of J127N2	J127N3	6/7/06	0.033		0.024	11.8		0.26	0.596		0.048	0.888		0.11	0.665		0.028	0.888		0.11	0.72		0.21
Split of J127N2	J127F1	6/7/06	0.0340		0.0189	--		--	--		--	--		--	--		--	--		--	0.350	U	0.350

32 Analysis:

TDL		0.1	0.5	0.1	0.2	1	1	0.5
Duplicate Analysis	Both > PQL/MDA?	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	No - evaluate difference	No - evaluate difference	No - evaluate difference
	RPD		11%	10%				
	Difference >2xTDL?	No - acceptable	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable
Split Analysis	Both > PQL/MDA?	Yes (continue)						No - evaluate difference
	Both >5xTDL?	No - evaluate difference						
	RPD							
	Difference >2xTDL?	No - acceptable						No - acceptable

42 -- = not reported

43 DZ = deep zone

44 OB = overburden

45 PQL = practical quantitation limit

46 Q = qualifier

RPD = relative percent difference

SZ = shallow zone

TDL = target detection limit

U = undetected

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron
Project 100-B/C Remaining Pipes and Sewers Field Remediation
Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

Date 11/07/06
Job No. 14655

Calc. No. 0100B-CA-V0287
Checked W. S. Thompson

Rev. No. 1
Date 11/8/06
Sheet No. 15 of 16

1 Split/Duplicate Analysis (continued)

Sample Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Thorium-228			Thorium-232			Hexavalent Chromium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL
OB L6	J127M8	6/7/06	13.7		0.33	0.632		0.057	0.853		0.13	0.785		0.035	0.853		0.13	0.23		0.21
Duplicate of J127M8	J127M9	6/7/06	13.6		0.27	0.549		0.044	0.792		0.12	0.640		0.030	0.792		0.12	0.36		0.21
Split of J127M9	J127D9	6/7/06	--		--	--		--	--		--	--		--	--		--	0.350	U	0.350

6 Analysis:

TDL		0.5	0.1	0.2	1	1	0.5
Duplicate Analysis	Both > PQL/MDA?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No - evaluate difference	No - evaluate difference	No - evaluate difference	No - evaluate difference
	RPD	0.73%	14%				
	Difference >2xTDL?	Not applicable	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable
Split Analysis	Both > PQL?						No - evaluate difference
	Both >5xTDL?						
	RPD						
	Difference >2xTDL?						No - acceptable

16

Sample Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Thorium-228			Thorium-232			Hexavalent Chromium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL
OB M10	J127M5	6/7/06	13.8		0.31	0.512		0.051	0.798		0.11	0.707		0.030	0.798		0.11	0.22		0.21
Duplicate of J127M5	J127M6	6/7/06	24.2		0.41	1.03		0.088	1.43		0.18	1.26		0.063	1.43		0.18	0.29		0.21
Split of J127M5	J127D8	6/7/06	--		--	--		--	--		--	--		--	--		--	0.350	U	0.350

21 Analysis:

TDL		0.5	0.1	0.2	1	1	0.5
Duplicate Analysis	Both > PQL/MDA?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No - evaluate difference	No - evaluate difference	No - evaluate difference	No - evaluate difference
	RPD	55%	67%				
	Difference >2xTDL?	Not applicable	Not applicable	Yes - assess further	No - acceptable	No - acceptable	No - acceptable
Split Analysis	Both > PQL?						No - evaluate difference
	Both >5xTDL?						
	RPD						
	Difference >2xTDL?						No - acceptable

31

Sample Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Thorium-228			Thorium-232		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB P2	J127J5	6/1/06	22.8		0.37	0.890		0.080	1.22		0.16	1.23		0.057	1.22		0.16
Duplicate of J127J5	J127J6	6/1/06	12.3		0.35	0.524		0.060	0.767		0.15	0.679		0.039	0.767		0.15
Split of J127J5	J127D6	6/1/06	--		--	--		--	--		--	--		--	--		--

36 Analysis:

TDL		0.5	0.1	0.2	1	1
Duplicate Analysis	Both > MDA?	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)	Yes (continue)
	Both >5xTDL?	Yes (calc RPD)	Yes (calc RPD)	No - evaluate difference	No - evaluate difference	No - evaluate difference
	RPD	60%	52%			
	Difference >2xTDL?	Not applicable	Not applicable	Yes - assess further	No - acceptable	No - acceptable

42 -- = not reported
43 OB = overburden
44 PQL = practical quantitation limit
45 Q = qualifier

RPD = relative percent difference
TDL = target detection limit
U = undetected

CALCULATION SHEET

Washington Closure Hanford

Originator J. M. Capron
Project 100-B/C Remaining Pipes and Sewers Field Remediation
Subject 100-B-14:1 Pipelines Cleanup Verification 95% UCL Calculations

Date 11/07/06
Job No. 14655

Calc. No. 0100B-CA-V0287
Checked W. S. Thompson

Rev. No. 1
Date 11/8/06
Sheet No. 16 of 16

1 Split/Duplicate Analysis (continued)

Sample Area	Sample Number	Sample Date	Potassium-40			Radium-226			Radium-228			Thorium-228			Thorium-232			Hexavalent Chromium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL
OB P3	J127J7	6/1/06	12.9		0.28	0.505		0.050	0.786		0.11	0.682		0.027	0.786		0.11	0.22		0.20
Duplicate of J127J7	J127J8	6/1/06	11.8		0.23	0.462		0.041	0.737		0.10	0.582		0.028	0.737		0.10	0.24		0.20
Split of J127J7	J127D7	6/1/06	--		--	--		--	--		--	--		--	--		--	0.350	U	0.350

6 Analysis:

TDL		0.5	0.1	0.2	1	1	0.5
Duplicate Analysis	Both > PQL/MDA?	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
	RPD	8.9%					
	Difference >2xTDL?	Not applicable	No - acceptable	No - acceptable	No - acceptable	No - acceptable	No - acceptable
Split Analysis	Both > PQL?						No - evaluate difference
	Both >5xTDL?						
	RPD						
	Difference >2xTDL?						No - acceptable

16

Sample Area	Sample Number	Sample Date	Carbon-14			Sample Area	Sample Number	Sample Date	Carbon-14		
			pCi/g	Q	MDA				pCi/g	Q	MDA
OB01 A1	J13FW9	9/21/06	0.632	U	2.1	OB05 A1	J13H05	9/25/06	0.396	U	2.2
Duplicate of J13FW9	J13FX0	9/21/06	275		2.4	Duplicate of J13H05	J13H09	9/25/06	-0.472	U	2.2
Split of J13FW9	J13HD8	9/21/06	-0.0788	U	0.839	Split of J13H05	J13HF2	9/25/06	1.55		0.850

21 Analysis:

TDL		2	2
Duplicate Analysis	Both > PQL/MDA?	No - evaluate difference	No - evaluate difference
	Both >5xTDL?		
	RPD		
	Difference >2xTDL?	Yes - assess further	No - acceptable
Split Analysis	Both > PQL?	No - evaluate difference	No - evaluate difference
	Both >5xTDL?		
	RPD		
	Difference >2xTDL?	No - acceptable	No - acceptable

31 -- = not reported

32 OB = overburden

33 PQL = practical quantitation limit

34 Q = qualifier

RPD = relative percent difference

TDL = target detection limit

U = undetected

Attachment 1. 100-B-14:1 Phase I Verification Sampling Results.

Sample Location	Sample Number	Sample Date	Americium-241			Carbon-14			Cesium-137			Cobalt-60			Europium-152			Europium-154		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Equipment blank	J127H6	6/1/06	0.22	U	0.22	0.830	U	2.3	0.023	U	0.023	0.025	U	0.025	0.062	U	0.062	0.085	U	0.085
SZ A1	J127J2	6/1/06	0.36	U	0.36	0.334	U	2.0	0.035	U	0.035	0.036	U	0.036	0.086	U	0.086	0.13	U	0.13
SZ A2	J127J1	6/1/06	0.37	U	0.37	0.904	U	2.1	0.036	U	0.036	0.041	U	0.041	0.10	U	0.10	0.13	U	0.13
SZ A3	J127J0	6/1/06	0.036	U	0.036	0.808	U	2.2	0.024	U	0.024	0.025	U	0.025	0.057	U	0.057	0.095	U	0.095
SZ A4	J127H9	6/1/06	0.096	U	0.096	1.83	U	2.2	0.017	U	0.017	0.017	U	0.017	0.043	U	0.043	0.054	U	0.054
SZ B5	J127H8	6/1/06	0.026	U	0.026	0.609	U	2.1	0.018	U	0.018	0.019	U	0.019	0.041	U	0.041	0.066	U	0.066
SZ B6	J127L2	5/31/06	0.13	U	0.13	0.918	U	3.3	0.023	U	0.023	0.024	U	0.024	0.059	U	0.059	0.077	U	0.077
Duplicate of J127L2	J127L3	5/31/06	0.26	U	0.26	-0.485	U	3.0	0.028	U	0.028	0.030	U	0.030	0.066	U	0.066	0.093	U	0.093
Split of J127L2	J127F0	5/31/06				0.102	U	0.806	-0.0123	U	0.0159	0.000153	U	0.0172	-0.0171	U	0.0409	-0.00434	U	0.0573
SZ B7	J127L1	5/31/06	0.35	U	0.35	0.319	U	3.1	0.037	U	0.037	0.040	U	0.040	0.099	U	0.099	0.13	U	0.13
SZ B8	J127L0	5/31/06	0.039	U	0.039	-0.706	U	3.0	0.031	U	0.031	0.026	U	0.026	0.063	U	0.063	0.11	U	0.11
SZ C9	J127K9	5/31/06	0.40	U	0.40	-2.04	U	3.8	0.041	U	0.041	0.039	U	0.039	0.11	U	0.11	0.14	U	0.14
SZ C10	J127K8	5/31/06	0.51	U	0.51	0.726	U	3.2	0.055	U	0.055	0.057	U	0.057	0.14	U	0.14	0.18	U	0.18
SZ C1	J127H3	5/30/06	0.15	U	0.15	0.018	U	2.6	0.045	U	0.045	0.044	U	0.044	0.094	U	0.094	0.15	U	0.15
SZ C2	J127H2	5/30/06	0.11	U	0.11	-0.693	U	2.4	0.10	U	0.10	0.14	U	0.14	0.14	U	0.14	0.46	U	0.46
SZ D3	J127J3	6/1/06	0.14	U	0.14	-0.197	U	2.3	0.023	U	0.023	0.025	U	0.025	0.062	U	0.062	0.074	U	0.074
SZ D4	J127J4	6/1/06	0.41	U	0.41	0.609	U	2.0	0.042	U	0.042	0.043	U	0.043	0.11	U	0.11	0.14	U	0.14
SZ D5	J127L4	6/6/06	0.15	U	0.15	-0.209	U	2.6	0.027	U	0.027	0.029	U	0.029	0.069	U	0.069	0.093	U	0.093
SZ D6	J127L5	6/6/06	0.15	U	0.15	0.151	U	2.6	0.061		0.035	0.030	U	0.030	0.071	U	0.071	0.090	U	0.090
SZ E7	J127L6	6/6/06	0.54	U	0.54	0.380	U	2.6	0.059	U	0.059	0.061	U	0.061	0.15	U	0.15	0.20	U	0.20
SZ E8	J127L7	6/6/06	0.25	U	0.25	-1.11	U	2.4	0.028	U	0.028	0.036	U	0.036	0.071	U	0.071	0.12	U	0.12
SZ E9	J127L8	6/6/06	0.032	U	0.032	-0.503	U	2.4	0.023	U	0.023	0.024	U	0.024	0.055	U	0.055	0.084	U	0.084
SZ E10	J127L9	6/6/06	0.15	U	0.15	-1.42	U	2.4	0.024	U	0.024	0.026	U	0.026	0.066	U	0.066	0.088	U	0.088
SZ F1	J127M3	6/7/06	0.24	U	0.24	-0.820	U	1.9	0.026	U	0.026	0.032	U	0.032	0.064	U	0.064	0.12	U	0.12
SZ F2	J127M0	6/6/06	0.52	U	0.52	0.038	U	2.6	0.053	U	0.053	0.058	U	0.058	0.14	U	0.14	0.19	U	0.19
SZ F3	J127M1	6/6/06	0.15	U	0.15	-0.705	U	2.5	0.026	U	0.026	0.028	U	0.028	0.066	U	0.066	0.084	U	0.084
SZ F4	J127M2	6/6/06	0.034	U	0.034	-0.265	U	2.6	0.025	U	0.025	0.027	U	0.027	0.058	U	0.058	0.097	U	0.097
SZ G5	J127P4	6/8/06	0.16	U	0.16	0.253	U	3.0	0.016	U	0.016	0.017	U	0.017	0.045	U	0.045	0.057	U	0.057
SZ G6	J127P5	6/8/06	0.092	U	0.092	-0.622	U	2.8	0.013	U	0.013	0.013	U	0.013	0.029	U	0.029	0.043	U	0.043
SZ G7	J127P6	6/8/06	0.014	U	0.014	258		2.5	0.010	U	0.010	0.010	U	0.010	0.022	U	0.022	0.037	U	0.037
SZ G8	J127P9	6/8/06	0.14	U	0.14	1.06	U	3.0	0.024	U	0.024	0.036	U	0.036	0.058	U	0.058	0.075	U	0.075
SZ H9	J127P7	6/8/06	0.054	U	0.054	-0.434	U	2.9	0.010	U	0.010	0.009	U	0.009	0.023	U	0.023	0.030	U	0.030
SZ H10	J127P8	6/8/06	0.030	U	0.030	-0.394	U	2.6	0.024	U	0.024	0.023	U	0.023	0.048	U	0.048	0.077	U	0.077
SZ H1	J127R0	6/8/06	0.43	U	0.43	0.117	U	2.8	0.046	U	0.046	0.060	U	0.060	0.12	U	0.12	0.17	U	0.17
SZ H2	J127R1	6/8/06	0.40	U	0.40	178		2.9	0.073	U	0.073	0.042	U	0.042	0.11	U	0.11	0.14	U	0.14

Note: The following abbreviations apply to all Attachment 1 and 2 tables.

Note: Data qualified with D or J are considered acceptable values.

D = diluted

DZ = deep zone

J = estimated

MDA = minimum detectable activity

OB = overburden

PQL = practical quantitation limit

Q = qualifier

SZ = shallow zone

U = undetected

Attachment	1	Sheet No.	1 of 12
Originator	J. M. Capron <i>JMC</i>	Date	11/07/06
Checked	W. S. Thompson <i>WST</i>	Date	11/8/06
Calc. No.	0100B-CA-V0287	Rev. No.	0

Attachment 1. 100-B-14:1 Phase I Verification Sampling Results.

Sample Location	Sample Number	Sample Date	Europium-155			Potassium-40			Radium-226			Radium-228			Ruthenium-106			Thorium-228		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
Equipment blank	J127H6	6/1/06	0.077	U	0.077	9.21		0.28	0.255		0.041	0.415		0.12				0.307		0.032
SZ A1	J127J2	6/1/06	0.12	U	0.12	15.2		0.34	0.917		0.074	1.24		0.15				1.17		0.047
SZ A2	J127J1	6/1/06	0.13	U	0.13	23.8		0.40	1.11		0.079	1.48		0.16				1.43		0.050
SZ A3	J127J0	6/1/06	0.054	U	0.054	16.1		0.35	0.671		0.038	0.996		0.12				1.16		0.045
SZ A4	J127H9	6/1/06	0.059	U	0.059	13.3		0.20	0.474		0.031	0.820		0.072				0.581		0.021
SZ B5	J127H8	6/1/06	0.032	U	0.043	13.2		0.20	0.493		0.036	0.786		0.088				0.682		0.022
SZ B6	J127L2	5/31/06	0.081	U	0.081	13.2		0.26	0.481		0.045	0.654		0.11				0.618		0.029
Duplicate of J127L2	J127L3	5/31/06	0.095	U	0.095	9.01		0.28	0.376		0.043	0.516		0.15				0.478		0.031
Split of J127L2	J127F0	5/31/06	0.0235	U	0.0400										-0.0231	U	0.136			
SZ B7	J127L1	5/31/06	0.13	U	0.13	16.1		0.40	0.661		0.076	0.966		0.15				0.967		0.051
SZ B8	J127L0	5/31/06	0.058	U	0.058	13.3		0.26	0.459		0.059	0.745		0.14				0.712		0.030
SZ C9	J127K9	5/31/06	0.14	U	0.14	22.5		0.35	0.759		0.081	1.37		0.18				1.26		0.056
SZ C10	J127K8	5/31/06	0.17	U	0.17	24.2		0.50	0.811		0.11	1.37		0.20				1.24		0.074
SZ C1	J127H3	5/30/06	0.11	U	0.11	11.6		0.64	0.548		0.071	0.681		0.20				0.610		0.050
SZ C2	J127H2	5/30/06	0.11	U	0.11	10.7		1.6	0.350		0.16	0.814		0.56				0.282		0.079
SZ D3	J127J3	6/1/06	0.086	U	0.086	15.1		0.23	0.595		0.048	0.999		0.10				0.782		0.029
SZ D4	J127J4	6/1/06	0.14	U	0.14	24.4		0.43	0.904		0.078	1.45		0.17				1.34		0.058
SZ D5	J127L4	6/6/06	0.091	U	0.091	14.9		0.26	0.556		0.050	0.926		0.10				0.695		0.034
SZ D6	J127L5	6/6/06	0.093	U	0.093	14.6		0.25	0.584		0.059	0.917		0.14				0.700		0.036
SZ E7	J127L6	6/6/06	0.21	U	0.21	28.3		0.52	0.956		0.12	1.36		0.29				1.47		0.077
SZ E8	J127L7	6/6/06	0.10	U	0.10	9.18		0.29	0.444		0.052	0.482		0.14				0.509		0.039
SZ E9	J127L8	6/6/06	0.050	U	0.050	11.2		0.28	0.473		0.035	0.666		0.10				0.606		0.028
SZ E10	J127L9	6/6/06	0.086	U	0.086	12.3		0.27	0.432		0.054	0.712		0.12				0.617		0.031
SZ F1	J127M3	6/7/06	0.094	U	0.094	10.9		0.27	0.374		0.060	0.637		0.12				0.538		0.034
SZ F2	J127M0	6/6/06	0.20	U	0.20	23.6		0.44	0.903		0.11	1.29		0.21				1.30		0.071
SZ F3	J127M1	6/6/06	0.091	U	0.091	12.1		0.29	0.434		0.053	0.814		0.12				0.627		0.033
SZ F4	J127M2	6/6/06	0.053	U	0.053	11.7		0.25	0.520		0.050	0.786		0.10				0.772		0.045
SZ G5	J127P4	6/8/06	0.084	U	0.084	24.7		0.16	0.986		0.034	1.39		0.060				1.32		0.023
SZ G6	J127P5	6/8/06	0.058	U	0.058	10.9		0.14	0.447		0.023	0.586		0.053				0.557		0.017
SZ G7	J127P6	6/8/06	0.050	U	0.050	13.3		0.10	0.547		0.020	0.836		0.044				0.739		0.012
SZ G8	J127P9	6/8/06	0.080	U	0.080	12.7		0.25	0.568		0.046	0.778		0.11				0.687		0.030
SZ H9	J127P7	6/8/06	0.049	U	0.049	12.7		0.099	0.506		0.019	0.764		0.042				0.634		0.012
SZ H10	J127P8	6/8/06	0.047	U	0.047	13.2		0.27	0.518		0.041	0.733		0.096				0.802		0.041
SZ H1	J127R0	6/8/06	0.17	U	0.17	25.0		0.33	0.878		0.085	1.28		0.19				1.20		0.061
SZ H2	J127R1	6/8/06	0.16	U	0.16	25.6		0.38	0.959		0.090	1.32		0.17				1.31		0.058

Attachment	1	Sheet No.	2 of 12
Originator	J. M. Capron	Date	11/07/06
Checked	W. S. Thompson	Date	11/9/06
Calc. No.	0100B-CA-V0287	Rev. No.	0

Attachment 1. 100-B-14:1 Phase I Verification Sampling Results.

Sample Location	Sample Number	Sample Date	Thorium-232			Tritium			Uranium-235			Uranium-238			Hexavalent Chromium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL
Equipment blank	J127H6	6/1/06	0.415		0.12				0.10	U	0.10	3.1	U	3.1	0.20	U	0.20
SZ A1	J127J2	6/1/06	1.24		0.15				0.17	U	0.17	4.6	U	4.6	0.21	U	0.21
SZ A2	J127J1	6/1/06	1.48		0.16				0.16	U	0.16	4.6	U	4.6	0.21	U	0.21
SZ A3	J127J0	6/1/06	0.996		0.12				0.095	U	0.095	3.3	U	3.3	0.21	U	0.21
SZ A4	J127H9	6/1/06	0.820		0.072				0.076	U	0.076	1.8	U	1.8	0.21	U	0.21
SZ B5	J127H8	6/1/06	0.786		0.088				0.070	U	0.070	2.1	U	2.1	0.21	U	0.21
SZ B6	J127L2	5/31/06	0.654		0.11	-0.458	UJ	2.6	0.10	U	0.10	2.5	U	2.5	0.21		0.21
Duplicate of J127L2	J127L3	5/31/06	0.516		0.15	-0.652	UJ	2.4	0.13	U	0.13	3.7	U	3.7	0.24		0.20
Split of J127L2	J127F0	5/31/06													0.350	U	0.350
SZ B7	J127L1	5/31/06	0.966		0.15	-0.295	UJ	2.5	0.16	U	0.16	4.5	U	4.5	0.32		0.21
SZ B8	J127L0	5/31/06	0.745		0.14	0.147	UJ	2.5	0.10	U	0.10	3.3	U	3.3	0.21	U	0.21
SZ C9	J127K9	5/31/06	1.37		0.18	-1.89	UJ	3.0	0.17	U	0.17	5.4	U	5.4	0.34		0.21
SZ C10	J127K8	5/31/06	1.37		0.20	-0.207	UJ	2.6	0.22	U	0.22	7.2	U	7.2	2.6		0.21
SZ C1	J127H3	5/30/06	0.681		0.20	-0.070	U	2.4	0.16	U	0.16	4.9	U	4.9	0.21	U	0.21
SZ C2	J127H2	5/30/06	0.814		0.56	0.721	U	2.3	0.16	U	0.16	17	U	17	0.21	U	0.21
SZ D3	J127J3	6/1/06	0.999		0.10				0.10	U	0.10	2.7	U	2.7	0.21	U	0.21
SZ D4	J127J4	6/1/06	1.45		0.17				0.18	U	0.18	7.0	U	7.0	0.22	U	0.22
SZ D5	J127L4	6/6/06	0.926		0.10				0.12	U	0.12	5.4	U	5.4	0.21	U	0.21
SZ D6	J127L5	6/6/06	0.917		0.14				0.12	U	0.12	3.0	U	3.0	0.21	U	0.21
SZ E7	J127L6	6/6/06	1.36		0.29				0.24	U	0.24	6.9	U	6.9	0.29		0.22
SZ E8	J127L7	6/6/06	0.482		0.14				0.14	U	0.14	4.0	U	4.0	0.31		0.21
SZ E9	J127L8	6/6/06	0.666		0.10				0.090	U	0.090	2.9	U	2.9	0.27		0.21
SZ E10	J127L9	6/6/06	0.712		0.12				0.11	U	0.11	2.7	U	2.7	0.21	U	0.21
SZ F1	J127M3	6/7/06	0.637		0.12				0.13	U	0.13	3.9	U	3.9	0.21	U	0.21
SZ F2	J127M0	6/6/06	1.29		0.21				0.22	U	0.22	6.5	U	6.5	0.42		0.22
SZ F3	J127M1	6/6/06	0.814		0.12				0.12	U	0.12	2.8	U	2.8	0.28		0.21
SZ F4	J127M2	6/6/06	0.786		0.10				0.095	U	0.095	3.2	U	3.2	0.31		0.21
SZ G5	J127P4	6/8/06	1.39		0.060				0.11	U	0.11	2.8	U	2.8	0.37		0.21
SZ G6	J127P5	6/8/06	0.586		0.053				0.058	U	0.058	1.6	U	1.6	0.21	U	0.21
SZ G7	J127P6	6/8/06	0.836		0.044				0.054	U	0.054	1.2	U	1.2	0.23		0.21
SZ G8	J127P9	6/8/06	0.778		0.11				0.10	U	0.10	2.7	U	2.7	0.91		0.25
SZ H9	J127P7	6/8/06	0.764		0.042				0.058	U	0.058	1.8	U	1.8	0.21	U	0.21
SZ H10	J127P8	6/8/06	0.733		0.096				0.083	U	0.083	2.7	U	2.7	0.39		0.21
SZ H1	J127R0	6/8/06	1.28		0.19				0.21	U	0.21	6.2	U	6.2	0.21	U	0.21
SZ H2	J127R1	6/8/06	1.32		0.17				0.28	U	0.28	5.2	U	5.2	0.33		0.21

Attachment	I	Sheet No.	3 of 12
Originator	J. M. Capron	Date	11/07/06
Checked	W. S. Thompson <i>WST</i>	Date	11/8/06
Calc. No.	0100B-CA-V0287	Rev. No.	0

Attachment 1. 100-B-14:1 Phase I Verification Sampling Results.

Sample Location	Sample Number	Sample Date	Americium-241			Carbon-14			Cesium-137			Cobalt-60			Europium-152			Europium-154		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
DZ A1	J12785	5/30/06	0.017	U	0.017	0.483	U	2.2	0.047	U	0.016	0.013	U	0.013	0.027	U	0.027	0.043	U	0.043
DZ A2	J12784	5/30/06	0.11	U	0.11	1.10	U	2.1	0.012	U	0.012	0.012	U	0.012	0.029	U	0.029	0.043	U	0.043
Split of J12784	J12795	5/30/06				0.269	U	0.748	-0.00586	U	0.0136	0.00244	U	0.0147	-0.0140	U	0.0370	-0.00941	U	0.0439
DZ A3	J12783	5/30/06	0.063	U	0.063	-0.650	U	2.1	0.020	U	0.020	0.018	U	0.018	0.040	U	0.040	0.064	U	0.064
Duplicate of J12783	J12791	5/30/06	0.14	U	0.14	0.079	U	2.2	0.025	U	0.025	0.026	U	0.026	0.060	U	0.060	0.079	U	0.079
DZ B4	J12782	5/30/06	0.15	U	0.15	-0.061	U	2.3	0.016	U	0.016	0.017	U	0.017	0.043	U	0.043	0.054	U	0.054
DZ B5	J12786	5/30/06	0.064	U	0.064	-0.339	U	1.9	0.011	U	0.011	0.023	U	0.023	0.029	U	0.029	0.037	U	0.037
DZ B6	J12787	5/30/06	0.44	U	0.44	0.445	U	2.0	0.051	U	0.051	0.050	U	0.050	0.13	U	0.13	0.16	U	0.16
DZ C7	J12788	5/30/06	0.15	U	0.15	0.601	U	2.0	0.206		0.036	0.029	U	0.029	0.072	U	0.072	0.082	U	0.082
DZ C8	J12789	5/30/06	0.16	U	0.16	-0.399	U	2.0	0.230		0.050	0.049	U	0.049	0.10	U	0.10	0.16	U	0.16
DZ C9	J12790	5/30/06	0.35	U	0.35	0.369	U	2.0	0.041	U	0.041	0.040	U	0.040	0.089	U	0.089	0.13	U	0.13

Sample Location	Sample Number	Sample Date	Europium-155			Potassium-40			Radium-226			Radium-228			Ruthenium-106			Thorium-232		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
DZ A1	J12785	5/30/06	0.051	U	0.051	14.8		0.12	0.568		0.024	0.881		0.056				1.01		0.021
DZ A2	J12784	5/30/06	0.041	U	0.041	9.31		0.12	0.376		0.025	0.611		0.055				0.633		0.023
Split of J12784	J12795	5/30/06	0.0281	U	0.0464										-0.00579	U	0.116			
DZ A3	J12783	5/30/06	0.045	U	0.045	11.3		0.19	0.452		0.034	0.687		0.086				0.630		0.018
Duplicate of J12783	J12791	5/30/06	0.084	U	0.084	10.7		0.26	0.444		0.049	0.716		0.11				0.558		0.031
DZ B4	J12782	5/30/06	0.073	U	0.073	19.1		0.16	0.703		0.029	1.16		0.057				1.05		0.021
DZ B5	J12786	5/30/06	0.038	U	0.038	11.6		0.11	0.419		0.023	0.706		0.059				0.560		0.014
DZ B6	J12787	5/30/06	0.16	U	0.16	23.5		0.43	0.821		0.093	1.31		0.17				1.26		0.063
DZ C7	J12788	5/30/06	0.094	U	0.094	11.7		0.31	0.431		0.050	0.694		0.12				0.655		0.034
DZ C8	J12789	5/30/06	0.11	U	0.11	11.6		0.56	0.382		0.085	0.618		0.24				0.720		0.076
DZ C9	J12790	5/30/06	0.12	U	0.12	10.6		0.38	0.414		0.075	0.657		0.18				0.702		0.069

Sample Location	Sample Number	Sample Date	Thorium-232			Tritium			Uranium-235			Uranium-238			Hexavalent Chromium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	mg/kg	Q	PQL
DZ A1	J12785	5/30/06	0.881		0.056	-1.08	U	2.4	0.073	U	0.073	2.8	U	2.8	0.21	U	0.21
DZ A2	J12784	5/30/06	0.611		0.055	-0.946	U	2.4	0.057	U	0.057	1.6	U	1.6	0.21	U	0.21
Split of J12784	J12795	5/30/06				0.0183	U	0.0554							0.350	U	0.350
DZ A3	J12783	5/30/06	0.687		0.086	-1.38	U	2.4	0.065	U	0.065	2.1	U	2.1	0.21	U	0.21
Duplicate of J12783	J12791	5/30/06	0.716		0.11	-0.696	U	2.5	0.11	U	0.11	2.8	U	2.8	0.21	U	0.21
DZ B4	J12782	5/30/06	1.16		0.057	-1.54	U	2.5	0.068	U	0.068	2.0	U	2.0	0.21	U	0.21
DZ B5	J12786	5/30/06	0.706		0.059	-0.589	U	2.1	0.052	U	0.052	1.3	U	1.3	0.21	U	0.21
DZ B6	J12787	5/30/06	1.31		0.17	-0.992	U	2.2	0.20	U	0.20	6.4	U	6.4	0.21	U	0.21
DZ C7	J12788	5/30/06	0.694		0.12	-0.446	U	2.2	0.12	U	0.12	3.2	U	3.2	0.21	U	0.21
DZ C8	J12789	5/30/06	0.618		0.24	-1.43	U	2.2	0.16	U	0.16	5.8	U	5.8	0.21	U	0.21
DZ C9	J12790	5/30/06	0.657		0.18	-1.10	U	2.2	0.17	U	0.17	5.4	U	5.4	0.21	U	0.21

Attachment 1
 Originator J. M. Capron
 Checked W. S. Thompson
 Calc. No. 0100B-CA-V0287
 Sheet No. 4 of 12
 Date 11/07/06
 Date 11/10/06
 Rev. No. 0

Attachment 1. 100-B-14:1 Phase I Verification Sampling Results.

Sample Location	Sample Number	Sample Date	Americium-241			Carbon-14			Cesium-137			Cobalt-60			Europium-152			Europium-154		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB A1	J127W4	6/19/06	0.31	U	0.31	-1.06	U	3.0	0.042	U	0.042	0.042	U	0.042	0.092	U	0.092	0.15	U	0.15
OB A2	J127W3	6/19/06	0.041	U	0.041	-0.615	U	3.6	0.029	U	0.029	0.035	U	0.035	0.084	U	0.084	0.12	U	0.12
OB A3	J127W1	6/19/06	0.45	U	0.45	-0.298	U	3.3	0.048	U	0.048	0.051	U	0.051	0.13	U	0.13	0.15	U	0.15
OB A4	J127W2	6/19/06	0.43	U	0.43	-0.161	U	2.9	0.10	U	0.10	0.098	U	0.098	0.22	U	0.22	0.32	U	0.32
OB B5	J127W0	6/14/06	0.25	U	0.25	-0.643	U	1.9	0.035	U	0.035	0.037	U	0.037	0.082	U	0.082	0.12	U	0.12
OB B6	J127V9	6/14/06	0.11	U	0.11	-0.395	U	1.9	0.13	U	0.13	0.17	U	0.17	0.17	U	0.17	0.54	U	0.54
OB B7	J127V8	6/14/06	0.45	U	0.45	-1.40	U	2.0	0.047	U	0.047	0.053	U	0.053	0.12	U	0.12	0.17	U	0.17
OB B8	J127V7	6/14/06	0.038	U	0.038	-2.07	U	2.5	0.024	U	0.024	0.025	U	0.025	0.055	U	0.055	0.090	U	0.090
OB C9	J127V3	6/14/06	0.26	U	0.26	-0.548	U	2.0	0.039	U	0.039	0.043	U	0.043	0.080	U	0.080	0.13	U	0.13
OB C10	J127V4	6/14/06	0.17	U	0.17	8.87		2.2	0.031	U	0.031	0.033	U	0.033	0.077	U	0.077	0.098	U	0.098
OB C1	J127V5	6/14/06	0.39	U	0.39	-0.743	U	2.2	0.052	U	0.052	0.043	U	0.043	0.12	U	0.12	0.15	U	0.15
OB C2	J127V6	6/14/06	0.14	U	0.14	-0.966	U	2.4	0.080		0.030	0.026	U	0.026	0.063	U	0.063	0.076	U	0.076
OB D3	J127V2	6/13/06	0.062	U	0.062	-0.409	U	3.3	0.011	U	0.011	0.011	U	0.011	0.027	U	0.027	0.037	U	0.037
OB D4	J127X7	6/19/06	0.49	U	0.49	-1.87	U	4.4	0.196		0.053	0.050	U	0.050	0.14	U	0.14	0.16	U	0.16
OB D5	J127T6	6/12/06	0.027	U	0.027	-1.38	U	2.7	0.020	U	0.020	0.026	U	0.026	0.051	U	0.051	0.082	U	0.082
OB D6	J127T5	6/12/06	0.49	U	0.49	-1.18	U	2.4	0.052	U	0.052	0.050	U	0.050	0.14	U	0.14	0.17	U	0.17
OB E7	J127T8	6/13/06	0.27	U	0.27	1.15	U	3.3	0.034	U	0.034	0.032	U	0.032	0.079	U	0.079	0.11	U	0.11
OB E8	J127T9	6/13/06	0.14	U	0.14	0.167	U	3.3	0.028	U	0.028	0.026	U	0.026	0.063	U	0.063	0.086	U	0.086
OB E9	J127V0	6/13/06	0.16	U	0.16	0.461	U	3.1	0.016	U	0.016	0.017	U	0.017	0.044	U	0.044	0.053	U	0.053
OB E10	J127V1	6/13/06	0.12	U	0.12	8.66		3.0	0.014	U	0.014	0.014	U	0.014	0.033	U	0.033	0.048	U	0.048
OB F1	J127T4	6/12/06	0.028	U	0.028	83.3		2.2	0.020	U	0.020	0.028	U	0.028	0.061	U	0.061	0.084	U	0.084
OB F2	J127T3	6/12/06	0.26	U	0.26	-0.104	U	2.7	0.032	U	0.032	0.033	U	0.033	0.071	U	0.071	0.11	U	0.11
OB F3	J127T2	6/12/06	0.36	U	0.36	-1.17	U	2.2	0.037	U	0.037	0.043	U	0.043	0.10	U	0.10	0.12	U	0.12
OB F4	J127T1	6/12/06	0.37	U	0.37	-2.66	U	2.7	0.037	U	0.037	0.039	U	0.039	0.11	U	0.11	0.12	U	0.12
OB G5	J127T0	6/12/06	0.12	U	0.12	-1.76	U	2.2	0.021	U	0.021	0.022	U	0.022	0.052	U	0.052	0.070	U	0.070
OB G6	J127R9	6/12/06	0.026	U	0.026	-1.22	U	2.3	0.021	U	0.021	0.024	U	0.024	0.052	U	0.052	0.071	U	0.071
OB G7	J127R8	6/12/06	0.19	U	0.19	-1.27	U	2.1	0.026	U	0.026	0.027	U	0.027	0.062	U	0.062	0.094	U	0.094
OB G8	J127R7	6/12/06	0.13	U	0.13	8.08		2.6	0.024	U	0.024	0.024	U	0.024	0.055	U	0.055	0.082	U	0.082
OB H9	J127R6	6/12/06	0.41	U	0.41	-2.57	U	2.3	0.042	U	0.042	0.043	U	0.043	0.12	U	0.12	0.14	U	0.14
OB H10	J127R5	6/12/06	0.37	U	0.37	-1.87	U	2.4	0.040	U	0.040	0.042	U	0.042	0.10	U	0.10	0.13	U	0.13
OB H1	J127R4	6/12/06	0.13	U	0.13	-1.55	U	2.4	0.023	U	0.023	0.024	U	0.024	0.059	U	0.059	0.071	U	0.071
OB H2	J127R3	6/12/06	0.034	U	0.034	-0.091	U	2.3	0.026	U	0.026	0.025	U	0.025	0.054	U	0.054	0.088	U	0.088
OB I3	J127P1	6/8/06	0.13	U	0.13	0.522	U	2.4	0.023	U	0.023	0.023	U	0.023	0.056	U	0.056	0.073	U	0.073
OB I4	J127P2	6/8/06	0.033	U	0.033	-0.993	U	2.6	0.025	U	0.025	0.027	U	0.027	0.054	U	0.054	0.082	U	0.082
OB I5	J127P3	6/8/06	0.13	U	0.13	0.562	U	3.6	0.030	U	0.030	0.021	U	0.021	0.053	U	0.053	0.074	U	0.074
OB I6	J127R2	6/12/06	0.24	U	0.24	-0.411	U	2.2	0.033	U	0.033	0.038	U	0.038	0.079	U	0.079	0.12	U	0.12
OB J7	J127P0	6/8/06	0.033	U	0.033	0.789	U	2.3	0.024	U	0.024	0.026	U	0.026	0.049	U	0.049	0.084	U	0.084
OB J8	J127N9	6/8/06	0.38	U	0.38	0.634	U	2.3	0.036	U	0.036	0.040	U	0.040	0.11	U	0.11	0.13	U	0.13
OB J9	J127N8	6/7/06	0.13	U	0.13	79.0		2.1	0.023	U	0.023	0.033	U	0.033	0.056	U	0.056	0.071	U	0.071
OB J10	J127N7	6/7/06	0.031	U	0.031	-0.798	U	2.0	0.023	U	0.023	0.023	U	0.023	0.052	U	0.052	0.086	U	0.086

Attachment	1	Sheet No.	5 of 12
Originator	J. M. Capron	Date	11/07/06
Checked	W. S. Thompson	Date	11/18/06
Calc. No.	0100B-CA-V0287	Rev. No.	0

Attachment 1. 100-B-14:1 Phase I Verification Sampling Results.

Sample Location	Sample Number	Sample Date	Americium-241			Carbon-14			Cesium-137			Cobalt-60			Europium-152			Europium-154		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB K1	J127N4	6/7/06	0.41	U	0.41	-0.630	U	2.0	0.043	U	0.043	0.042	U	0.042	0.11	U	0.11	0.14	U	0.14
OB K2	J127N5	6/7/06	0.41	U	0.41	379		3.0	0.043	U	0.043	0.042	U	0.042	0.11	U	0.11	0.14	U	0.14
OB K3	J127N6	6/7/06	0.27	U	0.27	-0.750	U	1.9	0.030	U	0.030	0.035	U	0.035	0.076	U	0.076	0.11	U	0.11
OB K4	J127T7	6/12/06	0.032	U	0.032	-1.53	U	2.3	0.024	U	0.024	0.030	U	0.030	0.062	U	0.062	0.090	U	0.090
OB L5	J127N2	6/7/06	0.041	U	0.041	-1.18	U	1.9	0.069		0.032	0.031	U	0.031	0.071	U	0.071	0.10	U	0.10
Duplicate of J127N2	J127N3	6/7/06	0.14	U	0.14	-0.874	U	1.9	0.033		0.024	0.023	U	0.023	0.061	U	0.061	0.080	U	0.080
Split of J127N2	J127F1	6/7/06				-0.375	U	0.822	0.0340		0.0189	-0.000263	U	0.0174	0.00280	U	0.0427	-0.00932	U	0.0562
OB L6	J127M8	6/7/06	0.040	U	0.040	-0.932	U	2.0	0.030	U	0.030	0.028	U	0.028	0.072	U	0.072	0.11	U	0.11
Duplicate of J127M8	J127M9	6/7/06	0.14	U	0.14	-0.596	U	1.9	0.025	U	0.025	0.026	U	0.026	0.062	U	0.062	0.081	U	0.081
Split of J127M9	J127D9	6/7/06				0.290	U	0.823	-0.00761	U	0.0191	0.00238	U	0.0221	-0.00521	U	0.0452	-0.000304	U	0.0740
OB L7	J127N0	6/7/06	0.46	U	0.46	0.115	U	2.1	0.173		0.053	0.049	U	0.049	0.13	U	0.13	0.16	U	0.16
OB L8	J127N1	6/7/06	0.28	U	0.28	25.1		1.9	0.032	U	0.032	0.043	U	0.043	0.081	U	0.081	0.14	U	0.14
OB M9	J127M7	6/7/06	0.30	U	0.30	-1.19	U	2.1	0.032	U	0.032	0.042	U	0.042	0.079	U	0.079	0.14	U	0.14
OB M10	J127M5	6/7/06	0.16	U	0.16	-0.774	U	2.0	0.027	U	0.027	0.026	U	0.026	0.070	U	0.070	0.086	U	0.086
Duplicate of J127M5	J127M6	6/7/06	0.61	U	0.61	-1.27	U	2.2	0.044	U	0.044	0.045	U	0.045	0.13	U	0.13	0.15	U	0.15
Split of J127M5	J127D6	6/7/06				-0.0387	U	0.822	-0.0149	U	0.0165	0.00941	U	0.0192	-0.000202	U	0.0405	-0.00892	U	0.0563
OB M1	J127M4	6/7/06	0.036	U	0.036	0.751	U	2.0	0.025	U	0.025	0.026	U	0.026	0.063	U	0.063	0.10	U	0.10
OB M2	J127H7	6/5/06	0.42	U	0.42	-1.33	U	2.9	0.045	U	0.045	0.046	U	0.046	0.11	U	0.11	0.15	U	0.15
OB N3	J127K7	6/5/06	0.14	U	0.14	-1.25	U	2.9	0.168		0.029	0.025	U	0.025	0.064	U	0.064	0.079	U	0.079
OB N4	J127K6	6/5/06	0.40	U	0.40	208		2.9	0.042	U	0.042	0.041	U	0.041	0.11	U	0.11	0.15	U	0.15
OB N5	J127K5	6/5/06	0.31	U	0.31	-1.20	U	2.6	0.034	U	0.034	0.038	U	0.038	0.082	U	0.082	0.12	U	0.12
OB N6	J127K4	6/5/06	0.33	U	0.33	0.301	U	2.5	0.033	U	0.033	0.034	U	0.034	0.090	U	0.090	0.11	U	0.11
OB O7	J127K0	6/5/06	0.26	U	0.26	-0.750	U	2.5	0.030	U	0.030	0.033	U	0.033	0.073	U	0.073	0.12	U	0.12
OB O8	J127K1	6/5/06	0.035	U	0.035	-1.32	U	2.5	0.025	U	0.025	0.025	U	0.025	0.061	U	0.061	0.097	U	0.097
OB O9	J127K2	6/5/06	0.28	U	0.28	-1.38	U	2.6	0.033	U	0.033	0.041	U	0.041	0.077	U	0.077	0.13	U	0.13
OB O10	J127K3	6/5/06	0.13	U	0.13	-0.774	U	2.7	0.022	U	0.022	0.023	U	0.023	0.055	U	0.055	0.073	U	0.073
OB P1	J127H5	5/31/06	0.035	U	0.035	-0.087	U	3.6	0.026	U	0.026	0.021	U	0.021	0.053	U	0.053	0.089	U	0.089
OB P2	J127J5	6/1/06	0.38	U	0.38	-0.102	U	2.3	0.041	U	0.041	0.044	U	0.044	0.11	U	0.11	0.14	U	0.14
Duplicate of J127J5	J127J6	6/1/06	0.29	U	0.29	0.144	U	2.1	0.033	U	0.033	0.031	U	0.031	0.069	U	0.069	0.11	U	0.11
Split of J127J5	J127D6	6/1/06				-0.0890	U	0.787	-0.00881	U	0.0179	-0.00568	U	0.0182	0.00488	U	0.0441	0.0146	U	0.0653
OB P3	J127J7	6/1/06	0.031	U	0.031	0.653	U	2.1	0.025	U	0.025	0.022	U	0.022	0.049	U	0.049	0.085	U	0.085
Duplicate of J127J7	J127J8	6/1/06	0.13	U	0.13	0.497	U	2.1	0.022	U	0.022	0.023	U	0.023	0.056	U	0.056	0.074	U	0.074
Split of J127J7	J127D7	6/1/06				0.174	U	0.798	-0.00730	U	0.0199	-0.00566	U	0.0207	-0.0127	U	0.0443	-0.0205	U	0.0691
OB P4	J127J9	6/5/06	0.41	U	0.41	664		2.9	0.045	U	0.045	0.046	U	0.046	0.12	U	0.12	0.14	U	0.14
OB Q5	J127H4	5/31/06	0.14	U	0.14	0.509	U	3.2	0.014	U	0.014	0.014	U	0.014	0.036	U	0.036	0.046	U	0.046
OB Q6	J127H1	5/30/06	0.031	U	0.031	0.381	U	2.6	0.024	U	0.024	0.022	U	0.022	0.050	U	0.050	0.079	U	0.079
OB Q7	J127F2	5/30/06	0.036	U	0.036	0.254	U	2.0	0.025	U	0.025	0.027	U	0.027	0.058	U	0.058	0.093	U	0.093
OB Q8	J127F3	5/30/06	0.11	U	0.11	0.552	U	2.5	0.031	U	0.031	0.030	U	0.030	0.071	U	0.071	0.11	U	0.11
OB R9	J127F6	5/30/06	0.096	U	0.096	0.051	U	2.4	0.030	U	0.030	0.018	U	0.018	0.042	U	0.042	0.054	U	0.054
OB R10	J127F7	5/30/06	0.47	U	0.47	-1.27	U	2.4	0.048	U	0.048	0.052	U	0.052	0.13	U	0.13	0.17	U	0.17

Attachment	1	Sheet No.	6 of 12
Originator	J. M. Capron	Date	11/07/06
Checked	W. S. Thompson <i>[Signature]</i>	Date	11/8/06
Calc. No.	0100B-CA-V0287	Rev. No.	0

Attachment 1. 100-B-14:1 Phase I Verification Sampling Results.

Sample Location	Sample Number	Sample Date	Americium-241			Carbon-14			Cesium-137			Cobalt-60			Europium-152			Europium-154		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB R1	J127F4	5/30/06	0.26	U	0.26	0.587	U	2.7	0.028	U	0.028	0.030	U	0.030	0.067	U	0.067	0.097	U	0.097
OB R2	J127F5	5/30/06	0.033	U	0.033	-1.10	U	2.4	0.024	U	0.024	0.024	U	0.024	0.052	U	0.052	0.086	U	0.086
OB S3	J127F8	5/30/06	0.39	U	0.39	-0.185	U	2.4	0.039	U	0.039	0.042	U	0.042	0.11	U	0.11	0.14	U	0.14
OB S4	J127F9	5/30/06	0.12	U	0.12	-0.310	U	2.4	0.021	U	0.021	0.022	U	0.022	0.052	U	0.052	0.067	U	0.067
OB S5	J127H0	5/30/06	0.091	U	0.091	1.49	U	2.4	0.075	U	0.075	0.14	U	0.14	0.12	U	0.12	0.45	U	0.45
OB S6	J127X6	6/19/06	0.36	U	0.36	0.019	U	2.8	0.079	U	0.079	0.080	U	0.080	0.19	U	0.19	0.28	U	0.28
OB T7	J127X8	6/19/06	0.030	U	0.030	-0.273	U	2.8	0.022	U	0.022	0.030	U	0.030	0.063	U	0.063	0.097	U	0.097
OB T8	J127X5	6/19/06	0.030	U	0.030	-1.19	U	2.7	0.022	U	0.022	0.025	U	0.025	0.060	U	0.060	0.088	U	0.088
OB T9	J127X4	6/19/06	0.37	U	0.37	-1.50	U	2.8	0.083	U	0.083	0.083	U	0.083	0.20	U	0.20	0.30	U	0.30
OB T10	J127X3	6/19/06	0.091	U	0.091	0.637	U	2.9	0.10	U	0.10	0.11	U	0.11	0.16	U	0.16	0.39	U	0.39
OB U1	J127X2	6/19/06	0.15	U	0.15	0.610	U	2.7	0.048	U	0.027	0.024	U	0.024	0.065	U	0.065	0.083	U	0.083
OB U2	J127X1	6/19/06	0.037	U	0.037	-0.112	U	2.7	0.059	U	0.059	0.032	U	0.032	0.074	U	0.074	0.11	U	0.11
OB U3	J127X0	6/19/06	0.013	U	0.013	-0.306	U	2.8	0.040	U	0.040	0.012	U	0.012	0.027	U	0.027	0.039	U	0.039
OB U4	J127W9	6/19/06	0.15	U	0.15	0.215	U	2.8	0.033	U	0.033	0.036	U	0.036	0.079	U	0.079	0.12	U	0.12
OB V5	J127W8	6/19/06	0.036	U	0.036	391	U	3.1	0.028	U	0.028	0.036	U	0.036	0.076	U	0.076	0.10	U	0.10
OB V6	J127W7	6/19/06	0.44	U	0.44	-0.652	U	2.8	0.094	U	0.094	0.099	U	0.099	0.23	U	0.23	0.34	U	0.34
OB V7	J127W6	6/19/06	0.16	U	0.16	0.186	U	3.4	0.030	U	0.030	0.032	U	0.032	0.074	U	0.074	0.10	U	0.10
OB V8	J127W5	6/19/06	0.49	U	0.49	-0.921	U	3.1	0.050	U	0.050	0.054	U	0.054	0.13	U	0.13	0.16	U	0.16

Sample Location	Sample Number	Sample Date	Europium-155			Potassium-40			Radium-226			Radium-228			Thorium-228			Thorium-232		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB A1	J127W4	6/19/06	0.13	U	0.13	14.0	U	0.41	0.933	U	0.085	1.07	U	0.19	1.01	U	0.054	1.07	U	0.19
OB A2	J127W3	6/19/06	0.12	U	0.12	17.1	U	0.40	0.942	U	0.066	1.25	U	0.15	1.16	U	0.040	1.25	U	0.15
OB A3	J127W1	6/19/06	0.19	U	0.19	26.1	U	0.47	1.06	U	0.083	1.43	U	0.19	1.38	U	0.064	1.43	U	0.19
OB A4	J127W2	6/19/06	0.26	U	0.26	36.0	U	0.93	1.37	U	0.20	2.05	U	0.52	2.02	U	0.16	2.05	U	0.52
OB B5	J127W0	6/14/06	0.11	U	0.11	12.0	U	0.40	0.429	U	0.073	0.740	U	0.16	0.824	U	0.068	0.740	U	0.16
OB B6	J127V9	6/14/06	0.12	U	0.12	10.8	U	1.3	0.736	U	0.20	0.618	U	0.59	0.312	U	0.095	0.618	U	0.59
OB B7	J127V8	6/14/06	0.18	U	0.18	23.8	U	0.51	0.902	U	0.086	1.36	U	0.22	1.28	U	0.063	1.36	U	0.22
OB B8	J127V7	6/14/06	0.11	U	0.11	14.0	U	0.27	0.586	U	0.052	0.842	U	0.12	0.757	U	0.032	0.842	U	0.12
OB C9	J127V3	6/14/06	0.11	U	0.11	11.6	U	0.31	0.466	U	0.061	0.738	U	0.18	0.754	U	0.066	0.738	U	0.18
OB C10	J127V4	6/14/06	0.12	U	0.12	13.8	U	0.31	0.562	U	0.062	0.887	U	0.13	0.699	U	0.038	0.887	U	0.13
OB C1	J127V5	6/14/06	0.16	U	0.16	21.8	U	0.48	0.786	U	0.081	1.27	U	0.18	1.21	U	0.056	1.27	U	0.18
OB C2	J127V6	6/14/06	0.082	U	0.082	12.8	U	0.22	0.509	U	0.040	0.747	U	0.099	0.614	U	0.027	0.747	U	0.099
OB D3	J127V2	6/13/06	0.056	U	0.056	14.0	U	0.11	0.601	U	0.020	0.910	U	0.046	0.736	U	0.012	0.910	U	0.046
OB D4	J127X7	6/19/06	0.18	U	0.18	22.4	U	0.49	1.40	U	0.096	1.71	U	0.18	1.60	U	0.068	1.71	U	0.18
OB D5	J127T6	6/12/06	0.056	U	0.056	12.2	U	0.25	0.480	U	0.042	0.761	U	0.11	0.604	U	0.025	0.761	U	0.11
OB D6	J127T5	6/12/06	0.19	U	0.19	25.0	U	0.51	1.01	U	0.10	1.52	U	0.23	1.32	U	0.072	1.52	U	0.23
OB E7	J127T8	6/13/06	0.11	U	0.11	10.5	U	0.35	0.485	U	0.063	0.708	U	0.14	0.577	U	0.038	0.708	U	0.14
OB E8	J127T9	6/13/06	0.084	U	0.084	11.5	U	0.28	0.562	U	0.044	0.665	U	0.11	0.623	U	0.029	0.665	U	0.11
OB E9	J127V0	6/13/06	0.076	U	0.076	20.5	U	0.17	0.874	U	0.032	1.22	U	0.062	1.14	U	0.023	1.22	U	0.062
OB E10	J127V1	6/13/06	0.046	U	0.046	11.3	U	0.16	0.478	U	0.029	0.589	U	0.061	0.588	U	0.016	0.589	U	0.061
OB F1	J127T4	6/12/06	0.055	U	0.055	11.8	U	0.25	0.495	U	0.046	0.701	U	0.10	0.067	U	0.067	0.701	U	0.10

Attachment I Sheet No. 7 of 12
 Originator J. M. Capron Date 11/07/06
 Checked W. S. Thompson Date 11/8/06
 Calc. No. 0100B-CA-V0287 Rev. No. 0

Attachment 1. 100-B-14:1 Phase I Verification Sampling Results.

Sample Location	Sample Number	Sample Date	Europium-155			Potassium-40			Radium-226			Radium-228			Thorium-228			Thorium-232		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB F2	J127T3	6/12/06	0.11	U	0.11	11.0		0.29	0.460		0.062	0.636		0.11	0.686		0.063	0.636		0.11
OB F3	J127T2	6/12/06	0.15	U	0.15	21.1		0.35	0.842		0.071	1.13		0.15	1.15		0.052	1.13		0.15
OB F4	J127T1	6/12/06	0.17	U	0.17	21.4		0.33	0.877		0.079	1.20		0.16	1.13		0.054	1.20		0.16
OB G5	J127T0	6/12/06	0.071	U	0.071	11.7		0.20	0.465		0.038	0.711		0.096	0.586		0.023	0.711		0.096
OB G6	J127R9	6/12/06	0.053	U	0.053	13.6		0.25	0.473		0.036	0.622		0.11	0.634		0.028	0.622		0.11
OB G7	J127R8	6/12/06	0.092	U	0.092	10.2		0.26	0.462		0.052	0.580		0.11	0.548		0.032	0.580		0.11
OB G8	J127R7	6/12/06	0.080	U	0.080	11.4		0.23	0.452		0.040	0.667		0.093	0.563		0.026	0.667		0.093
OB H9	J127R6	6/12/06	0.16	U	0.16	21.6		0.38	0.873		0.084	1.31		0.17	1.18		0.059	1.31		0.17
OB H10	J127R5	6/12/06	0.15	U	0.15	20.9		0.36	0.819		0.079	1.15		0.17	1.15		0.052	1.15		0.17
OB H1	J127R4	6/12/06	0.12	U	0.12	11.3		0.21	0.510		0.043	0.657		0.12	0.591		0.028	0.657		0.12
OB H2	J127R3	6/12/06	0.053	U	0.053	13.1		0.24	0.551		0.049	0.784		0.099	0.839		0.044	0.784		0.099
OB I3	J127P1	6/8/06	0.079	U	0.079	11.2		0.20	0.490		0.048	0.615		0.096	0.564		0.029	0.615		0.096
OB I4	J127P2	6/8/06	0.053	U	0.053	12.3		0.19	0.495		0.043	0.707		0.11	0.626		0.028	0.707		0.11
OB I5	J127P3	6/8/06	0.077	U	0.077	10.8		0.24	0.452		0.047	0.646		0.094	0.551		0.028	0.646		0.094
OB I6	J127R2	6/12/06	0.11	U	0.11	10.9		0.38	0.404		0.070	0.744		0.15	0.574		0.043	0.744		0.15
OB J7	J127P0	6/8/06	0.087	U	0.087	11.8		0.28	0.480		0.045	0.625		0.11	0.735		0.041	0.625		0.11
OB J8	J127N9	6/8/06	0.15	U	0.15	20.0		0.37	0.806		0.065	1.17		0.18	1.04		0.054	1.17		0.18
OB J9	J127N8	6/7/06	0.079	U	0.079	11.8		0.26	0.410		0.044	0.674		0.086	0.592		0.028	0.674		0.086
OB J10	J127N7	6/7/06	0.048	U	0.048	1.1	U	1.1	0.532		0.039	0.784		0.10	0.779		0.038	0.784		0.10
OB K1	J127N4	6/7/06	0.16	U	0.16	22.4		0.41	0.961		0.087	1.23		0.18	1.21		0.057	1.23		0.18
OB K2	J127N5	6/7/06	0.15	U	0.15	22.5		0.39	0.974		0.070	1.36		0.16	1.30		0.056	1.36		0.16
OB K3	J127N6	6/7/06	0.11	U	0.11	12.1		0.37	0.514		0.059	0.716		0.13	0.673		0.035	0.716		0.13
OB K4	J127T7	6/12/06	0.062	U	0.062	13.1		0.30	0.626		0.050	0.910		0.12	0.722		0.032	0.910		0.12
OB L5	J127N2	6/7/06	0.068	U	0.068	13.2		0.29	0.660		0.058	0.900		0.12	0.784		0.035	0.900		0.12
Duplicate of J127N2	J127N3	6/7/06	0.084	U	0.084	11.8		0.26	0.596		0.048	0.888		0.11	0.665		0.028	0.888		0.11
Split of J127N2	J127F1	6/7/06	0.0527	U	0.0457															
OB L6	J127M8	6/7/06	0.060	U	0.060	13.7		0.33	0.632		0.057	0.853		0.13	0.785		0.035	0.853		0.13
Duplicate of J127M8	J127M9	6/7/06	0.087	U	0.087	13.6		0.27	0.549		0.044	0.792		0.12	0.640		0.030	0.792		0.12
Split of J127M9	J127D9	6/7/06	0.0631	U	0.0486															
OB L7	J127N0	6/7/06	0.17	U	0.17	23.9		0.48	0.964		0.087	1.42		0.19	1.34		0.062	1.42		0.19
OB L8	J127N1	6/7/06	0.12	U	0.12	11.9		0.42	0.520		0.069	0.679		0.18	0.655		0.042	0.679		0.18
OB M9	J127M7	6/7/06	0.18	U	0.18	12.2		0.32	0.468		0.066	0.721		0.15	0.626		0.046	0.721		0.15
OB M10	J127M5	6/7/06	0.093	U	0.093	13.8		0.31	0.512		0.051	0.798		0.11	0.707		0.030	0.798		0.11
Duplicate of J127M5	J127M6	6/7/06	0.17	U	0.17	24.2		0.41	1.03		0.088	1.43		0.18	1.26		0.063	1.43		0.18
Split of J127M5	J127D8	6/7/06	0.0466	U	0.0503															
OB M1	J127M4	6/7/06	0.061		0.058	14.7		0.20	0.555		0.057	0.20	U	0.20	0.728		0.032	0.20	U	0.20
OB M2	J127H7	6/5/06	0.17	U	0.17	22.5		0.48	0.773		0.084	1.25		0.18	1.16		0.059	1.25		0.18
OB N3	J127K7	6/5/06	0.10	U	0.10	12.3		0.29	0.495		0.053	0.780		0.099	0.630		0.030	0.780		0.099
OB N4	J127K6	6/5/06	0.16	U	0.16	22.8		0.42	0.873		0.083	1.35		0.17	1.27		0.056	1.35		0.17
OB N5	J127K5	6/5/06	0.12	U	0.12	13.1		0.38	0.518		0.074	0.871		0.17	0.885		0.069	0.871		0.17
OB N6	J127K4	6/5/06	0.12	U	0.12	14.1		0.35	0.509		0.073	0.852		0.15	0.786		0.046	0.852		0.15
OB O7	J127K0	6/5/06	0.10	U	0.10	11.3		0.41	0.454		0.061	0.606		0.14	0.788		0.060	0.606		0.14

Attachment 1
 Originator J. M. Capron
 Checked W. S. Thompson
 Calc. No. 0100B-CA-V0287
 Sheet No. 8 of 12
 Date 11/07/06
 Date 11/18/06
 Rev. No. 0

Attachment 1. 100-B-14:1 Phase I Verification Sampling Results.

Sample Location	Sample Number	Sample Date	Europium-155			Potassium-40			Radium-226			Radium-228			Thorium-228			Thorium-232		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB O8	J127K1	6/5/06	0.051	U	0.051	12.2		0.28	0.524		0.052	0.733		0.11	0.861		0.043	0.733		0.11
OB O9	J127K2	6/5/06	0.11	U	0.11	11.6		0.32	0.465		0.066	0.666		0.14	0.737		0.068	0.666		0.14
OB O10	J127K3	6/5/06	0.077	U	0.077	11.7		0.24	0.480		0.045	0.773		0.11	0.605		0.028	0.773		0.11
OB P1	J127H5	5/31/06	0.053	U	0.053	10.1		0.42	0.431		0.048	0.658		0.14	0.620		0.032	0.658		0.14
OB P2	J127J5	6/1/06	0.14	U	0.14	22.8		0.37	0.890		0.080	1.22		0.16	1.23		0.057	1.22		0.16
Duplicate of J127J5	J127J6	6/1/06	0.11	U	0.11	12.3		0.35	0.524		0.060	0.767		0.15	0.679		0.039	0.767		0.15
Split of J127J5	J127D6	6/1/06	0.0313	U	0.0464															
OB P3	J127J7	6/1/06	0.047	U	0.047	12.9		0.28	0.505		0.050	0.786		0.11	0.682		0.027	0.786		0.11
Duplicate of J127J7	J127J8	6/1/06	0.079	U	0.079	11.8		0.23	0.462		0.041	0.737		0.10	0.582		0.028	0.737		0.10
Split of J127J7	J127D7	6/1/06	0.0510	U	0.0487															
OB P4	J127J9	6/5/06	0.16	U	0.16	23.8		0.38	0.880		0.079	1.43		0.17	1.24		0.059	1.43		0.17
OB Q5	J127H4	5/31/06	0.072	U	0.072	20.3		0.14	0.718		0.027	1.15		0.060	1.04		0.019	1.15		0.060
OB Q6	J127H1	5/30/06	0.048	U	0.048	11.4		0.22	0.454		0.043	0.728		0.11	0.724		0.040	0.728		0.11
OB Q7	J127F2	5/30/06	0.058	U	0.058	13.1		0.27	0.500		0.051	0.785		0.11	0.845		0.049	0.785		0.11
OB Q8	J127F3	5/30/06	0.083	U	0.083	12.2		0.34	0.458		0.067	0.649		0.13	0.622		0.035	0.649		0.13
OB R9	J127F6	5/30/06	0.058	U	0.058	11.2		0.18	0.424		0.033	0.652		0.070	0.549		0.021	0.652		0.070
OB R10	J127F7	5/30/06	0.17	U	0.17	23.5		0.57	0.977		0.11	1.20		0.22	1.28		0.069	1.20		0.22
OB R1	J127F4	5/30/06	0.094	U	0.094	13.3		0.25	0.547		0.054	0.710		0.12	0.891		0.052	0.710		0.12
OB R2	J127F5	5/30/06	0.049	U	0.049	15.6		0.25	0.572		0.045	0.891		0.11	0.796		0.027	0.891		0.11
OB S3	J127F8	5/30/06	0.14	U	0.14	22.1		0.41	0.886		0.085	1.47		0.17	1.26		0.055	1.47		0.17
OB S4	J127F9	5/30/06	0.070	U	0.070	10.6		0.22	0.427		0.045	0.653		0.087	0.516		0.027	0.653		0.087
OB S5	J127H0	5/30/06	0.091	U	0.091	7.69		1.5	0.249		0.16	0.935		0.44	0.283		0.068	0.935		0.44
OB S6	J127X6	6/19/06	0.21	U	0.21	29.4		0.86	1.08		0.16	1.69		0.42	1.69		0.13	1.69		0.42
OB T7	J127X8	6/19/06	0.060	U	0.060	13.8		0.29	0.528		0.050	0.697		0.12	0.709		0.027	0.697		0.12
OB T8	J127X5	6/19/06	0.059	U	0.059	13.9		0.24	0.550		0.042	0.668		0.11	0.686		0.030	0.668		0.11
OB T9	J127X4	6/19/06	0.22	U	0.22	31.6		0.90	1.20		0.15	1.85		0.33	1.76		0.14	1.85		0.33
OB T10	J127X3	6/19/06	0.099	U	0.099	11.1		1.3	0.505		0.18	0.62	U	0.62	0.394		0.071	0.62	U	0.62
OB U1	J127X2	6/19/06	0.090	U	0.090	14.1		0.28	0.642		0.050	0.906		0.11	0.722		0.033	0.906		0.11
OB U2	J127X1	6/19/06	0.083	U	0.083	16.4		0.31	0.642		0.061	0.990		0.13	0.810		0.033	0.990		0.13
OB U3	J127X0	6/19/06	0.049	U	0.049	17.4		0.11	0.747		0.020	1.06		0.046	0.958		0.013	1.06		0.046
OB U4	J127W9	6/19/06	0.077	U	0.081	39.4		0.40	1.39		0.069	2.27		0.15	2.34		0.055	2.27		0.15
OB V5	J127W8	6/19/06	0.11	U	0.11	16.9		0.29	0.737		0.053	1.05		0.13	0.951		0.034	1.05		0.13
OB V6	J127W7	6/19/06	0.26	U	0.26	34.1		1.0	1.36		0.15	2.29		0.46	2.11		0.15	2.29		0.46
OB V7	J127W6	6/19/06	0.10	U	0.10	15.9		0.33	0.724		0.058	1.06		0.13	0.880		0.036	1.06		0.13
OB V8	J127W5	6/19/06	0.19	U	0.19	28.3		0.47	1.38		0.091	1.92		0.20	1.73		0.070	1.92		0.20

Attachment 1
 Originator J. M. Capron
 Checked W. S. Thompson
 Calc. No. 0100B-CA-V0287
 Sheet No. 9 of 12
 Date 11/07/06
 Date 11/8/07
 Rev. No. 0

Attachment 1. 100-B-14:1 Phase I Verification Sampling Results.

Sample Location	Sample Number	Sample Date	Tritium			Uranium-235			Uranium-238			Hexavalent Chromium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB A1	J127W4	6/19/06				0.17	U	0.17	5.3	U	5.3	0.34		0.20
OB A2	J127W3	6/19/06				0.11	U	0.11	4.0	U	4.0	0.27		0.20
OB A3	J127W1	6/19/06				0.22	U	0.22	5.3	U	5.3	0.20	U	0.20
OB A4	J127W2	6/19/06				0.37	U	0.37	13	U	13	0.20	U	0.20
OB B5	J127W0	6/14/06				0.15	U	0.15	4.5	U	4.5	0.35		0.21
OB B6	J127V9	6/14/06				0.19	U	0.19	19	U	19	0.26		0.21
OB B7	J127V8	6/14/06				0.22	U	0.22	5.6	U	5.6	0.36		0.21
OB B8	J127V7	6/14/06				0.095	U	0.095	3.1	U	3.1	0.25		0.21
OB C9	J127V3	6/14/06				0.16	U	0.16	4.6	U	4.6	0.26		0.22
OB C10	J127V4	6/14/06				0.13	U	0.13	3.7	U	3.7	0.40		0.21
OB C1	J127V5	6/14/06				0.20	U	0.20	5.2	U	5.2	0.21	U	0.21
OB C2	J127V6	6/14/06				0.11	U	0.11	2.8	U	2.8	0.21	U	0.21
OB D3	J127V2	6/13/06				0.057	U	0.057	1.7	U	1.7	0.21	U	0.21
OB D4	J127X7	6/19/06				0.21	U	0.21	5.6	U	5.6	2.0	UD	2.0
OB D5	J127T6	6/12/06				0.081	U	0.081	2.9	U	2.9	0.20	U	0.20
OB D6	J127T5	6/12/06				0.24	U	0.24	6.2	U	6.2	0.28		0.20
OB E7	J127T8	6/13/06				0.15	U	0.15	4.2	U	4.2	0.27		0.21
OB E8	J127T9	6/13/06				0.11	U	0.11	3.1	U	3.1	0.32		0.21
OB E9	J127V0	6/13/06				0.090	U	0.090	3.3	U	3.3	0.21	U	0.21
OB E10	J127V1	6/13/06				0.064	U	0.064	1.8	U	1.8	0.24		0.21
OB F1	J127T4	6/12/06				0.079	U	0.079	2.9	U	2.9	0.21		0.20
OB F2	J127T3	6/12/06				0.15	U	0.15	3.9	U	3.9	0.29		0.20
OB F3	J127T2	6/12/06				0.18	U	0.18	4.4	U	4.4	0.26		0.20
OB F4	J127T1	6/12/06				0.18	U	0.18	4.5	U	4.5	0.25		0.20
OB G5	J127T0	6/12/06				0.093	U	0.093	2.4	U	2.4	0.20	U	0.20
OB G6	J127R9	6/12/06				0.076	U	0.076	2.7	U	2.7	0.30		0.20
OB G7	J127R8	6/12/06				0.13	U	0.13	3.5	U	3.5	0.23		0.20
OB G8	J127R7	6/12/06				0.10	U	0.10	2.7	U	2.7	0.27		0.20
OB H9	J127R6	6/12/06				0.20	U	0.20	5.1	U	5.1	0.22		0.20
OB H10	J127R5	6/12/06				0.19	U	0.19	4.9	U	4.9	0.20	U	0.20
OB H1	J127R4	6/12/06				0.10	U	0.10	2.5	U	2.5	0.20	U	0.20
OB H2	J127R3	6/12/06				0.094	U	0.094	3.1	U	3.1	0.24		0.20
OB I3	J127P1	6/8/06				0.10	U	0.10	2.7	U	2.7	0.20	U	0.20
OB I4	J127P2	6/8/06				0.092	U	0.092	3.1	U	3.1	0.21	U	0.21
OB I5	J127P3	6/8/06				0.097	U	0.097	2.5	U	2.5	0.31		0.21
OB I6	J127R2	6/12/06				0.16	U	0.16	4.7	U	4.7	0.28		0.20
OB J7	J127P0	6/8/06				0.090	U	0.090	2.9	U	2.9	0.29		0.20
OB J8	J127N9	6/8/06				0.19	U	0.19	4.4	U	4.4	0.26		0.20
OB J9	J127N8	6/7/06				0.10	U	0.10	2.8	U	2.8	0.27		0.20
OB J10	J127N7	6/7/06				0.089	U	0.089	2.7	U	2.7	0.35		0.20

Attachment 1
 Originator J. M. Capron
 Checked W. S. Thompson
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Attachment 1. 100-B-14:1 Phase I Verification Sampling Results.

Sample Location	Sample Number	Sample Date	Tritium			Uranium-235			Uranium-238			Hexavalent Chromium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB K1	J127N4	6/7/06				0.18	U	0.18	5.3	U	5.3	0.75		0.20
OB K2	J127N5	6/7/06				0.18	U	0.18	5.1	U	5.1	0.61		0.20
OB K3	J127N6	6/7/06				0.15	U	0.15	3.7	U	3.7	0.60		0.20
OB K4	J127T7	6/12/06				0.091	U	0.091	3.5	U	3.5	0.24		0.20
OB L5	J127N2	6/7/06				0.11	U	0.11	3.5	U	3.5	0.75		0.21
Duplicate of J127N2	J127N3	6/7/06				0.11	U	0.11	2.8	U	2.8	0.72		0.21
Split of J127N2	J127F1	6/7/06										0.350	U	0.350
OB L6	J127M8	6/7/06				0.11	U	0.11	3.7	U	3.7	0.23		0.21
Duplicate of J127M8	J127M9	6/7/06				0.17	U	0.17	4.6	U	4.6	0.36		0.21
Split of J127M9	J127D9	6/7/06										0.350	U	0.350
OB L7	J127N0	6/7/06				0.20	U	0.20	5.6	U	5.6	0.75		0.41
OB L8	J127N1	6/7/06				0.16	U	0.16	4.7	U	4.7	0.28		0.20
OB M9	J127M7	6/7/06				0.16	U	0.16	4.7	U	4.7	0.21	U	0.21
OB M10	J127M5	6/7/06				0.12	U	0.12	3.2	U	3.2	0.22		0.21
Duplicate of J127M5	J127M6	6/7/06				0.20	U	0.20	5.7	U	5.7	0.29		0.21
Split of J127M5	J127D8	6/7/06										0.350	U	0.350
OB M1	J127M4	6/7/06				0.099	U	0.099	3.2	U	3.2	0.28		0.21
OB M2	J127H7	6/5/06				0.18	U	0.18	5.3	U	5.3	0.21	U	0.21
OB N3	J127K7	6/5/06				0.11	U	0.11	2.8	U	2.8	0.27		0.21
OB N4	J127K6	6/5/06				0.18	U	0.18	5.5	U	5.5	0.39		0.21
OB N5	J127K5	6/5/06				0.16	U	0.16	4.3	U	4.3	0.32		0.21
OB N6	J127K4	6/5/06				0.14	U	0.14	4.0	U	4.0	0.21	U	0.21
OB O7	J127K0	6/5/06				0.14	U	0.14	4.0	U	4.0	0.32		0.21
OB O8	J127K1	6/5/06				0.096	U	0.096	3.4	U	3.4	0.22	U	0.22
OB O9	J127K2	6/5/06				0.15	U	0.15	4.4	U	4.4	0.21	U	0.21
OB O10	J127K3	6/5/06				0.11	U	0.11	2.5	U	2.5	0.28		0.21
OB P1	J127H5	5/31/06	-0.514	UJ	3.1	0.094	U	0.094	2.9	U	2.9	0.31		0.20
OB P2	J127J5	6/1/06				0.17	U	0.17	5.3	U	5.3	0.20	U	0.20
Duplicate of J127J5	J127J6	6/1/06				0.14	U	0.14	4.0	U	4.0	0.21	U	0.21
Split of J127J5	J127D6	6/1/06										0.350	U	0.350
OB P3	J127J7	6/1/06				0.087	U	0.087	3.7	U	3.7	0.22		0.20
Duplicate of J127J7	J127J8	6/1/06				0.10	U	0.10	2.7	U	2.7	0.24		0.20
Split of J127J7	J127D7	6/1/06										0.350	U	0.350
OB P4	J127J9	6/5/06				0.18	U	0.18	5.3	U	5.3	0.22	U	0.22
OB Q5	J127H4	5/31/06	-0.049	UJ	2.5	0.062	U	0.062	2.3	U	2.3	0.33		0.20
OB Q6	J127H1	5/30/06	0.428	U	2.4	0.085	U	0.085	2.3	U	2.3	0.20	U	0.20
OB Q7	J127F2	5/30/06	-0.568	U	2.3	0.10	U	0.10	3.1	U	3.1	0.20	U	0.20
OB Q8	J127F3	5/30/06	-0.034	U	2.3	0.12	U	0.12	3.6	U	3.6	0.21	U	0.21
OB R9	J127F6	5/30/06	0.702	U	2.2	0.076	U	0.076	1.9	U	1.9	0.20	U	0.20
OB R10	J127F7	5/30/06	-0.485	U	2.2	0.21	U	0.21	6.6	U	6.6	0.20	U	0.20

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 Originator J. M. Capron
 Checked W. S. Thompson
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 Rev. No. 0

Attachment 1. 100-B-14:1 Phase I Verification Sampling Results.

Sample Location	Sample Number	Sample Date	Tritium			Uranium-235			Uranium-238			Hexavalent Chromium		
			pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA	pCi/g	Q	MDA
OB R1	J127F4	5/30/06	-0.184	U	2.4	0.13	U	0.13	3.6	U	3.6	0.20	U	0.20
OB R2	J127F5	5/30/06	0.029	U	2.2	0.087	U	0.087	2.8	U	2.8	0.20	U	0.20
OB S3	J127F8	5/30/06	0.385	U	2.2	0.17	U	0.17	7.5	U	7.5	0.20	U	0.20
OB S4	J127F9	5/30/06	0.061	U	2.3	0.092	U	0.092	2.4	U	2.4	0.20	U	0.20
OB S5	J127H0	5/30/06	0.426	U	2.3	0.14	U	0.14	13	U	13	0.20	U	0.20
OB S6	J127X6	6/19/06				0.30	U	0.30	10	U	10	0.34		0.20
OB T7	J127X8	6/19/06				0.086	U	0.086	3.1	U	3.1	0.23		0.20
OB T8	J127X5	6/19/06				0.085	U	0.085	2.9	U	2.9	0.28		0.20
OB T9	J127X4	6/19/06				0.31	U	0.31	11	U	11	0.24		0.20
OB T10	J127X3	6/19/06				0.15	U	0.15	15	U	15	0.20	U	0.20
OB U1	J127X2	6/19/06				0.11	U	0.11	3.2	U	3.2	0.20	U	0.20
OB U2	J127X1	6/19/06				0.10	U	0.10	3.7	U	3.7	0.24		0.20
OB U3	J127X0	6/19/06				0.092	U	0.092	1.3	U	1.3	0.27		0.20
OB U4	J127W9	6/19/06				0.19	U	0.19	4.2	U	4.2	0.22		0.20
OB V5	J127W8	6/19/06				0.10	U	0.10	3.8	U	3.8	0.20	U	0.20
OB V6	J127W7	6/19/06				0.38	U	0.38	12	U	12	0.20	U	0.20
OB V7	J127W6	6/19/06				0.13	U	0.13	3.7	U	3.7	0.20	U	0.20
OB V8	J127W5	6/19/06				0.25	U	0.25	6.1	U	6.1	0.20	U	0.20

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Originator	J. M. Capron	Date	11/07/06
Checked	W. S. Thompson <i>WST</i>	Date	11/8/06
Calc. No.	0100B-CA-V0287	Rev. No.	0

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Attachment X. 100-B-14:1 Phase II Verification Sampling Results.

Sample Location	Sample Number	Sample Date	Hexavalent Chromium		
			mg/kg	Q	PQL
SZ C10	J13HF3	9/28/06	0.36		0.20

Sample Location	Sample Number	Sample Date	Carbon-14		
			pCi/g	Q	MDA
SZ G7	J13HF4	9/29/06	0.082	U	3.0
SZ H2	J13HF5	9/29/06	-0.426	U	2.8

Sample Location	Sample Number	Sample Date	Carbon-14		
			pCi/g	Q	MDA
OB01 A1	J13FW9	9/21/06	0.632	U	2.1
Duplicate of J13FW9	J13FX0	9/21/06	275		2.4
Split of J13FW9	J13HD8	9/21/06	-0.0788	U	0.839
OB01 A2	J13FX1	9/21/06	-1.24	U	2.3
OB01 A3	J13FX2	9/21/06	-0.864	U	2.0
OB01 A4	J13HD4	9/28/06	-1.49	U	2.9
OB01 B5	J13HD5	9/28/06	2.19	U	2.6
OB01 B6	J13FX3	9/21/06	-1.01	U	2.3
OB01 B7	J13FX4	9/21/06	-1.63	U	2.1
OB01 B8	J13FX5	9/21/06	-0.767	U	2.2
OB01 C9	J13FX6	9/21/06	-1.21	U	2.3
OB01 C10	J13FX7	9/21/06	-0.975	U	2.1
OB01 C1	J13FX8	9/21/06	-0.962	U	2.1
OB01 C2	J13FX9	9/21/06	0.597	U	2.3
Duplicate of J13FX9	J13FY0	9/21/06	-1.68	U	2.2
Split of J13FX9	J13HD9	9/21/06	0.189	U	0.838

Sample Location	Sample Number	Sample Date	Carbon-14		
			pCi/g	Q	MDA
OB02 A1	J13FR2	9/19/06	-0.878	U	3.0
OB02 A2	J13FR3	9/19/06	-1.32	U	2.9
OB02 A3	J13FR4	9/19/06	-0.148	U	2.7
OB02 A4	J13FR5	9/19/06	-1.02	U	3.1
OB02 B5	J13FR6	9/19/06	0.258	U	2.7
OB02 B6	J13FR7	9/19/06	-0.672	U	2.6
OB02 B7	J13FR8	9/19/06	0.199	U	2.9
OB02 B8	J13FR9	9/19/06	-0.439	U	2.9

Sample Location	Sample Number	Sample Date	Carbon-14		
			pCi/g	Q	MDA
OB03 A1	J13FT4	9/20/06	-0.944	U	2.9
OB03 A2	J13FT5	9/20/06	0.969	U	2.7
OB03 A3	J13FT6	9/20/06	0.461	U	3.2
OB03 A4	J13FT7	9/20/06	-0.076	U	2.8
OB03 B5	J13FT0	9/20/06	-0.477	U	3.0
OB03 B6	J13FT1	9/20/06	-1.40	U	2.9
OB03 B7	J13FT2	9/20/06	-0.281	U	3.1
OB03 B8	J13FT3	9/20/06	0.042	U	3.0
OB03 C9	J13FT8	9/20/06	-0.137	U	2.8
OB03 C10	J13FT9	9/20/06	-0.463	U	2.7
OB03 C1	J13FV0	9/20/06	-0.773	U	2.2
OB03 C2	J13FV1	9/20/06	0	U	2.4
OB03 D3	J13FV2	9/20/06	0.174	U	1.9
OB03 D4	J13FV3	9/20/06	0.334	U	2.3
OB03 D5	J13FV4	9/20/06	-0.738	U	2.0
OB03 D6	J13FV5	9/20/06	0.054	U	2.0
OB03 E7	J13FW0	9/20/06	-0.347	U	2.4
OB03 E8	J13FW1	9/20/06	-0.676	U	2.1
OB03 E9	J13FW2	9/20/06	-0.038	U	2.1
OB03 E10	J13FW3	9/20/06	2.32	U	2.4
OB03 F1	J13FV6	9/20/06	0.562	U	1.9
OB03 F2	J13FV7	9/20/06	-0.781	U	2.1
OB03 F3	J13FV8	9/20/06	-0.576	U	2.1
OB03 F4	J13FV9	9/20/06	-0.123	U	2.2

Sample Location	Sample Number	Sample Date	Carbon-14		
			pCi/g	Q	MDA
OB03 G5	J13FW4	9/20/06	0.098	U	2.1
OB03 G6	J13FW5	9/20/06	-0.125	U	2.3
OB03 G7	J13FW6	9/20/06	0.607	U	2.0
OB03 G8	J13FW7	9/20/06	0.326	U	2.1

Sample Location	Sample Number	Sample Date	Carbon-14		
			pCi/g	Q	MDA
OB04 A1	J13FY1	9/22/06	-1.03	U	2.1
Duplicate of J13FY1	J13FY2	9/22/06	-0.888	U	2.7
Split of J13FY1	J13HF0	9/22/06	0.184	U	0.841
OB04 A2	J13FY3	9/22/06	-0.036	U	2.5
OB04 A3	J13FY4	9/22/06	-0.577	U	2.7
OB04 A4	J13FY5	9/22/06	0.192	U	2.7
OB04 B5	J13FY6	9/22/06	0.219	U	2.8
OB04 B6	J13FY7	9/22/06	0.689	U	2.6
OB04 B7	J13FY8	9/22/06	1.01	U	2.6
OB04 B8	J13FY9	9/22/06	0.786	U	2.5
OB04 C9	J13H27	9/26/06	-0.708	U	2.6
OB04 C10	J13H28	9/26/06	0.576	U	2.7
OB04 C1	J13H11	9/26/06	0.187	U	2.9
OB04 C2	J13H26	9/26/06	0.900	U	2.8

Sample Location	Sample Number	Sample Date	Carbon-14		
			pCi/g	Q	MDA
OB05 A1	J13H05	9/25/06	0.396	U	2.2
Duplicate of J13H05	J13H09	9/25/06	-0.472	U	2.2
Split of J13H05	J13HF2	9/25/06	1.55		0.850
OB05 A2	J13H06	9/25/06	-0.073	U	2.0
OB05 A3	J13H07	9/25/06	0.088	U	1.9
OB05 A4	J13H08	9/25/06	-0.823	U	2.0
OB05 B5	J13H10	9/25/06	-0.296	U	2.3
OB05 B6	J13H29	9/26/06	1.72	U	2.6
OB05 B7	J13H12	9/25/06	0.200	U	2.0
OB05 B8	J13H13	9/25/06	-0.112	U	2.0
OB05 C9	J13HD6	9/28/06	-0.078	U	2.8
OB05 C10	J13HD7	9/28/06	0.840	U	2.8
OB05 C1	J13H14	9/25/06	0.755	U	2.1
OB05 C2	J13H15	9/25/06	-1.18	U	2.1
OB05 D3	J13H16	9/25/06	0.521	U	2.0
OB05 D4	J13H17	9/25/06	1.39	U	2.1
OB05 D5	J13H18	9/25/06	0.238	U	2.2
OB05 D6	J13H19	9/25/06	0.578	U	1.9
OB05 E7	J13HD2	9/26/06	0.483	U	2.8
OB05 E8	J13HD3	9/26/06	0.580	U	2.7
OB05 E9	J13H20	9/25/06	-0.303	U	2.4
OB05 E10	J13H21	9/25/06	-0.367	U	2.0

Sample Location	Sample Number	Sample Date	Carbon-14		
			pCi/g	Q	MDA
OB06 A1	J13H00	9/22/06	1.00	U	2.8
OB06 A2	J13H01	9/22/06	0.338	U	2.4
OB06 A3	J13H02	9/22/06	0.871	U	2.6
OB06 A4	J13H03	9/22/06	-0.567	U	2.6
Duplicate of J13H03	J13H04	9/22/06	0.132	U	2.7
Split of J13H03	J13HF1	9/22/06	-0.0637	U	0.839
OB06 B5	J13H22	9/25/06	-0.143	U	2.0
OB06 B6	J13H23	9/25/06	-0.282	U	2.2
OB06 B7	J13H24	9/25/06	-0.477	U	2.0
OB06 B8	J13H25	9/25/06	0.139	U	1.9

Sample Location	Sample Number	Sample Date	Carbon-14		
			pCi/g	Q	MDA
Equipment blank	J13FW8	9/21/06	-0.354	U	2.1

Attachment
Originator
Checked
Calc. No.

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J. M. Capron *JMC*
W. S. Thompson *WST*
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Date 11/07/06
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