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Site Completion Report for Area CPP-67, WAG 3, OU 3-13, Group 3, Other Surface Soils

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Idaho Cleanup Project

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July 2005

Prepared for the
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DOE-NE Idaho Operations Office

ABSTRACT

The purpose of this Site Completion Report is to document the work performed, discuss modifications to the remedial action, and document the project's completion and final certification status.

Release Site CPP-67 is one of several soil contamination sites at the Idaho National Laboratory Site's Idaho Nuclear Technology and Engineering Center (INTEC) facility and has been remediated as part of Phase I of the Operable Unit (OU) 3-13, Group 3, Other Surface Soils, remediation project. The completed remedial action activities described in this report were conducted in accordance with the signed OU 3-13 Record of Decision (DOE/ID-10660) and the Remedial Action/Remedial Design Work Plan (DOE/ID-11089) for Waste Area Group 3, OU 3-13, Group 3, Other Surface Soils Remediation Sets 1-3 (Phase I). Site CPP-67 consists of two unlined service waste (percolation) ponds that received service wastewater consisting primarily of cooling water and condensed steam generated by various INTEC operations from 1984/1985 until 2003 when replacement ponds were put into service.

Verification soil sampling was performed prior to the removal of 2 ft of contaminated soil from each pond and the demolition of associated buildings, service discharge piping, and concrete structures. Confirmatory sampling and gamma surveys were performed at each pond after excavation and demolition to confirm removal of the contaminated soil. All demolition and excavated materials were transported to the Idaho CERCLA Disposal Facility for final disposal. The area was left in a safe condition. But final remediation activities, as described in the Remedial Action/Remedial Design Work Plan, were not fully completed but deferred to a later time.

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ACRONYMS

BBWI	Bechtel BWXT Idaho, LLC
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	contaminant of concern
DEQ	Department of Environmental Quality (Idaho)
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
HPGe	high-purity germanium
ICDF	Idaho CERCLA Disposal Facility
INEEL	Idaho National Engineering and Environmental Laboratory
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
OU	operable unit
PEW	process equipment waste
RAO	remedial action objective
RD/RA	remedial design/remedial action
ROD	Record of Decision
SWP	service waste pond
WAG	waste area group

Site Completion Report for CPP-67, WAG 3, OU 3-13, Group 3, Other Surface Soils

1. INTRODUCTION

In accordance with the Idaho National Engineering and Environmental Laboratory (INEEL)[a] Federal Facility Agreement and Consent Order (DOE-ID 1991), the U.S. Department of Energy Idaho Operations Office (DOE-ID) submits this Site Completion Report for the release Site CPP-67 project, designated as Waste Area Group (WAG) 3, Operable Unit (OU) 3-13, Group 3, Other Surface Soils of the Idaho National Laboratory (INL) Site. Release Site CPP-67 is located at the Idaho Nuclear Technology and Engineering Center (INTEC) facility within the INL Site (see Figure 1-1). The completed remedial design/remedial action (RD/RA) activities identified in this report, as part of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) process, were conducted in accordance with the signed OU 3-13 Record of Decision (ROD) (DOE-ID 1999) and the RD/RA Work Plan (DOE-ID 2004a) for WAG 3, OU 3-13, Group 3, Other Surface Soils Remediation Set 1-3 (Phase I). Release Site CPP-67, Percolation Ponds 1 and 2, is part of Remediation Set 3, which is defined as "easily accessible sites with moderate environmental risk reduction" and was characterized and remediated as part of Phase I of the OU 3-13, Group 3, Other Surface Soils, remediation project (DOE-ID 2004a). This report describes the work performed and documents the current status of the project.

1.1 Site Description and History

Site CPP-67 consists of two unlined service waste (percolation) ponds (SWPs) that received service wastewater consisting primarily of cooling water and condensed steam generated by various INTEC operations. The ponds are located just outside the INTEC fenced perimeter on the southern side (see Figure 1-2). INTEC wastewater containing only traces of radioactivity (or none at all) passed through the service waste system. This waste was monitored for radioactivity before being discharged to SWP-1 or SWP-2. There were three main service waste systems at the Idaho Chemical Processing Plant (now INTEC) discharging to the ponds: the eastside system, the westside system, and the CPP-604 process equipment waste (PEW) process condensate monitor/shutdown system. Under normal conditions, radioactivity was not present in any of the service waste streams except the PEW evaporator overhead condensate, which routinely contained trace quantities of radionuclides. Therefore, because this site is associated with PEW evaporator waste, I-129 is expected in the waste.

SWP-1 (POND-YGD-326) was established in 1984 and is approximately 125 m (410 ft) long in the east-west direction, 146.3 m (480 ft) in the north-south direction, and 5.5 m (18 ft) deep. The pond was excavated into gravelly alluvium that is approximately 7.6 to 9.1 m (25 to 30 ft) thick and is underlain by basalt.

SWP-2 (POND-YGD-327) was established in 1985 when it became apparent that the infiltration capacity of SWP-1 had decreased and water levels began to rise. The pond bottom is approximately 152 m (500 ft) square and 3 to 4 m (12 to 14 ft) deep. The pond was excavated in gravelly alluvium approximately 6 to 11 m (20 to 35 ft) thick, underlain with basalt. The pond was designed to accommodate continuous disposal of approximately 11.4 million L (3 million gal) of water per day.

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a. In July 2005, the name of the Idaho National Engineering and Environmental Laboratory (INEEL) was changed to Idaho National Laboratory (INL) Site. The Idaho Cleanup Project (ICP) is the name of the project that is performing remediation work at the Idaho National Laboratory Site.

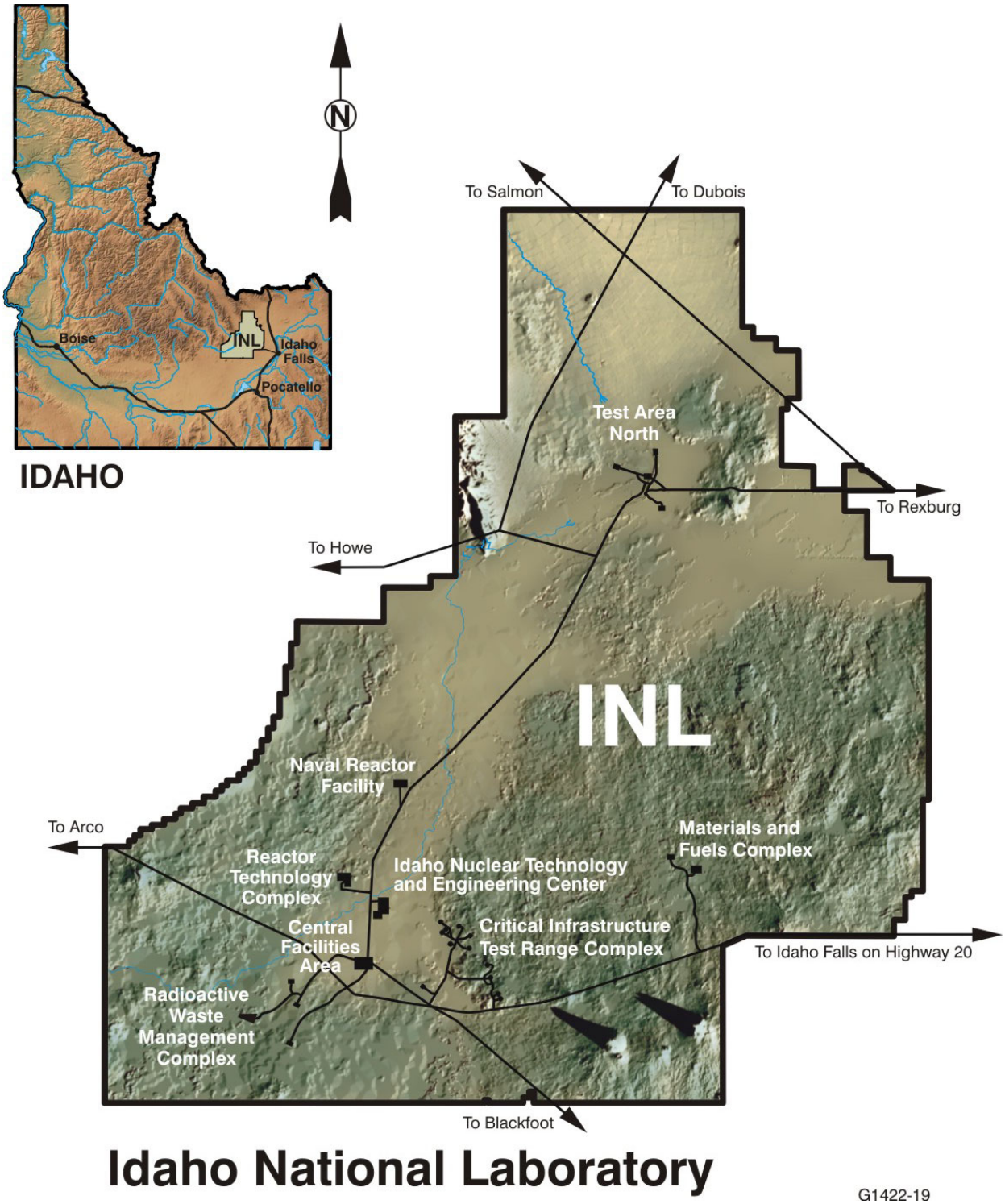

Figure 1-1. Location of INTEC within the Idaho National Laboratory Site.

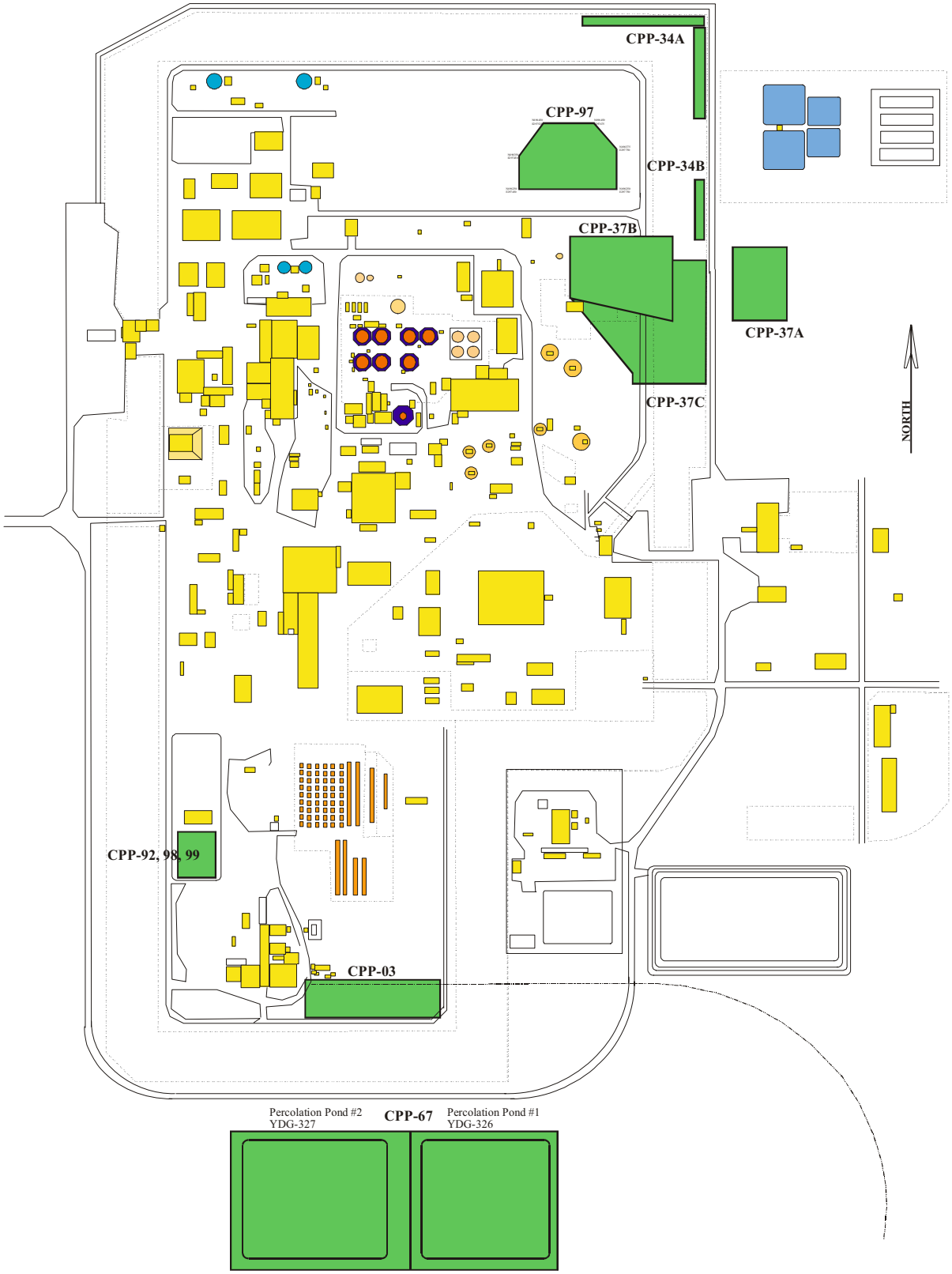

Figure 1-2. Map showing percolation ponds located just south of the INTEC facility (DOE-ID 2004a).

Resource Conservation and Recovery Act clean-closure equivalency was achieved for metals contamination in Pond SWP-1 in April 1994 and Pond SWP-2 in May 1995; therefore, only radionuclide contamination was assessed as part of the WAG 3 remedial investigation/baseline risk assessment. Site CPP-67 was considered to be a significant source of the perched water beneath the southern portion of the INTEC facility and a source of contaminants to the aquifer (DOE-ID 1999). The ponds were taken out of service in August 2002. (For further information about process knowledge and previous investigations, refer to DOE-ID 2004a.)

The extent of Site CPP-67 is known, as the boundaries of the ponds are well-defined based on documented process knowledge and analytical data.

2. CPP-67 BACKGROUND

OU 3-13 was divided into seven groups that share common characteristics and contaminant sources. Site CPP-67 was placed in Group 3 entitled "Other Surface Soils," which consists of 29 release sites within OU 3-13 that require remedial action. Within Group 3, the release sites were further broken down into six sets identified in order of decreasing priority. Of these, Sets 1, 2, and 3 were to be completed as Phase I of the OU 3-13, Group 3, Other Surface Soils, remediation project; and CPP-67 was identified as part of Remediation Set 3 (DOE-ID 2004a).

The selected remedy for the CPP-67 site is removal of contaminated soil and on-Site disposal into the Idaho CERCLA Disposal Facility (ICDF) (DOE-ID 1999). Once this has been finished and remedial activities completed, permanent land use restrictions will be placed on Site CPP-67 and the ICDF Complex, which will be closed in place, for as long as land use and access restrictions are required to be protective of human health and the environment. No planned future land uses nor operation and maintenance requirements have been identified for this site.

2.1 Summary of the Remedial Design

The remedial action objective (RAO) for CPP-67, as developed in the OU 3-13 ROD, is to prevent exposure to contaminated surface soils such that, for all surface exposure pathways, a cumulative carcinogenic risk of 1×10^{-4} and a total hazard index of 1 are not exceeded (DOE-ID 2004a). To meet this RAO, remediation goals were established and are presented in Table 2-1.

These quantitative cleanup levels are based primarily on applicable or relevant and appropriate requirements and risk-based doses (DOE-ID 1999).

Previous sampling of contaminated soils at CPP-67 had been performed and the sample results are detailed in the Group 3 RD/RA Work Plan (DOE-ID 2004a). Based on the results of these investigations, the remediation goals for Cs-137 and mercury were exceeded in samples from SWP-1; and the remediation goal for Cs-137 was exceeded in SWP-2. Because the existing data were sufficient for soil waste characterization, a waste profile was completed. In accordance with the Characterization Plan (DOE-ID 2004b), verification sampling was performed as part of waste disposal. In review of the previous sampling results, it was identified that the I-129 concentrations exceeded the ICDF landfill Waste Acceptance Criteria concentration guidelines. As a result, verification samples were required to be taken to determine the I-129 curie loading for the ICDF landfill associated with these soils to be remediated. The planned number of I-129 verification samples to be taken was based on the results from the 1991 sampling that determined the mean concentration for I-129 in SWP-1 and SWP-2 at 0.92 pCi/g and 2.03 pCi/g, respectively. However, when I-129 sampling was performed in SWP-1 prior to the remediation in 2004, the data identified higher levels of I-129 than expected. In review of this information and the fact that SWP-1 had continued to accept waste after the sampling in 1991, the Agencies agreed to collect a minimum of 66 additional I-129 samples from SWP-1. A total of 70 samples (66 samples and 4 duplicates) were collected from SWP-1 and analyzed for I-129 prior to the remediation being performed. Based on the sample results, the activity of I-129 from SWP-1 was conservatively calculated (using the 95% upper confidence limit and 1/2 of the method detection limit for all sampling having nondetectable concentrations) to be 0.031628 Ci. This activity was then compared to the ICDF landfill limit of 2.4 Ci for I-129.

I-129 verification sampling was performed in SWP-2 as the contaminated soils were removed as described in the ICDF I-129 Characterization Sampling Plan (PLN-1739). A total of 210 samples were taken and the results (validated in accordance with a Level "B") indicated that, of the 210 soil samples analyzed, the results were either qualified with a "U" (nondetect) or a "UJ" (false positive). Based on the

Table 2-1. Risk-based remediation goals for OU 3-13 soils.

Contaminant of Concern (COC)	Soil Risk-Based Remediation Goal for Single COCs (pCi/g or mg/kg)
Radionuclides	
Am-241	290
Cs-137	23
Eu-152	270
Eu-154	5,200
Pu-238	670
Pu-239/240	250
Pu-241	56,000
Sr-90	223
Nonradionuclides	
Mercury (human health)	23

sample results that identified no measurable quantity of I-129, the activity of I-129 from SWP-2 was conservatively calculated (using the 95% upper confidence limit and 1/2 of the method detection limit for all sampling having nondetectable concentrations) to be 0.0091737 Ci. This activity was then compared to the ICDF landfill limit of 2.4 Ci for I-129.

The remedial design was based on additional data required to make decisions regarding the remedial actions. The additional data requirements were

- Determine whether sites require remediation
- Ensure that adequate data are available for each site to complete a waste profile for disposal of the waste
- Determine if those wastes requiring remediation, for which iodine-129 is suspected, can be placed in the ICDF landfill.

To implement the RAO strategy, the remedial design called for an excavation depth to be based on the depth at the ponds where all detected soil COCs were below the remediation goals as presented in Table 2-1. That depth was determined to be 2.0 ft based on cesium-137 and mercury being greater than the remediation goals at 0 to 0.5 ft below ground surface and having no containment data available from 0.5-2.0 ft (DOE-ID 2004a).

The remedial design calls for the following:

1. Title II design drawings containing
    a. Demolition of existing fencing and roadways and estimated quantities of debris
    b. Final configuration of fences, roadways, ditches, etc.

c. Plot plans and contours and quantities

d. Sections and excavation profiles.

2. Rerouting of existing utilities and surface features. Activities will be primarily limited to protecting the utilities while modifying surface features.

3. The demolition of Buildings CPP-1611 and CPP-1612, fencing, and several concrete slabs.

4. The plugging and abandonment of Well SWPP-23.

5. Portions of the service waste line and redundant service waste line to be cut, capped, and removed.

6. Excavating contaminated soil from the bottom of each pond to a depth of 2 ft (based on existing sampling data) for an estimated total volume of 29,885 yd^3.

7. Importing approximately 29,000 yd^3 of backfill material from the adjacent stockpiles to the south of the existing ponds. The ponds are not to be backfilled, but the side slopes are to be shaped to a 4:1 slope. Approximately 10,000 yd^3 of topsoil will be placed over the pond surfaces and side slopes in a 6-in. lift.

8. Revegetation of the ponds will complete remediation of this site.

3. REMEDIATION AND DEMOLITION ACTIVITIES

Remediation and demolition activities followed the scope of work provided to ICDF Project Management, which was based off of the OU 3-13 site areas excavation (per the general sequencing plan) as outlined in the RD/RA Work Plan (DOE-ID 2004a). The scope of work did differ from the work plan, and these differences are described below. No construction interface documents were issued changing the scope of the work regarding the work plan and actual construction.

3.1 Site Mobilization and Infrastructure Establishment

Subcontractor mobilization began in July 2004. Work on improving the infrastructure was started first and included the following activities:

- A controlled-access haul road was constructed between CPP-67 and the ICDF.
- A temporary scale was installed to track quantities of soil removed from each pond.
- A dust control system that used water was installed.
- The fencing around the two ponds was modified in preparation for demolition and excavation activities.
- Confirmation of the location and orientation of the diversion valves for the primary and redundant service waste lines was completed and the utility isolation plan was finalized.
- Soil ramps were installed in each pond.

3.2 Demolition

After the establishment of the remediation infrastructure, demolition began following the CPP-Demolition Plan (Drawing 626044, DOE-ID 2004a) and the Piping Plan (Drawing 626014, DOE-ID 2004a) with completions described as follows:

- Buildings CPP-1611 and CPP-1612 rested on a 6-in.-thick concrete slab and contained piping of various diameters that extended through each concrete slab, angled underground, and terminated near the base of each pond. The piping contained water level detectors, and the buildings contained instrumentation and isolated 12-volt power sources to monitor the water levels. The associated concrete slabs, piping, and instrumentation wiring were removed, demolished, and transported to the ICDF.
- The staff gauges from each pond were removed and transported to the ICDF.
- The concrete splash guards, located at the primary and redundant discharge lines (two each per pond) were removed and transported to the ICDF.
- The primary and redundant discharge piping from just prior to the tees to the discharge points were cut, removed, and transported to the ICDF. The remaining piping (14-in. polyethylene) was capped in place (see Drawing 626014, DOE-ID 2004a). The two manholes that contained the flow direction/control valves were removed and transported to the ICDF.

- The contaminated soil was excavated from the bottom of each pond to a depth of 2 ft (based on existing sampling data) for an estimated total volume of 29,885 yd^3.

The demolition plan called for the metal chain-link fencing to be removed, the wire mesh to be salvaged, and the steel posts and concrete to be disposed of. This demolition was deferred to a later time (see Section 6 for more information). The demolition plan also called for the removal of Monitoring Well SWPP-23, which was delayed due to unfavorable site conditions. Its removal has been rescheduled for fall 2005.

3.3 Excavation

Excavation activities followed the CPP-Demolition Plan (Drawing #626044). Pond 2 was excavated first. Work took place August 9 to October 4, 2004, with the removal of 2 ft of soil from the pond's bottom. Total volume removed and transported to the ICDF was 21,026 yd^3.

The excavation of Pond 1 took place from October 5 through November 2, 2004, with the removal of 2 ft of soil from most of the pond's bottom. Basalt was hit in the southeast and southwest corners and along the west side of the pond's bottom at less than the 2-ft depth originally planned for excavation. Excavation stopped in these areas at the top of the basalt. Total volume removed and transported to the ICDF was 9,462 yd^3.

3.4 Area Completion

The finish plan called for the importing of approximately 29,000 yd^3 of backfill material from the adjacent stockpiles to the south of the existing ponds. The ponds were not to be backfilled but the side slopes were to be shaped to a 4:1 slope. Approximately 10,000 yd^3 of topsoil were to be placed over the pond surfaces and side slopes in a 6-in. lift, and the areas were to be revegetated to complete the remediation process. This work was not performed and deferred to a later time (see Section 6 for more information).

4. CHRONOLOGY OF EVENTS

Table 4-1 presents a chronology of events for the CPP-67 project.

Table 4-1. Chronology of events.

Date	Event
October 7, 1999	Final ROD for the Idaho Nuclear Technology and Engineering Center signed.
February 2004	RD/RA Work Plan is finalized and transmitted.
April 2004	Verification soil sampling performed at Ponds 1 and 2.
July 2004	Mobilization begins with the establishment of infrastructure improvements (build controlled access haul road from CPP-67 to ICDF, install temporary scales, install dust control system).
August 9, 2004	The CPP-67 mobilization complete and excavation at Pond 2 begins.
August 19, 2004	Development of Set 1 waste profiles is complete.
August 19, 2004	Verification soil sampling began at Pond 2 during excavation following PLN-1739, "ICDF I-129 Characterization Sampling—CPP-67 Perc Ponds (ESP-062-04)."
September 2004	Reverification sampling activity began at Pond 1 according to the "ICDF Characterization Sampling, CPP-67 Percolation Pond 1, Resample (ESP-106-04)," (PLN-1802).
September 2, 2004	An agreement was reached with the Agencies on the sampling requirements for the Pond 1 and preparation of the associated waste profile.
September 21, 2004	Verification soil sampling was completed at Pond 2 during excavation following PLN-1739, "ICDF I-129 Characterization Sampling—CPP-67 Perc Ponds (ESP-062-04)."
September 27, 2004	The CPP-67 Pond 1 waste stream is accepted for disposal in the ICDF landfill.
September 30, 2004	An approval was received to use the remaining water in the service wastewater lines for dust suppression during remediation of Pond 1.
	Preparations for remediation of Pond 1 began with the installation of a truck ramp into the pond.
October 4, 2004	Excavation from Pond 2 complete. A total of 21,026 yd^3 of soil removed and transferred to the ICDF.
October 5, 2004	Excavation work begins at Pond 1.
October 7, 2004	A letter was received from the Idaho Department of Environmental Quality (DEQ) concerning the laboratory analysis results for iodine-129. A conference call was held on October 7, 2004, to address this issue (results from the conference call to be incorporated into the characterization report).

Table 4-1. (continued.)

Date	Event
October 8, 2004	Water in the service wastewater lines was used for dust suppression during remediation of Pond 1. Pond 2 excavation completed, and a gamma survey was performed. No cesium-137 concentrations over 23 pCi/g were found.
	The service waste lines were cut and capped according to the design.
	Remediation of Pond 1 began and excavation is in progress.
October 19, 2004	A site tour was held in the presence of DEQ, Environmental Protection Agency, DOE, and Bechtel BWXT Idaho, LLC (BBWI) representatives.
November 2004	Field gamma gross radiation measurements at the east and west percolation ponds were completed by November 2004 after completion of all excavation.
November 2, 2004	Excavation work complete at Pond 1. A total of 9,462 yd^3 were removed and sent to the ICDF from Pond 1.
November 5, 2004	Remediation of Pond 1 was completed. (This meets the performance-based incentive goals for excavation of the old INTEC percolation ponds.)
November 10, 2004	The draft Characterization Report for Remediation Set 1 was transmitted to the Agencies.
November 11, 2004	Sidewall survey (gamma scan) was completed for Pond 1 with no significant cesium detected.
November 15, 2004	Confirmatory soil sampling was performed at each pond according to the sampling plan entitled Chemical Processing Plant (CPP)-67 Confirmatory Sampling (INTEC Ponds 1 and 2) (ESP-116-04) (Kirchner 2005).
November 19, 2004	The sidewall survey (gamma scan) was completed for Pond 2 with no significant cesium detected.
	Subcontractor demobilization was completed with the decontamination of equipment.
November 24, 2004	The facility transfer back to Tenant and Support Operations from ICDF is in progress.
November 26, 2004	Confirmatory sampling was completed.
	Subcontractor demobilization was completed with the decontamination of equipment.
December 3, 2004	The iodine-129 sample validation was completed.
January 14, 2005	Additional iodine-129 analysis data were received from the BWXT laboratory. Work began to update the Characterization Report.
January 20, 2005	The limitations and validation report for the additional iodine-129 analysis was received.
January 27, 2005	The limitations and validation report for the additional iodine-129 analysis was transmitted to the Agencies.
May 4, 2005	Draft Characterization Report was completed.
July 20, 2005	Characterization Report finalized.

5. PERFORMANCE STANDARDS AND CONSTRUCTION QUALITY CONTROL

The RAO for the CPP-67 site, as stated in the RD/RA Work Plan for Group 3 soils, is to prevent exposure to contaminated surface soils at each release site, such that for all surface exposure pathways, a cumulative carcinogenic risk of 1×10^{-4} and a total hazard index of 1 are not exceeded at each release site. To meet this RAO, remediation goals were established in the OU 3-13 ROD (DOE-ID 1999, p. 8–4) to ensure a risk-based protectiveness of human health and the environment. The project's performance results compared to remediation goals are listed in Table 5-1, showing that the RAO was achieved.

Table 5-1. Comparison between risk-based remediation goals and performance levels achieved for OU 3-13 soils.

Contaminant of Concern	Soil Risk-Based Remediation Goal for Single COCs (pCi/g or mg/kg)	Performance Level Achieved[a] (pCi/g or mg/kg)
Radionuclides		
Am-241	290	NA
Cs-137	23	5.21E+00 ±2.55E-01 pCi/g
Eu-152	270	Nondetect
Eu-154	5,200	Nondetect
Pu-238	670	NA
Pu-239/240	250	NA
Pu-241	56,000	NA
Sr-90	223	NA
Nonradionuclides		
Mercury (human health)	23	1.4 mg/kg

a. Performance level results are the highest analytical results received from both ponds.
NA = not applicable.

5.1 Sampling Activities and Results

Soil sampling was performed during four activities (performed by the Environmental Services Project) as listed in Table 5-2.

5.1.1 ESP-034-04 Sampling Activity

Initial verification soil samples were collected from both ponds following PLN-1662, "ICDF Verification Sampling—CPP-67 Perc Ponds (ESP-034-04)." In April of 2004, soil samples were taken from the bottom of each pond, at depths ranging from 12 to 36 in. using a grid pattern in the pond and sent to an off-Site laboratory to be analyzed for metals. Verification sample results validated the original characterization data for Pond 2. However, the sample results from Pond 1 exceeded acceptable validation levels for some of the contaminants, which led to a resample of Pond 1 under activity ESP-106-04.

Table 5-2. Environmental Services Project soil sampling activities for CPP-67.

Characterization Sampling Number	Title	Sample Dates	Analytes Sampled For
ESP-034-04	ICDF Verification Sampling—CPP-67 Percolation Ponds (Ponds 1 and 2)	April 2004	Metals
ESP-062-04	ICDF I-129 Characterization Sampling—CPP-67 Perc Ponds (Pond 2)	August 19–September 21, 2004	I-129
ESP-106-04	ICDF Characterization Sampling—CPP-67 Percolation Pond 1—Resample	September 23-28, 2004	I-129
ESP-116-04	Chemical Processing Plant (CPP)-67 Confirmatory Sampling (INTEC Ponds 1 and 2)	November 15, 2004	Gamma-emitting radionuclide activity, I-129, mercury

5.1.2 ESP-062-04 Sampling Activity

Verification soil sampling was conducted at Pond 2 during excavation following PLN-1739, "ICDF I-129 Characterization Sampling—CPP-67 Perc Ponds (ESP-062-04)." Sampling was performed from August 19, 2004, through September 21, 2004. A total of 210 soil samples for iodine-129 were intermittently collected from the top of the soil piled in the excavator so that approximately every 5,000 yd^3, which were removed, were sampled. This resulted in the collection of 210 samples that were analyzed at an off-Site laboratory (see Table B-1 in Appendix B). Data returned to the project were validated in accordance with a Level "B" validation.

5.1.3 ESP-106-04 Sampling Activity

Because soil sample results taken from Pond 1 in April 2004 exceeded acceptable levels (exceeded the upper bounds of the waste profile), a re-verification sampling activity was performed according to the "ICDF Characterization Sampling, CPP-67 Percolation Pond 1, Resample (ESP-106-04)" (PLN-1802). In September 2004, 66 samples were taken with four duplicates from a grid pattern in the pond and sent to an off-Site laboratory to be analyzed for iodine-129. The grid pattern used divided the pond bottom into 100 equally sized rectangles measuring approximately 41 × 48 ft. The samples were collected from 2-ft depths except where sloughing prevented it, in which case the depth at which refusal was met was noted in the field logbook and sampling proceeded. The data were validated in accordance with a Level "B" validation (see Table B-2 in Appendix B).

5.1.4 ESP-116-04 Sampling Activity

Confirmatory soil sampling was performed at each pond after completion of excavation activities following the sampling plan entitled "Chemical Processing Plant (CPP)-67 Confirmatory Sampling (INTEC Ponds 1 and 2)" (ESP-116-04 in Kirchner 2005). Sampling was performed on November 15, 2004, and samples were collected for gamma-emitting radionuclide activity and iodine-129. In addition, soil samples for mercury were collected from Pond 1. The samples were collected from eight randomly selected locations at each pond following a 20- × 20-ft grid (DOE-ID 2004c). The data were validated in accordance with a Level "B" validation. Radiological analyte data from Pond 1 are presented in Table B-3 in Appendix B. Radiological analyte data from Pond 2 are presented in Table B-4 in Appendix B. Mercury data from Pond 1 are presented in Table B-5 in Appendix B.

5.2 High-Purity Germanium Results and Maps

Field gamma gross radiation measurements at the east and west percolation ponds were completed by November 2004 after completion of all excavation. Figure 5-1 contains an aerial photograph of the two ponds with plotted measurement locations. For the west side pond, a Trimble Global Positioning System with survey-grade positioning was used to establish a grid shaped like an "X." Points around the high water line of the four slopes supplemented this pattern. For the east side pond, the same instrument was used, but a systematic grid pattern on the pond's bottom was established. Points around the high water line of the four slopes also supplemented this pattern.

The system used for data collection consisted of a 42% efficient (relative to 3 × 3 sodium iodine) high-purity germanium (HPGe) detector mounted on a tripod with the detector face positioned 1 m (3.28 ft) above ground. This arrangement yielded an optical field of view of about 15.2 m (50 ft) in diameter at each measurement point. The detector was quality-control checked daily using a multinuclide point source traceable to the National Institute of Standards and Technology. The results from these checks were control charted daily, and all values were within control limits for the duration of the project. Count times were for 20 to 30 minutes, which gave precisions on the reported cesium-137 concentration values that are < ±10% at the 2-sigma confidence level. The spectral data were analyzed using a wireless-based Panasonic Toughbook computer. The ISOPLUS soil analysis program (Advanced Measurement Technologies, Inc. 2002) was used to calculate the final cesium-137 concentrations using the US DOE M1 analysis protocol (DOE 1997) that has been used extensively at the INL Site and other DOE sites.

The results of the activity showed that all values for cesium-137 were <23 pCi/g, meaning that the remedial action goal for these ponds has been met for cesium-137. These results are illustrated in Figure 5-2 for the west percolation pond and in Figure 5-3 for the east percolation pond. The HPGe data are located in Appendix C.

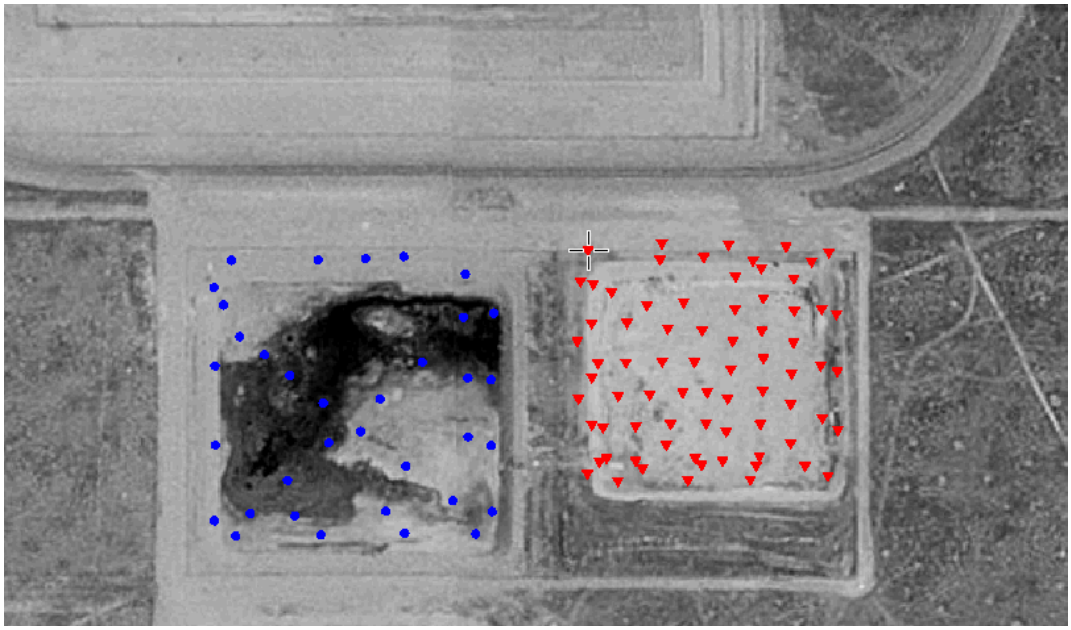

Figure 5-1. Aerial photograph of the west and east percolation ponds showing data measurement locations and grid pattern (north is up, no scale).

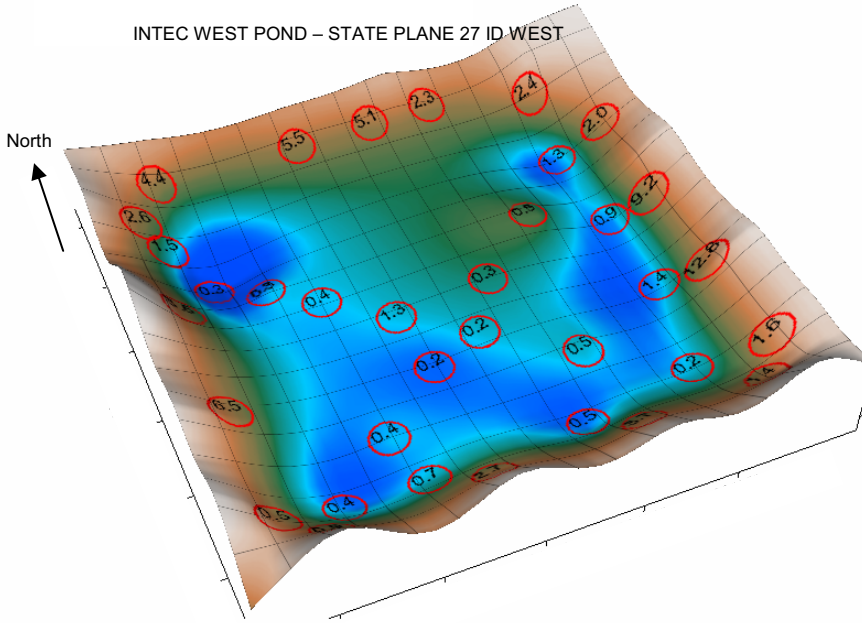

Figure 5-2. West percolation pond showing HPGe readings of cesium-137 in pCi/g (no scale).

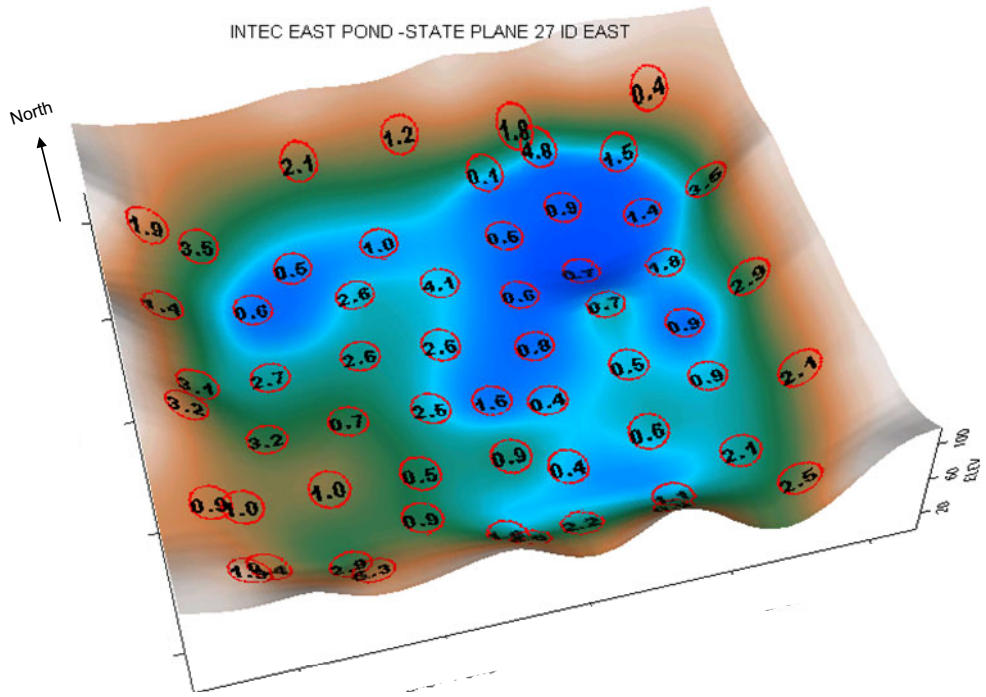

Figure 5-3. East percolation pond showing HPGe readings of cesium-137 in pCi/g (no scale).

6. FINAL INSPECTION AND CERTIFICATION

No formal prefinal or final inspection of Area CPP-67 was held. However, a site tour was held on October 19, 2004, in the presence of DEQ, Environmental Protection Agency, DOE, and BBWI representatives. The objective of the tour was to familiarize new DEQ WAG managers with the project and get an understanding of the status and path forward. Excavation at Pond 2 was in progress during this tour. No deficiencies were identified; however, one observation was given by DEQ: it was stated that efforts should be given to collect side-slope data after excavation to confirm that contaminated soil is not left in place. In response to this observation, direction was given to collect HPGe data along the high water line. Collection of this data was completed in November 2004, and the discussion of this data collection is contained in Section 5, with the data results contained in Appendix C.

During this tour, discussions were held concerning the final configuration of the site. Modifications to the work plan scope were agreed on that included delaying the requirements to backfill and reshape the slopes, add top soil, reseed, and remove the fence. This would allow for the site to be left available for some future use. The identified requirements will be completed at a later time when the site's ultimate disposition is determined.

7. OPERATION & MAINTENANCE

No operation or maintenance activities are required for release Site CPP-67. From a CERCLA perspective, the remediation has been successful. The risk to human health and the environment from the CERCLA constituents has been removed, and the soils meet the OU 3-13 remediation goals.

The only aboveground infrastructure remaining at the site is the metal chain-link fence that has been left in place for administrative controls and possible future use of the area. The fence will restrict access to the area to prevent unwanted animal intrusion, unwanted vehicle traffic, and undesirable use of the area (equipment/material storage or illegal dumping). Any required maintenance on the fence will be the responsibility of the areawide facility owner and not the responsibility of the CERCLA project management.

8. SUMMARY OF PROJECT COSTS

Table 8-1 summarizes the total costs for the remedial work as described in this report.

Table 8-1. Total cost for TFIA remedial action.

Description	Subtotal	Total
Project management, engineering, construction support	$102,000	
Subcontract	$1,937,000	
		$2,039,000

9. CPP-67 PROJECT CONTACT INFORMATION

Table 9-1 provides contacts for the CPP-67 project.

Table 9-1. Contact information for the CPP-67 project.

Title	Name
DOE Idaho project manager	Mary Verwolf
Primary contractor Subproject 6 project engineer	Marty Doornbos
Primary contractor Subproject 6 project manager	Lee Davison
Primary contractor subcontractor technical representative	Jody Landis
Primary contractor ICDF project manager	Jack Simonds
Primary contractor ICDF facility manager	Mike Edgett
Primary contractor radiological control technician foreman	Randy Spruill
Primary contractor subcontract administrator	Mike Drake
Stoller project management	Randy Haws
Stoller remediation lead	Brian Martenson
Envirocon facility manager	Dave Irvin
Idaho DEQ INL discipline lead	Mark Clough
U.S. Environmental Protection Agency	Dennis Faulk

10. REFERENCES

ISO-Plus-B32 Software User's Manual, Version 3, Oak Ridge, Tennessee: Advanced Measurement Technologies, Inc., 2002.

DOE, 1997, *Procedures Manual*, HASL-300, 28th edition, Environmental Measurements Laboratory, U.S. Department of Energy, February 1997.

DOE-ID, 1991, *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory,* Department of Energy Idaho Field Office, Environmental Protection Agency Region 10, State of Idaho Department of Health & Welfare, December 1991.

DOE-ID, 1999, *Final Record of Decision, Idaho Nuclear Technology and Engineering Center, Operable Unit 3-13,* DOE/ID-10660, Rev. 0, U.S. Department of Energy Idaho Operations Office, October 1999.

DOE-ID, 2004a, *Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 1-3 (Phase I) Remedial Design/Remedial Action Work Plan*, DOE/ID-11089, Rev. 0, U.S. Department of Energy Idaho Operations Office, February 2004.

DOE-ID, 2004b, *Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 1-3 (Phase I) Characterization Plan*, DOE/ID-11090, Rev. 0, U.S. Department of Energy Idaho Operations Office, February 2004.

DOE-ID, 2004c, *Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 1-3 (Phase I) Field Sampling Plan*, DOE/ID-11091, Rev. 0, U.S. Department of Energy Idaho Operations Office, February 2004.

Kirchner, D. R., Bechtel BWXT Idaho, to R. S. Rice, Bechtel BWXT Idaho, February 15, 2005, "Closure Report for ESP-116-04 CPP-67 Confirmatory Sampling (INTEC Ponds 1 and 2) Project," ESP-116-04.

PLN-1662, 2004, "ICDF Verification Sampling—CPP-67 Perc Ponds (ESP-034-04)," Rev. 2, Idaho National Engineering and Environmental Laboratory, April 2004.

PLN-1739, 2004, "ICDF I-129 Characterization Sampling—CPP-67 Perc Ponds (ESP-062-04)," Rev. 1, Idaho National Engineering and Environmental Laboratory, August 2004.

PLN-1802, 2004, "ICDF Characterization Sampling, CPP-67 Percolation Pond 1 - Resample (ESP-106-04)," Rev. 0, Idaho National Engineering and Environmental Laboratory, September 2004.

Appendix A

Project Completion Drawings

Project completion drawings are as follows:

625995

626004

626007.

Appendix A
Project Completion Drawings

FMT-01-REV 3.3

REVISIONS		
REV	DESCRIPTION	EFFECTIVE DATE:
1	AS-BUILT AS OF 4/19/05 SEE DAR -121386	

DRAWING INDEX

PAGE NO.	DWG NO.	A-E DWG NO.	REV	DRAWING TITLE
1	625994	T-1	1	INTEC AREA AND INEEL SITE MAPS
2	625995	T-2		DRAWING INDEX
				REMEDIATION SET-1
3	625996	C-1		REMEDIATION SET-1 AREA MAP AND HAUL ROUTES
4	625997	C-2		CPP-92, 98 AND 99 ENLARGED PLAN
5	625998	C-3		CPP-97 ENLARGED PLAN
				REMEDIATION SET-3
6	625999	C-4		REMEDIATION SET-3 AREA MAP AND HAUL ROUTES
7	626000	C-5		CPP-34A DEMOLITION PLAN
8	626001	C-6		CPP-34A FINISH PLAN
9	626002	C-7		CPP-34B DEMOLITION AND FINISH PLANS
10	626003	C-8		EXCAVATION SECTIONS
11	626004	C-9	1	CPP-67 PLAN
12	626005	C-10		CPP-67 FINISH PLAN
13	626006	C-11		STOCKPILES 1 AND 2 PLAN
14	626007	C-12	1	EXCAVATION AND FILL SECTIONS
15	626008	C-13		CPP-3 DEMOLITION PLAN
16	626009	C-14		CPP-3 FINISH PLAN
17	626010	C-15		EXCAVATION SECTIONS AND DETAIL
18	626011	C-16		BYPASS ROAD
19	626012	C-17		DITCH, ROAD AND FENCE DETAILS
20	626013	C-18		PHOTOS
21	626014	P-1		SITE CPP-67 PIPING PLAN
22	626015	E-1		SITE CPP-3 ELECTRICAL PLAN
23	626016	E-2		CPP-603 PARTIAL PLAN

GENERAL NOTES

1. RETAIN AND PROTECT ALL FACILITIES UNLESS OTHERWISE NOTED.
2. SEE PLAN SHEETS OF SITES FOR THE ESTIMATING BASES FOR EXCAVATION AND BACKFILL QUANTITIES.

FOR DRAWING INDEX SEE DRAWING NO. 625995	SUBCONTRACT NO. N/A	INEEL Idaho National Engineering & Environmental Laboratory BECHTEL BWXT IDAHO, LLC
NO SCALE	REQUESTER: KIM ROGERS DESIGN: C.O. KINGSFORD DRAWN: ROB HERGESHEIMER PROJECT NO. 23083 SPEC CODE	WAG-3 OU 3-13 GROUP 3 OTHER SURFACE SOILS REMEDIAL DESIGN DRAWING INDEX
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FWT-D1-REV 3.3

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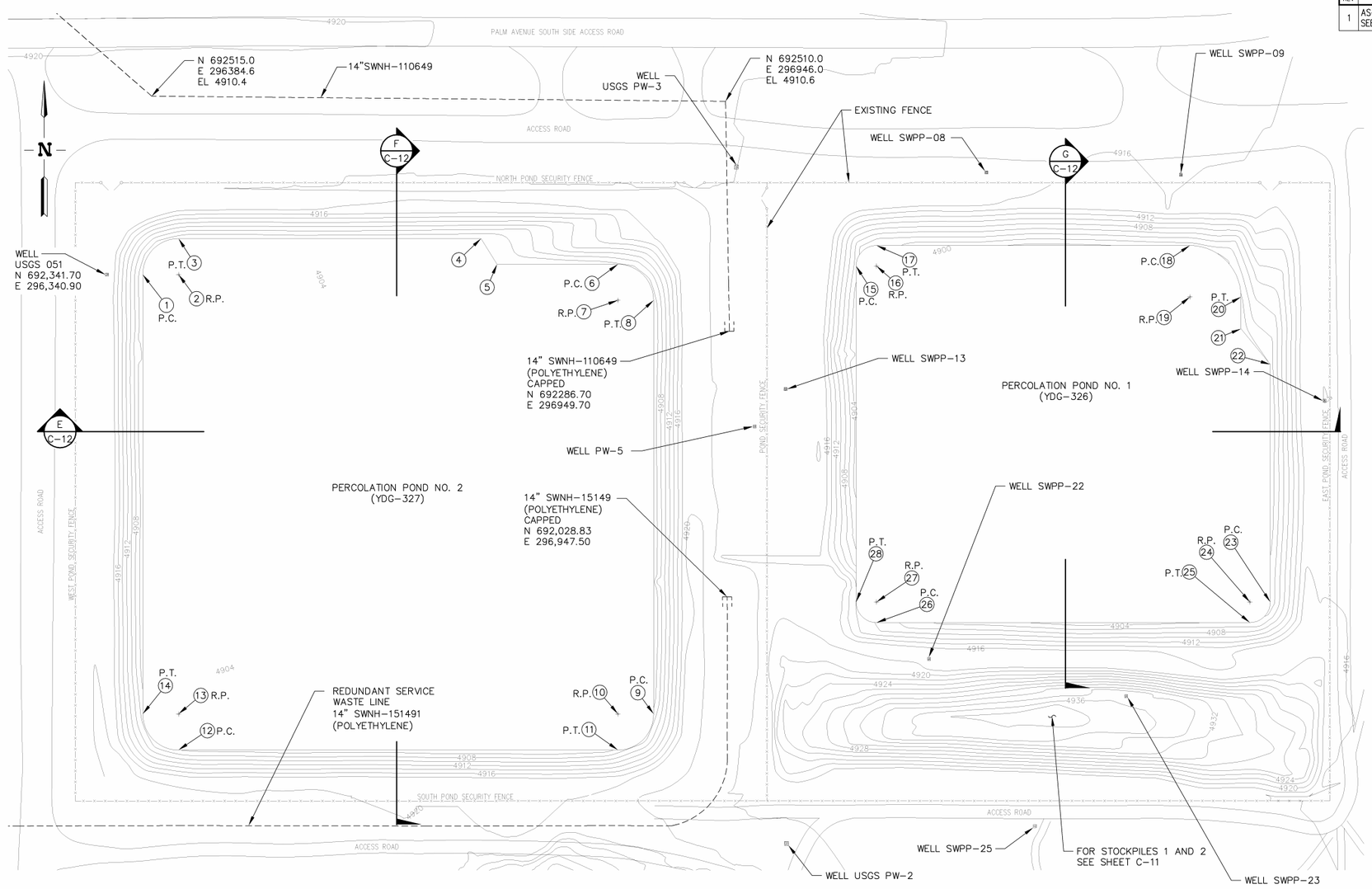

CPP-67 PLAN

SCALE: 1"=50.0
BASED ON SITE SPECIFIC DATUM

LEGEND

49XX	EXISTING CONTOURS
XX	COORDINATE TABLE MARK
P.C.	POINT OF CURVATURE
P.T.	POINT OF TANGENT
R.P.	RADIUS POINT

COORDINATE TABLE

DATUM: HORIZONTAL: INTEC SITE SPECIFIC
VERTICAL: INTEC SITE SPECIFIC

NO.	NORTHING	EASTING	ELEVATION
1	692,341.79	296,375.89	--
2	692,341.79	296,410.89	--
3	692,376.79	296,410.89	--
4	692,376.79	296,706.83	--
5	692,351.82	296,722.47	--
6	692,351.82	296,840.65	--
7	692,316.82	296,840.65	--
8	692,316.82	296,875.65	--
9	691,915.04	296,875.65	--
10	691,915.04	296,840.65	--
11	691,880.04	296,840.65	--
12	691,880.04	296,410.89	--
13	691,915.04	296,410.89	--
14	691,915.04	296,375.89	--
15	692,350.05	297,073.63	--
16	692,350.05	297,093.63	--
17	692,370.05	297,093.63	--
18	692,370.05	297,400.20	--
19	692,320.05	297,400.20	--
20	692,320.05	297,450.20	--
21	692,289.16	297,450.20	--
22	692,254.69	297,478.79	--
23	692,023.82	297,478.79	--
24	692,023.82	297,458.79	--
25	692,003.82	297,458.79	--
26	692,003.82	297,093.63	--
27	692,023.82	297,093.63	--
28	692,023.82	297,073.63	--

FOR DRAWING INDEX SEE DRAWING NO. 625995	SUBCONTRACT NO. N/A	INEEL Idaho National Engineering & Environmental Laboratory BECHTEL BWXT IDAHO, LLC
50' 30' 10' 0 50' SCALE: 1" = 50.0'	REQUESTER: KIM ROGERS DESIGN: C.O. KINGSFORD DRAWN: Lucy Koeller PROJECT NO. 23083 SPEC CODE	WAG-3 OU 3-13 GROUP 3 OTHER SURFACE SOILS REMEDIAL DESIGN CPP-67 PLAN
DESIGN PHASE:	FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO. 108956	SIZE D · CAGE CODE 01MF3 · INDEX CODE NUMBER AREA 200 TYPE 0100 Q 02 ORIG 090 · DWG-626004 · REV 1
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FMT-D1-REV 3.4

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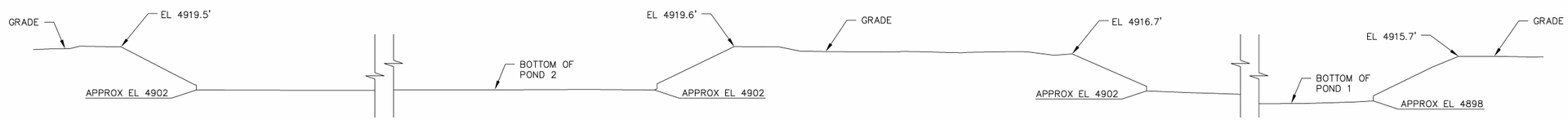

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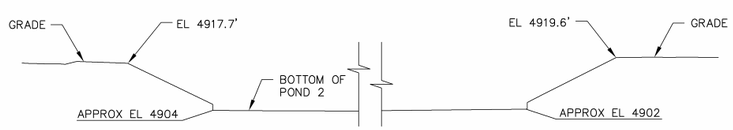

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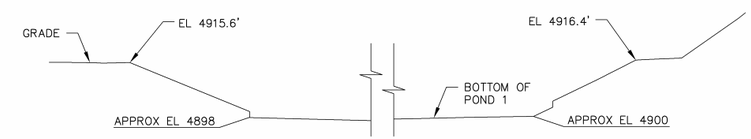
(POND 2)



SECTION G C-9
SCALE: 1"=20.0'
(POND 1)

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20' 10' 5' 0 20' SCALE: 1" = 20.0'	REQUESTER: N.K. ROGERS DESIGN: C.O. KINGSFORD DRAWN: Chris Keller PROJECT NO. 23083 SPCL CODE	WAG-3 OU 3-13 GROUP 3 OTHER SURFACE SOILS REMEDIAL DESIGN EXCAVATION AND FILL SECTIONS
DESIGN PHASE:	FOR REVIEW/APPROVAL SIGNATURES SEE DAR NO. 108956	SIZE D; CAGE CODE 01MF3; INDEX CODE NUMBER AREA 200, TYPE 9999, CL 02, ORIG 090; DWG- 626007; REV 1
SAFETY CATEGORY: CG	EFFECTIVE DATE: 02/05/2004	SCALE: NOTED; SHEET C-12

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Appendix B

Soil Sampling Results

Appendix B

Soil Sampling Results

Table B-1. ESP-062-04 verification sample results for I-129.

Sample ID	Radionuclide	Sample Value (pCi/g)	Validation Flag	Sample Uncertainty (pCi/g)	MDA[a] (pCi/g)
E0620300001RI	IODINE-129	6.83E-02	(U)	3.98E-01	7.66E-01
E0620300101RI	IODINE-129	3.86E-01	(U)	3.39E-01	7.01E-01
E0620300201RI	IODINE-129	1.80E-02	(U)	3.36E-01	6.45E-01
E0620300301RI	IODINE-129	2.24E-01	(U)	3.28E-01	6.61E-01
E0620300401RI	IODINE-129	4.46E-01	(U)	2.70E-01	5.95E-01
E0620300501RI	IODINE-129	-1.10E-01	(U)	2.55E-01	4.75E-01
E0620300601RI	IODINE-129	8.92E-02	(U)	2.04E-01	5.17E-01
E0620300701RI	IODINE-129	2.55E-01	(U)	2.67E-01	5.59E-01
E0620300801RI	IODINE-129	9.31E-02	(U)	3.95E-01	7.68E-01
E0620300901RI	IODINE-129	-3.14E-02	(U)	3.04E-01	5.80E-01
E0620301001RI	IODINE-129	8.09E-02	(U)	2.03E-01	5.20E-01
E0620301101RI	IODINE-129	1.06E-02	(U)	2.60E-01	5.10E-01
E0620301201RI	IODINE-129	-1.80E-03	(U)	5.12E-01	9.65E-01
E0620301301RI	IODINE-129	6.72E-01	(U)	3.40E-01	7.37E-01
E0620301401RI	IODINE-129	-3.78E-01	(U)	3.23E-01	5.64E-01
E0620301501RI	IODINE-129	3.15E-01	(U)	2.63E-01	5.67E-01
E0620301601RI	IODINE-129	-3.42E-01	(U)	3.61E-01	6.31E-01
E0620301701RI	IODINE-129	2.15E-01	(U)	2.71E-01	5.58E-01
E0620301801RI	IODINE-129	2.47E-01	(U)	3.27E-01	6.61E-01
E0620301901RI	IODINE-129	2.95E-01	(U)	2.51E-01	6.49E-01
E0620301902RI	IODINE-129	2.73E-01	(U)	3.34E-01	6.79E-01
E0620302001RI	IODINE-129	4.30E-01	(U)	2.97E-01	6.38E-01
E0620302101RI	IODINE-129	2.95E-01	(U)	2.41E-01	5.23E-01
E0620302201RI	IODINE-129	5.15E-01	(U)	3.20E-01	6.26E-01
E0620302301RI	IODINE-129	5.54E-01	(U)	3.32E-01	7.13E-01
E0620302401RI	IODINE-129	-1.93E-01	(U)	3.45E-01	6.31E-01
E0620302501RI	IODINE-129	9.54E-02	(U)	2.25E-01	4.68E-01
E0620302601RI	IODINE-129	1.34E-01	(U)	2.57E-01	5.27E-01
E0620302701RI	IODINE-129	1.01E-01	(U)	3.18E-01	6.27E-01
E0620302801RI	IODINE-129	3.69E-01	(U)	2.17E-01	5.03E-01
E0620302901RI	IODINE-129	5.32E-01	(UJ)	2.41E-01	5.70E-01
E0620303001RI	IODINE-129	-1.61E-01	(U)	3.00E-01	5.51E-01

Table B-1. (continued).

Sample ID	Radionuclide	Sample Value (pCi/g)	Validation Flag	Sample Uncertainty (pCi/g)	MDA[a] (pCi/g)
E0620303101RI	IODINE-129	3.52E-01	(U)	3.03E-01	6.42E-01
E0620303201RI	IODINE-129	-5.72E-02	(U)	3.01E-01	5.74E-01
E0620303301RI	IODINE-129	5.06E-01	(UJ)	2.43E-01	5.70E-01
E0620303401RI	IODINE-129	2.32E-01	(U)	2.03E-01	5.39E-01
E0620303501RI	IODINE-129	4.30E-01	(U)	2.64E-01	5.86E-01
E0620303601RI	IODINE-129	-3.21E-03	(U)	2.46E-01	4.79E-01
E0620303701RI	IODINE-129	1.33E-01	(U)	2.97E-01	5.96E-01
E0620303801RI	IODINE-129	-2.55E-01	(U)	2.95E-01	5.23E-01
E0620303901RI	IODINE-129	2.63E-01	(U)	3.08E-01	6.35E-01
E0620303902RI	IODINE-129	1.62E-02	(U)	2.52E-01	4.95E-01
E0620304001RI	IODINE-129	-1.31E-02	(U)	2.97E-01	5.75E-01
E0620304101RI	IODINE-129	2.53E-01	(U)	2.63E-01	5.55E-01
E0620304201RI	IODINE-129	6.44E-01	(UJ)	2.24E-01	6.23E-01
E0620304301RI	IODINE-129	8.05E-02	(U)	2.48E-01	4.99E-01
E0620304401RI	IODINE-129	8.57E-02	(U)	2.49E-01	5.03E-01
E0620304501RI	IODINE-129	-8.09E-02	(U)	2.42E-01	4.67E-01
E0620304601RI	IODINE-129	1.58E-01	(U)	2.13E-01	4.54E-01
E0620304701RI	IODINE-129	4.23E-01	(U)	2.32E-01	5.31E-01
E0620304801RI	IODINE-129	-5.33E-02	(U)	2.71E-01	5.21E-01
E0620304901RI	IODINE-129	4.80E-01	(UJ)	1.74E-01	5.05E-01
E0620305001RI	IODINE-129	1.57E-01	(U)	1.48E-01	4.04E-01
E0620305101RI	IODINE-129	-5.20E-02	(U)	1.65E-01	4.09E-01
E0620305201RI	IODINE-129	-2.63E-01	(U)	2.39E-01	4.11E-01
E0620305301RI	IODINE-129	1.55E-01	(U)	2.35E-01	4.93E-01
E0620305401RI	IODINE-129	9.39E-02	(U)	1.93E-01	4.08E-01
E0620305501RI	IODINE-129	1.71E-01	(U)	2.07E-01	4.44E-01
E0620305601RI	IODINE-129	3.03E-01	(U)	3.55E-01	7.20E-01
E0620305701RI	IODINE-129	-2.10E-01	(U)	2.61E-01	4.67E-01
E0620305801RI	IODINE-129	-2.70E-02	(U)	2.68E-01	5.15E-01
E0620305802RI	IODINE-129	-8.53E-02	(U)	2.71E-01	5.12E-01
E0620305901RI	IODINE-129	-2.16E-01	(U)	3.02E-01	5.44E-01
E0620306001RI	IODINE-129	-1.15E-01	(U)	2.50E-01	4.65E-01
E0620306101RI	IODINE-129	1.84E-01	(U)	2.51E-01	5.25E-01
E0620306201RI	IODINE-129	-3.90E-01	(U)	2.95E-01	4.97E-01
E0620306301RI	IODINE-129	-2.11E-01	(U)	2.66E-01	4.74E-01
E0620306401RI	IODINE-129	2.91E-01	(U)	4.03E-01	8.03E-01
E0620306501RI	IODINE-129	-2.07E-01	(U)	2.29E-01	4.04E-01

Table B-1. (continued).

Sample ID	Radionuclide	Sample Value (pCi/g)	Validation Flag	Sample Uncertainty (pCi/g)	MDA[a] (pCi/g)
E0620306601RI	IODINE-129	-9.66E-02	(U)	2.31E-01	4.35E-01
E0620306701RI	IODINE-129	4.26E-01	(U)	2.93E-01	6.30E-01
E0620306801RI	IODINE-129	4.35E-01	(UJ)	2.02E-01	4.90E-01
E0620306802RI	IODINE-129	1.85E-01	(U)	2.65E-01	5.49E-01
E0620306901RI	IODINE-129	4.25E-01	(UJ)	1.92E-01	4.23E-01
E0620307001RI	IODINE-129	4.08E-01	(U)	2.04E-01	4.80E-01
E0620307101RI	IODINE-129	1.03E-01	(U)	2.90E-01	5.78E-01
E0620307201RI	IODINE-129	-8.64E-01	(U)	2.67E-01	5.32E-01
E0620307301RI	IODINE-129	5.40E-02	(U)	2.58E-01	5.13E-01
E0620307401RI	IODINE-129	2.46E-01	(U)	3.10E-01	6.36E-01
E0620307501RI	IODINE-129	1.66E-01	(U)	2.68E-01	5.51E-01
E0620307601RI	IODINE-129	-1.79E-01	(U)	2.98E-01	5.41E-01
E0620307701RI	IODINE-129	-1.85E-01	(U)	2.74E-01	4.93E-01
E0620307801RI	IODINE-129	9.41E-02	(U)	2.50E-01	5.07E-01
E0620307901RI	IODINE-129	5.45E-02	(U)	3.03E-01	5.92E-01
E0620308001RI	IODINE-129	1.79E-01	(U)	2.98E-01	6.07E-01
E0620308101RI	IODINE-129	2.72E-02	(U)	2.47E-01	4.87E-01
E0620308201RI	IODINE-129	1.20E-03	(U)	3.22E-01	6.20E-01
E0620308301RI	IODINE-129	2.23E-01	(U)	2.12E-01	4.67E-01
E0620308401RI	IODINE-129	-3.25E-01	(U)	2.88E-01	5.00E-01
E0620308501RI	IODINE-129	-2.39E-01	(U)	2.79E-01	4.96E-01
E0620308601RI	IODINE-129	-2.83E-01	(U)	3.12E-01	5.49E-01
E0620308701RI	IODINE-129	1.43E-01	(U)	2.10E-01	4.46E-01
E0620308801RI	IODINE-129	1.97E-01	(U)	2.08E-01	5.43E-01
E0620308901RI	IODINE-129	2.29E-01	(U)	3.20E-01	6.54E-01
E0620309001RI	IODINE-129	3.63E-01	(U)	2.75E-01	5.96E-01
E0620309101RI	IODINE-129	4.15E-02	(U)	2.60E-01	5.15E-01
E0620309201RI	IODINE-129	2.65E-01	(U)	2.26E-01	4.98E-01
E0620309301RI	IODINE-129	2.16E-02	(U)	3.17E-01	6.15E-01
E0620309401RI	IODINE-129	-6.00E-01	(U)	2.36E-01	4.91E-01
E0620309501RI	IODINE-129	3.60E-02	(U)	2.87E-01	5.62E-01
E0620309601RI	IODINE-129	3.88E-01	(U)	2.31E-01	5.24E-01
E0620309701RI	IODINE-129	-7.05E-01	(U)	3.34E-01	5.18E-01
E0620309801RI	IODINE-129	2.75E-01	(U)	2.24E-01	4.98E-01
E0620309901RI	IODINE-129	8.66E-01	(UJ)	2.78E-01	7.58E-01
E0620310001RI	IODINE-129	-8.20E-02	(U)	1.87E-01	5.08E-01
E0620310101RI	IODINE-129	1.96E-01	(U)	2.91E-01	5.98E-01

Table B-1. (continued).

Sample ID	Radionuclide	Sample Value (pCi/g)	Validation Flag	Sample Uncertainty (pCi/g)	MDA[a] (pCi/g)
E0620310201RI	IODINE-129	2.18E-01	(U)	2.11E-01	4.68E-01
E0620310202RI	IODINE-129	-1.05E-01	(U)	2.59E-01	4.83E-01
E0620310301RI	IODINE-129	-7.29E-02	(U)	2.81E-01	5.31E-01
E0620310401RI	IODINE-129	2.38E-01	(U)	2.99E-01	6.16E-01
E0620310501RI	IODINE-129	-2.23E-01	(U)	2.70E-01	4.84E-01
E0620310601RI	IODINE-129	-2.62E-01	(U)	2.94E-01	5.19E-01
E0620310602RI	IODINE-129	2.35E-01	(U)	2.10E-01	4.69E-01
E0620310701RI	IODINE-129	3.77E-01	(U)	2.71E-01	5.90E-01
E0620310801RI	IODINE-129	-9.22E-02	(U)	3.04E-01	5.70E-01
E0620310901RI	IODINE-129	2.15E-01	(U)	1.96E-01	4.34E-01
E0620311001RI	IODINE-129	6.88E-02	(U)	2.56E-01	5.11E-01
E0620311101RI	IODINE-129	1.91E-01	(U)	2.28E-01	4.87E-01
E0620311201RI	IODINE-129	2.27E-01	(U)	2.35E-01	5.03E-01
E0620311301RI	IODINE-129	1.27E-01	(U)	2.87E-01	5.77E-01
E0620311401RI	IODINE-129	2.57E-02	(U)	2.36E-01	4.69E-01
E0620311501RI	IODINE-129	3.76E-01	(U)	1.97E-01	3.83E-01
E0620311601RI	IODINE-129	3.27E-01	(U)	1.96E-01	5.39E-01
E0620311701RI	IODINE-129	1.36E-01	(U)	2.53E-01	5.18E-01
E0620311801RI	IODINE-129	3.59E-01	(UJ)	1.49E-01	3.18E-01
E0620311901RI	IODINE-129	3.32E-01	(U)	2.57E-01	5.57E-01
E0620312001RI	IODINE-129	2.01E-01	(U)	3.04E-01	6.15E-01
E0620312101RI	IODINE-129	6.80E-02	(U)	3.01E-01	5.93E-01
E0620312201RI	IODINE-129	1.33E-01	(U)	2.09E-01	4.41E-01
E0620312301RI	IODINE-129	5.12E-02	(U)	2.70E-01	5.34E-01
E0620312401RI	IODINE-129	-2.64E-01	(U)	3.29E-01	5.89E-01
E0620312501RI	IODINE-129	-8.56E-02	(U)	2.74E-01	5.16E-01
E0620312502RI	IODINE-129	7.59E-02	(U)	3.16E-01	6.21E-01
E0620312601RI	IODINE-129	3.65E-03	(U)	2.73E-01	5.30E-01
E0620312701RI	IODINE-129	2.03E-01	(U)	3.02E-01	6.17E-01
E0620312801RI	IODINE-129	4.37E-01	(U)	2.23E-01	5.24E-01
E0620312901RI	IODINE-129	-6.96E-02	(U)	2.44E-01	5.86E-01
E0620313001RI	IODINE-129	-8.57E-02	(U)	3.12E-01	5.85E-01
E0620313101RI	IODINE-129	4.15E-02	(U)	2.81E-01	5.53E-01
E0620313201RI	IODINE-129	4.10E-01	(U)	3.13E-01	6.65E-01
E0620313301RI	IODINE-129	2.83E-01	(U)	2.67E-01	5.66E-01
E0620313401RI	IODINE-129	1.15E-01	(U)	2.67E-01	5.38E-01
E0620313501RI	IODINE-129	3.44E-01	(U)	2.56E-01	5.61E-01

Table B-1. (continued).

Sample ID	Radionuclide	Sample Value (pCi/g)	Validation Flag	Sample Uncertainty (pCi/g)	MDA[a] (pCi/g)
E0620313601RI	IODINE-129	2.84E-01	(U)	2.50E-01	5.38E-01
E0620313602RI	IODINE-129	-1.03E-01	(U)	3.14E-01	5.87E-01
E0620313701RI	IODINE-129	1.63E-01	(U)	2.55E-01	5.28E-01
E0620313801RI	IODINE-129	1.28E-01	(U)	2.66E-01	5.38E-01
E0620313901RI	IODINE-129	4.51E-01	(U)	2.42E-01	5.48E-01
E0620314001RI	IODINE-129	1.88E-01	(U)	2.22E-01	5.31E-01
E0620314101RI	IODINE-129	1.38E-01	(U)	2.85E-01	5.74E-01
E0620314201RI	IODINE-129	5.15E-01	(U)	3.09E-01	5.52E-01
E0620314301RI	IODINE-129	-1.62E-01	(U)	3.27E-01	6.00E-01
E0620314401RI	IODINE-129	1.53E-01	(U)	2.35E-01	4.90E-01
E0620314501RI	IODINE-129	1.18E-01	(U)	2.83E-01	5.67E-01
E0620314601RI	IODINE-129	2.08E-01	(U)	2.96E-01	6.05E-01
E0620314701RI	IODINE-129	3.76E-01	(U)	2.47E-01	5.52E-01
E0620314801RI	IODINE-129	1.98E-01	(U)	2.71E-01	5.58E-01
E0620314901RI	IODINE-129	3.33E-01	(U)	2.76E-01	5.91E-01
E0620315001RI	IODINE-129	5.19E-02	(U)	2.92E-01	5.75E-01
E0620315101RI	IODINE-129	8.14E-01	(UJ)	2.39E-01	6.10E-01
E0620315201RI	IODINE-129	1.31E-01	(U)	2.94E-01	5.90E-01
E0620315301RI	IODINE-129	-2.63E-01	(U)	3.01E-01	5.44E-01
E0620315401RI	IODINE-129	3.40E-01	(U)	2.86E-01	6.12E-01
E0620315501RI	IODINE-129	-2.44E-02	(U)	3.25E-01	6.18E-01
E0620315601RI	IODINE-129	2.50E-01	(U)	2.32E-01	5.03E-01
E0620315701RI	IODINE-129	-3.13E-01	(U)	3.20E-01	5.60E-01
E0620315801RI	IODINE-129	3.90E-01	(UJ)	1.78E-01	4.49E-01
E0620315901RI	IODINE-129	-1.67E-01	(U)	3.31E-01	6.06E-01
E0620315902RI	IODINE-129	4.75E-01	(U)	2.62E-01	5.90E-01
E0620316001RI	IODINE-129	4.39E-01	(UJ)	1.79E-01	4.63E-01
E0620316101RI	IODINE-129	-1.35E-01	(U)	2.35E-01	4.34E-01
E0620316201RI	IODINE-129	1.37E-01	(U)	2.36E-01	4.89E-01
E0620316301RI	IODINE-129	4.26E-01	(U)	2.43E-01	5.49E-01
E0620316401RI	IODINE-129	3.11E-01	(U)	2.35E-01	5.14E-01
E0620316501RI	IODINE-129	7.37E-02	(U)	2.60E-01	5.20E-01
E0620316601RI	IODINE-129	6.30E-01	(UJ)	2.58E-01	5.98E-01
E0620316701RI	IODINE-129	4.63E-02	(U)	2.95E-01	5.77E-01
E0620316801RI	IODINE-129	2.50E-01	(U)	2.40E-01	5.16E-01
E0620316901RI	IODINE-129	2.97E-01	(U)	1.71E-01	4.07E-01
E0620317001RI	IODINE-129	2.80E-01	(U)	3.23E-01	6.61E-01

Table B-1. (continued).

Sample ID	Radionuclide	Sample Value (pCi/g)	Validation Flag	Sample Uncertainty (pCi/g)	MDA[a] (pCi/g)
E0620317101RI	IODINE-129	6.99E-01	(UJ)	2.00E-01	5.30E-01
E0620317201RI	IODINE-129	-1.72E-01	(U)	2.37E-01	4.36E-01
E0620317301RI	IODINE-129	-1.74E-02	(U)	2.70E-01	5.25E-01
E0620317401RI	IODINE-129	4.68E-01	(UJ)	1.91E-01	4.72E-01
E0620317501RI	IODINE-129	2.34E-01	(U)	2.46E-01	5.21E-01
E0620317601RI	IODINE-129	1.31E-02	(U)	2.62E-01	5.11E-01
E0620317701RI	IODINE-129	2.87E-01	(U)	2.40E-01	5.19E-01
E0620317702RI	IODINE-129	3.24E-01	(U)	2.99E-01	6.27E-01
E0620317801RI	IODINE-129	2.28E-02	(U)	2.49E-01	4.91E-01
E0620317901RI	IODINE-129	4.00E-01	(U)	2.66E-01	5.80E-01
E0620318001RI	IODINE-129	2.51E-01	(U)	2.59E-01	5.47E-01
E0620318101RI	IODINE-129	3.15E-01	(U)	2.51E-01	5.49E-01
E0620318201RI	IODINE-129	3.51E-01	(U)	2.76E-01	5.92E-01
E0620318301RI	IODINE-129	4.15E-01	(U)	2.81E-01	6.14E-01
E0620318302RI	IODINE-129	-6.75E-02	(U)	2.75E-01	5.19E-01
E0620318401RI	IODINE-129	2.95E-01	(UJ)	1.43E-01	3.99E-01
E0620318501RI	IODINE-129	1.07E-01	(U)	2.39E-01	4.89E-01
E0620318601RI	IODINE-129	3.71E-01	(U)	2.23E-01	5.19E-01
E0620318701RI	IODINE-129	3.15E-01	(U)	2.54E-01	5.49E-01
E0620322201RI	IODINE-129	3.28E-01	(U)	2.02E-01	4.68E-01
E0620322301RI	IODINE-129	4.13E-01	(U)	2.39E-01	5.43E-01
E0620322401RI	IODINE-129	-3.27E-01	(U)	3.43E-01	6.07E-01
E0620322501RI	IODINE-129	-5.35E-02	(U)	2.44E-01	4.68E-01
E0620322601RI	IODINE-129	3.24E-01	(U)	2.06E-01	5.54E-01
E0620322701RI	IODINE-129	2.30E-01	(U)	2.53E-01	5.35E-01
E0620323001RI	IODINE-129	-1.35E-01	(U)	2.95E-01	5.49E-01
E0620323301RI	IODINE-129	6.15E-01	(UJ)	2.57E-01	4.95E-01
E0620323401RI	IODINE-129	6.75E-01	(UJ)	2.50E-01	5.98E-01
E0620323501RI	IODINE-129	2.19E-01	(U)	2.73E-01	5.67E-01
E0620323601RI	IODINE-129	1.56E-01	(U)	2.63E-01	5.39E-01

J = analysis performed and radioactivity detected. Concentrations are less than the decision level and greater than the minimum detectable concentration associated with the sample results.

U = nondetect.

UJ = false positive due to concentrations less than the decision level and the minimum detectable concentration associated with the sample result.

a. MDA = minimum detectable activity.

Table B-2. ESP-106-04 verification resample results for I-129.

Sample ID	Radionuclide	Sample Value (pCi/g)	Validation Flag	Sample Uncertainty (pCi/g)	MDA[a] (pCi/g)
E1060400001RI	IODINE-129	1.86E+00		3.75E-01	7.71E-01
E1060400101RI	IODINE-129	3.79E+00		4.80E-01	1.02E+00
E1060400201RI	IODINE-129	6.10E+00		7.14E-01	1.26E+00
E1060400301RI	IODINE-129	2.21E+00		4.29E-01	5.51E-01
E1060400401RI	IODINE-129	1.16E+00		3.75E-01	4.98E-01
E1060400501RI	IODINE-129	7.26E+00		6.79E-01	7.65E-01
E1060400601RI	IODINE-129	1.10E+01		8.47E-01	5.29E-01
E1060400701RI	IODINE-129	1.09E+00		2.89E-01	5.00E-01
E1060400801RI	IODINE-129	3.16E-01	(U)	3.08E-01	6.41E-01
E1060400901RI	IODINE-129	2.31E+00		4.77E-01	6.88E-01
E1060400902RI	IODINE-129	1.91E+00		4.43E-01	7.82E-01
E1060401001RI	IODINE-129	6.89E-01	(J)	3.06E-01	4.55E-01
E1060401101RI	IODINE-129	5.70E-01	(J)	2.79E-01	4.68E-01
E1060401201RI	IODINE-129	1.31E+00		3.87E-01	6.34E-01
E1060401301RI	IODINE-129	4.38E+00		6.52E-01	9.51E-01
E1060401401RI	IODINE-129	-1.69E-01	(U)	3.36E-01	6.22E-01
E1060401501RI	IODINE-129	7.60E-01	(J)	3.50E-01	6.24E-01
E1060401601RI	IODINE-129	1.73E+00		3.44E-01	4.87E-01
E1060401701RI	IODINE-129	5.14E-01	(U)	2.67E-01	5.25E-01
E1060401801RI	IODINE-129	9.08E-01	(J)	3.09E-01	5.39E-01
E1060401901RI	IODINE-129	6.90E-01		1.96E-01	5.60E-01
E1060402001RI	IODINE-129	3.11E+00		4.94E-01	8.55E-01
E1060402101RI	IODINE-129	8.13E-01	(J)	3.04E-01	6.33E-01
E1060402201RI	IODINE-129	1.02E+00	(J)	3.56E-01	5.58E-01
E1060402301RI	IODINE-129	1.17E-01	(U)	3.22E-01	6.39E-01
E1060402302RI	IODINE-129	1.58E-01	(U)	3.29E-01	6.58E-01
E1060402401RI	IODINE-129	1.27E+00		3.55E-01	5.15E-01
E1060402501RI	IODINE-129	2.65E-01	(U)	2.24E-01	5.88E-01
E1060402601RI	IODINE-129	2.52E-02	(U)	3.77E-01	7.20E-01
E1060402701RI	IODINE-129	-3.87E-01	(U)	4.52E-01	7.99E-01
E1060402801RI	IODINE-129	4.31E-01	(U)	3.19E-01	4.61E-01
E1060402901RI	IODINE-129	4.22E-01	(U)	2.82E-01	6.10E-01
E1060403001RI	IODINE-129	-2.23E-01	(U)	3.33E-01	6.03E-01
E1060403101RI	IODINE-129	1.32E-01	(U)	3.31E-01	6.55E-01
E1060403201RI	IODINE-129	7.00E-01	(J)	2.88E-01	5.72E-01
E1060403301RI	IODINE-129	6.16E-01	(J)	3.06E-01	5.29E-01
E1060403401RI	IODINE-129	9.70E+00		8.72E-01	7.52E-01

Table B-2. (continued).

Sample ID	Radionuclide	Sample Value (pCi/g)	Validation Flag	Sample Uncertainty (pCi/g)	MDA[a] (pCi/g)
E1060403501RI	IODINE-129	4.00E-01	(U)	3.38E-01	7.04E-01
E1060403502RI	IODINE-129	5.94E-01	(U)	3.79E-01	7.96E-01
E1060403601RI	IODINE-129	9.13E-01	(J)	3.24E-01	5.93E-01
E1060403701RI	IODINE-129	2.23E+00		3.59E-01	5.92E-01
E1060403801RI	IODINE-129	8.35E-01	(J)	2.85E-01	4.81E-01
E1060403901RI	IODINE-129	2.97E-01	(U)	2.91E-01	6.10E-01
E1060404001RI	IODINE-129	1.94E+00		3.36E-01	7.59E-01
E1060404101RI	IODINE-129	1.98E-01	(U)	3.30E-01	6.60E-01
E1060404201RI	IODINE-129	1.46E+00		4.23E-01	5.84E-01
E1060404301RI	IODINE-129	5.57E-02	(U)	2.87E-01	5.66E-01
E1060404401RI	IODINE-129	3.14E+00		4.03E-01	6.33E-01
E1060404501RI	IODINE-129	6.05E-01	(J)	2.94E-01	5.24E-01
E1060404601RI	IODINE-129	6.89E+00		6.33E-01	6.73E-01
E1060404701RI	IODINE-129	-1.03E-01	(U)	2.80E-01	5.26E-01
E1060404801RI	IODINE-129	5.52E-01	(U)	2.80E-01	6.33E-01
E1060404901RI	IODINE-129	1.06E+00		3.02E-01	5.58E-01
E1060405001RI	IODINE-129	2.05E-01	(U)	2.46E-01	5.20E-01
E1060405101RI	IODINE-129	5.89E-01	(UJ)	2.79E-01	6.35E-01
E1060405201RI	IODINE-129	3.93E-01	(UJ)	1.67E-01	4.84E-01
E1060405301RI	IODINE-129	1.77E-01	(U)	1.99E-01	5.22E-01
E1060405401RI	IODINE-129	9.18E-01		2.65E-01	4.16E-01
E1060405501RI	IODINE-129	2.09E+00		4.15E-01	6.79E-01
E1060405601RI	IODINE-129	4.89E-01	(U)	2.89E-01	6.38E-01
E1060405701RI	IODINE-129	2.30E-01	(U)	2.77E-01	5.77E-01
E1060405801RI	IODINE-129	2.01E+00		4.24E-01	7.77E-01
E1060405901RI	IODINE-129	1.41E+00		3.37E-01	5.25E-01
E1060406001RI	IODINE-129	3.41E+00		4.29E-01	6.95E-01
E1060406101RI	IODINE-129	5.08E+00		6.23E-01	1.01E+00
E1060406201RI	IODINE-129	1.72E+00		3.44E-01	6.39E-01
E1060406301RI	IODINE-129	3.22E-01	(U)	3.28E-01	6.79E-01
E1060406401RI	IODINE-129	6.57E+00		7.91E-01	1.12E+00
E1060406501RI	IODINE-129	7.72E-01		2.20E-01	4.29E-01
E1060406502RI	IODINE-129	6.51E-01		1.57E-01	5.08E-01

J = analysis performed and radioactivity detected. Concentrations are less than the decision level and greater than the minimum detectable concentration associated with the sample results.

U = nondetect.

UJ = false positive due to concentrations less than the decision level and the minimum detectable concentration associated with the sample result.

a. MDA = minimum detectable activity.

Table B-3. ESP-116-04 confirmatory sample results for radiological analytes from Pond 1.

Sample ID	Radionuclide	Sample Value (pCi/g)	Validation Flag	Sample Uncertainty (pCi/g)	MDA[a] (pCi/g)
E1160400001R4	SILVER-108M	5.11E-03	(U)	1.17E-02	4.32E-02
E1160400001R4	SILVER-110M	4.12E-02	(UJ)	1.55E-02	5.56E-02
E1160400001R4	CERIUM-144	-7.02E-02	(U)	8.80E-02	2.80E-01
E1160400001R4	COBALT-60	-3.29E-03	(U)	1.63E-02	5.94E-02
E1160400001R4	CESIUM-134	5.47E-02	(UJ)	2.06E-02	5.93E-02
E1160400001R4	CESIUM-137	4.07E-01		3.79E-02	5.23E-02
E1160400001R4	EUROPIUM-152	1.69E-03	(U)	3.63E-02	1.34E-01
E1160400001R4	EUROPIUM-154	-1.95E-02	(U)	5.14E-02	1.85E-01
E1160400001R4	EUROPIUM-155	5.37E-02	(U)	3.94E-02	1.50E-01
E1160400001R4	MANGANESE-54	2.77E-02	(U)	1.44E-02	5.59E-02
E1160400001R4	RUTHENIUM-106	7.73E-02	(U)	1.26E-01	4.76E-01
E1160400001R4	ANTIMONY-125	-6.26E-03	(U)	3.25E-02	1.17E-01
E1160400001R4	ZINC-65	1.06E-01	(UJ)	4.40E-02	1.51E-01
E1160400101R4	SILVER-108M	-1.25E-02	(U)	1.41E-02	5.24E-02
E1160400101R4	SILVER-110M	-5.64E-03	(U)	1.68E-02	5.30E-02
E1160400101R4	CERIUM-144	3.80E-02	(U)	7.67E-02	2.99E-01
E1160400101R4	COBALT-60	2.02E-02	(U)	1.75E-02	6.30E-02
E1160400101R4	CESIUM-134	4.86E-02	(UJ)	1.83E-02	6.73E-02
E1160400101R4	CESIUM-137	1.15E+00		7.74E-02	5.74E-02
E1160400101R4	EUROPIUM-152	3.90E-02	(U)	4.59E-02	1.51E-01
E1160400101R4	EUROPIUM-154	3.79E-03	(U)	4.61E-02	1.73E-01
E1160400101R4	EUROPIUM-155	7.59E-02	(U)	4.83E-02	1.37E-01
E1160400101R4	MANGANESE-54	2.36E-02	(U)	1.49E-02	5.78E-02
E1160400101R4	RUTHENIUM-106	-5.67E-02	(U)	1.30E-01	4.76E-01
E1160400101R4	ANTIMONY-125	1.54E-02	(U)	4.09E-02	1.49E-01
E1160400101R4	ZINC-65	-6.97E-02	(U)	3.62E-02	1.24E-01
E1160400201R4	SILVER-108M	-5.44E-03	(U)	9.98E-03	3.75E-02
E1160400201R4	SILVER-110M	1.12E-02	(U)	1.15E-02	3.92E-02
E1160400201R4	CERIUM-144	9.18E-02	(U)	7.43E-02	2.56E-01
E1160400201R4	COBALT-60	1.73E-02	(U)	1.27E-02	5.02E-02
E1160400201R4	CESIUM-134	5.66E-02	(UJ)	1.37E-02	5.30E-02
E1160400201R4	CESIUM-137	8.30E-01		4.92E-02	4.34E-02
E1160400201R4	EUROPIUM-152	-2.28E-02	(U)	2.80E-02	1.07E-01
E1160400201R4	EUROPIUM-154	3.79E-02	(U)	2.60E-02	1.30E-01
E1160400201R4	EUROPIUM-155	1.40E-02	(U)	3.54E-02	1.40E-01
E1160400201R4	MANGANESE-54	3.37E-02	(UJ)	1.19E-02	3.87E-02
E1160400201R4	RUTHENIUM-106	-2.36E-02	(U)	9.71E-02	3.57E-01
E1160400201R4	ANTIMONY-125	-2.59E-02	(U)	2.85E-02	1.06E-01
E1160400201R4	ZINC-65	-3.92E-02	(U)	3.09E-02	9.15E-02

Table B-3. (continued).

Sample ID	Radionuclide	Sample Value (pCi/g)	Validation Flag	Sample Uncertainty (pCi/g)	MDA[a] (pCi/g)
E1160400301R4	SILVER-108M	-2.35E-03	(U)	8.30E-03	3.18E-02
E1160400301R4	SILVER-110M	-9.13E-03	(U)	1.13E-02	3.49E-02
E1160400301R4	CERIUM-144	-7.52E-03	(U)	5.73E-02	2.26E-01
E1160400301R4	COBALT-60	-1.21E-03	(U)	1.20E-02	3.84E-02
E1160400301R4	CESIUM-134	4.63E-02	(J)	1.33E-02	5.43E-02
E1160400301R4	CESIUM-137	2.89E-01		2.87E-02	3.79E-02
E1160400301R4	EUROPIUM-152	4.58E-02	(U)	2.97E-02	1.13E-01
E1160400301R4	EUROPIUM-154	3.22E-02	(U)	4.33E-02	1.45E-01
E1160400301R4	EUROPIUM-155	4.68E-02	(U)	2.93E-02	1.21E-01
E1160400301R4	MANGANESE-54	1.28E-02	(U)	1.21E-02	3.60E-02
E1160400301R4	RUTHENIUM-106	-9.91E-03	(U)	8.49E-02	3.17E-01
E1160400301R4	ANTIMONY-125	-2.26E-02	(U)	2.57E-02	9.60E-02
E1160400301R4	ZINC-65	-5.69E-02	(U)	3.29E-02	9.31E-02
E1160400401R4	SILVER-108M	-8.60E-03	(U)	1.65E-02	5.86E-02
E1160400401R4	SILVER-110M	1.62E-01	(UJ)	2.09E-02	7.95E-02
E1160400401R4	CERIUM-144	3.22E-02	(U)	7.36E-02	2.77E-01
E1160400401R4	COBALT-60	2.52E-02	(U)	1.54E-02	6.12E-02
E1160400401R4	CESIUM-134	1.05E-01	(UJ)	2.10E-02	5.47E-02
E1160400401R4	CESIUM-137	5.21E+00		2.55E-01	5.18E-02
E1160400401R4	EUROPIUM-152	6.38E-02	(U)	4.14E-02	1.58E-01
E1160400401R4	EUROPIUM-154	1.68E-02	(U)	4.11E-02	1.55E-01
E1160400401R4	EUROPIUM-155	4.15E-02	(U)	3.65E-02	1.27E-01
E1160400401R4	MANGANESE-54	3.25E-02	(U)	2.51E-02	5.09E-02
E1160400401R4	RUTHENIUM-106	1.13E-01	(U)	9.30E-02	4.21E-01
E1160400401R4	ANTIMONY-125	4.21E-02	(U)	4.58E-02	1.69E-01
E1160400401R4	ZINC-65	-2.49E-02	(U)	3.76E-02	1.15E-01
E1160400501R4	SILVER-108M	3.80E-03	(U)	1.28E-02	4.77E-02
E1160400501R4	SILVER-110M	1.15E-02	(U)	1.37E-02	4.71E-02
E1160400501R4	CERIUM-144	-7.67E-02	(U)	8.65E-02	3.18E-01
E1160400501R4	COBALT-60	7.23E-03	(U)	1.46E-02	5.58E-02
E1160400501R4	CESIUM-134	8.28E-02	(UJ)	3.07E-02	6.68E-02
E1160400501R4	CESIUM-137	3.37E-02	(UJ)	1.48E-02	5.76E-02
E1160400501R4	EUROPIUM-152	4.62E-02	(U)	3.90E-02	1.51E-01
E1160400501R4	EUROPIUM-154	3.24E-02	(U)	4.49E-02	1.72E-01
E1160400501R4	EUROPIUM-155	7.58E-02	(U)	4.53E-02	1.78E-01
E1160400501R4	MANGANESE-54	-2.19E-03	(U)	1.44E-02	5.26E-02
E1160400501R4	RUTHENIUM-106	-2.19E-01	(U)	1.19E-01	4.21E-01
E1160400501R4	ANTIMONY-125	-3.72E-02	(U)	3.70E-02	1.32E-01
E1160400501R4	ZINC-65	4.68E-04	(U)	4.04E-02	1.24E-01
E1160400601R4	SILVER-108M	5.11E-03	(U)	1.19E-02	4.40E-02

Table B-3. (continued).

Sample ID	Radionuclide	Sample Value (pCi/g)	Validation Flag	Sample Uncertainty (pCi/g)	MDA[a] (pCi/g)
E1160400601R4	SILVER-110M	1.88E-03	(U)	1.20E-02	4.50E-02
E1160400601R4	CERIUM-144	-1.99E-01	(U)	7.51E-02	2.57E-01
E1160400601R4	COBALT-60	1.52E-02	(U)	1.37E-02	5.41E-02
E1160400601R4	CESIUM-134	6.71E-02	(UJ)	1.81E-02	5.89E-02
E1160400601R4	CESIUM-137	2.40E-03	(U)	1.25E-02	4.72E-02
E1160400601R4	EUROPIUM-152	-1.31E-02	(U)	3.40E-02	1.25E-01
E1160400601R4	EUROPIUM-154	6.57E-03	(U)	4.40E-02	1.64E-01
E1160400601R4	EUROPIUM-155	2.25E-02	(U)	3.77E-02	1.44E-01
E1160400601R4	MANGANESE-54	1.93E-02	(U)	1.29E-02	5.25E-02
E1160400601R4	RUTHENIUM-106	-6.09E-02	(U)	1.05E-01	3.87E-01
E1160400601R4	ANTIMONY-125	1.70E-02	(U)	3.20E-02	1.19E-01
E1160400601R4	ZINC-65	5.77E-02	(U)	4.18E-02	1.37E-01
E1160400701R4	SILVER-108M	-2.44E-02	(U)	1.52E-02	5.53E-02
E1160400701R4	SILVER-110M	1.30E-01	(UJ)	1.82E-02	7.32E-02
E1160400701R4	CERIUM-144	7.89E-02	(U)	8.26E-02	3.27E-01
E1160400701R4	COBALT-60	1.11E-01		2.10E-02	5.42E-02
E1160400701R4	CESIUM-134	1.18E-01	(UJ)	2.14E-02	6.39E-02
E1160400701R4	CESIUM-137	5.00E+00		7.86E-02	5.10E-02
E1160400701R4	EUROPIUM-152	8.00E-02	(U)	4.18E-02	1.61E-01
E1160400701R4	EUROPIUM-154	-1.10E-02	(U)	4.21E-02	1.54E-01
E1160400701R4	EUROPIUM-155	4.17E-03	(U)	4.19E-02	1.67E-01
E1160400701R4	MANGANESE-54	9.53E-03	(U)	1.24E-02	4.68E-02
E1160400701R4	RUTHENIUM-106	-1.25E-01	(U)	1.16E-01	4.15E-01
E1160400701R4	ANTIMONY-125	1.64E-02	(U)	4.64E-02	1.65E-01
E1160400701R4	ZINC-65	1.74E-02	(U)	3.57E-02	1.19E-01
E1160400001RI	IODINE-129	1.94E-01	(U)	1.71E-01	4.62E-01
E1160400101RI	IODINE-129	4.83E-01	(U)	3.29E-01	4.91E-01
E1160400201RI	IODINE-129	4.32E-01	(UJ)	2.13E-01	4.29E-01
E1160400301RI	IODINE-129	-9.00E-03	(U)	1.54E-01	3.89E-01
E1160400401RI	IODINE-129	-2.97E-01	(U)	2.55E-01	5.79E-01
E1160400501RI	IODINE-129	-7.91E-02	(U)	1.91E-01	4.60E-01
E1160400601RI	IODINE-129	4.16E-01	(UJ)	1.74E-01	5.77E-01
E1160400701RI	IODINE-129	1.02E+00	(UJ)	3.06E-01	5.30E-01

J = analysis performed and radioactivity detected. Concentrations are less than the decision level and greater than the minimum detectable concentration associated with the sample results.

U = nondetect.

UJ = false positive due to concentrations less than the decision level and the minimum detectable concentration associated with the sample result.

a. MDA = minimum detectable activity.

Table B-4. ESP-116-04 confirmatory sample results for radiological analytes from Pond 2.

Sample ID	Radionuclide	Sample Value (pCi/g)	Validation Flag	Sample Uncertainty (pCi/g)	MDA[a] (pCi/g)
E1160400801R4	SILVER-108M	-5.90E-03	(U)	1.31E-02	4.92E-02
E1160400801R4	SILVER-110M	-3.14E-03	(U)	1.63E-02	5.21E-02
E1160400801R4	CERIUM-144	-7.85E-02	(U)	8.78E-02	2.91E-01
E1160400801R4	COBALT-60	3.61E-03	(U)	1.67E-02	6.27E-02
E1160400801R4	CESIUM-134	4.07E-02	(UJ)	1.69E-02	6.73E-02
E1160400801R4	CESIUM-137	8.26E-01		6.24E-02	5.47E-02
E1160400801R4	EUROPIUM-152	-4.14E-02	(U)	3.89E-02	1.38E-01
E1160400801R4	EUROPIUM-154	2.47E-02	(U)	4.77E-02	1.82E-01
E1160400801R4	EUROPIUM-155	7.66E-02	(U)	3.99E-02	1.37E-01
E1160400801R4	MANGANESE-54	2.98E-02	(U)	1.54E-02	6.03E-02
E1160400801R4	RUTHENIUM-106	-2.48E-01	(U)	1.36E-01	4.69E-01
E1160400801R4	ANTIMONY-125	-2.92E-02	(U)	4.12E-02	1.45E-01
E1160400801R4	ZINC-65	-5.33E-02	(U)	4.45E-02	1.33E-01
E1160400901R4	SILVER-108M	2.01E-02	(U)	1.10E-02	4.21E-02
E1160400901R4	SILVER-110M	-1.21E-03	(U)	1.48E-02	4.72E-02
E1160400901R4	CERIUM-144	-1.36E-01	(U)	6.77E-02	2.50E-01
E1160400901R4	COBALT-60	4.05E-03	(U)	1.31E-02	4.93E-02
E1160400901R4	CESIUM-134	1.87E-02	(U)	1.64E-02	5.54E-02
E1160400901R4	CESIUM-137	1.33E-01		2.15E-02	4.80E-02
E1160400901R4	EUROPIUM-152	-4.34E-02	(U)	3.32E-02	1.23E-01
E1160400901R4	EUROPIUM-154	-2.97E-02	(U)	4.54E-02	1.60E-01
E1160400901R4	EUROPIUM-155	4.06E-02	(U)	3.48E-02	1.40E-01
E1160400901R4	MANGANESE-54	-1.27E-02	(U)	1.29E-02	4.70E-02
E1160400901R4	RUTHENIUM-106	5.63E-02	(U)	1.01E-01	3.84E-01
E1160400901R4	ANTIMONY-125	-9.11E-03	(U)	3.14E-02	1.18E-01
E1160400901R4	ZINC-65	2.28E-02	(U)	3.69E-02	1.22E-01
E1160401001R4	SILVER-108M	-9.05E-03	(U)	1.02E-02	3.77E-02
E1160401001R4	SILVER-110M	-8.97E-03	(U)	1.18E-02	3.62E-02
E1160401001R4	CERIUM-144	2.76E-03	(U)	6.65E-02	2.54E-01
E1160401001R4	COBALT-60	-1.01E-03	(U)	1.19E-02	4.42E-02
E1160401001R4	CESIUM-134	8.30E-02	(UJ)	2.61E-02	6.15E-02
E1160401001R4	CESIUM-137	1.99E-01		3.01E-02	3.88E-02
E1160401001R4	EUROPIUM-152	-3.34E-02	(U)	2.83E-02	1.05E-01
E1160401001R4	EUROPIUM-154	-2.73E-02	(U)	4.06E-02	1.44E-01
E1160401001R4	EUROPIUM-155	9.53E-02	(UJ)	4.58E-02	1.35E-01
E1160401001R4	MANGANESE-54	-1.69E-02	(U)	1.34E-02	4.51E-02
E1160401001R4	RUTHENIUM-106	-4.67E-02	(U)	9.40E-02	3.41E-01
E1160401001R4	ANTIMONY-125	-2.13E-02	(U)	2.81E-02	1.04E-01
E1160401001R4	ZINC-65	1.47E-02	(U)	3.24E-02	1.07E-01

Table B-4. (continued).

Sample ID	Radionuclide	Sample Value (pCi/g)	Validation Flag	Sample Uncertainty (pCi/g)	MDA[a] (pCi/g)
E1160401101R4	SILVER-108M	2.08E-02	(UJ)	8.71E-03	3.63E-02
E1160401101R4	SILVER-110M	1.47E-02	(U)	1.13E-02	3.95E-02
E1160401101R4	CERIUM-144	7.61E-03	(U)	5.42E-02	2.12E-01
E1160401101R4	COBALT-60	5.29E-03	(U)	1.34E-02	5.03E-02
E1160401101R4	CESIUM-134	1.78E-02	(U)	1.29E-02	4.94E-02
E1160401101R4	CESIUM-137	7.55E-02	(J)	3.11E-02	4.34E-02
E1160401101R4	EUROPIUM-152	-9.79E-03	(U)	2.87E-02	1.02E-01
E1160401101R4	EUROPIUM-154	-2.36E-02	(U)	3.86E-02	1.37E-01
E1160401101R4	EUROPIUM-155	9.62E-03	(U)	2.82E-02	1.12E-01
E1160401101R4	MANGANESE-54	1.01E-02	(U)	1.21E-02	4.51E-02
E1160401101R4	RUTHENIUM-106	-7.27E-03	(U)	9.41E-02	3.48E-01
E1160401101R4	ANTIMONY-125	-4.84E-02	(U)	2.75E-02	9.83E-02
E1160401101R4	ZINC-65	-5.32E-02	(U)	3.41E-02	9.68E-02
E1160401201R4	SILVER-108M	-6.81E-03	(U)	1.40E-02	4.99E-02
E1160401201R4	SILVER-110M	1.28E-02	(U)	1.57E-02	5.24E-02
E1160401201R4	CERIUM-144	-2.39E-02	(U)	6.56E-02	2.42E-01
E1160401201R4	COBALT-60	-5.74E-03	(U)	1.39E-02	5.03E-02
E1160401201R4	CESIUM-134	2.75E-02	(U)	1.91E-02	6.47E-02
E1160401201R4	CESIUM-137	9.77E-01		6.46E-02	5.16E-02
E1160401201R4	EUROPIUM-152	-1.53E-02	(U)	3.44E-02	1.26E-01
E1160401201R4	EUROPIUM-154	-2.75E-02	(U)	4.97E-02	1.77E-01
E1160401201R4	EUROPIUM-155	4.70E-02	(U)	3.04E-02	1.18E-01
E1160401201R4	MANGANESE-54	-7.89E-03	(U)	1.43E-02	5.10E-02
E1160401201R4	RUTHENIUM-106	1.77E-02	(U)	1.09E-01	4.12E-01
E1160401201R4	ANTIMONY-125	3.54E-02	(U)	3.74E-02	1.39E-01
E1160401201R4	ZINC-65	-5.84E-02	(U)	4.34E-02	1.27E-01
E1160401301R4	SILVER-108M	6.00E-03	(U)	1.33E-02	4.84E-02
E1160401301R4	SILVER-110M	8.33E-01	(UJ)	4.93E-02	1.12E-01
E1160401301R4	CERIUM-144	-3.22E-02	(U)	6.93E-02	2.63E-01
E1160401301R4	COBALT-60	2.09E-02	(UJ)	1.02E-02	3.96E-02
E1160401301R4	CESIUM-134	4.87E-02	(UJ)	1.61E-02	4.24E-02
E1160401301R4	CESIUM-137	6.92E+00		3.57E-01	3.63E-02
E1160401301R4	EUROPIUM-152	-1.55E-03	(U)	3.34E-02	1.24E-01
E1160401301R4	EUROPIUM-154	-1.23E-02	(U)	3.13E-02	1.12E-01
E1160401301R4	EUROPIUM-155	1.11E-01	(UJ)	4.05E-02	1.29E-01
E1160401301R4	MANGANESE-54	1.17E-02	(U)	9.95E-03	3.71E-02
E1160401301R4	RUTHENIUM-106	5.69E-02	(U)	9.08E-02	3.43E-01
E1160401301R4	ANTIMONY-125	-1.97E-02	(U)	3.62E-02	1.30E-01
E1160401301R4	ZINC-65	9.74E-02	(UJ)	2.83E-02	1.00E-01
E1160401401R4	SILVER-108M	1.33E-02	(U)	1.45E-02	5.46E-02

Table B-4. (continued).

Sample ID	Radionuclide	Sample Value (pCi/g)	Validation Flag	Sample Uncertainty (pCi/g)	MDA[a] (pCi/g)
E1160401401R4	SILVER-110M	3.09E-02	(UJ)	1.40E-02	5.13E-02
E1160401401R4	CERIUM-144	-3.22E-03	(U)	8.67E-02	3.26E-01
E1160401401R4	COBALT-60	-2.35E-02	(U)	1.38E-02	4.71E-02
E1160401401R4	CESIUM-134	9.15E-02	(UJ)	1.93E-02	6.36E-02
E1160401401R4	CESIUM-137	1.26E+00		4.45E-02	5.02E-02
E1160401401R4	EUROPIUM-152	-6.26E-04	(U)	4.12E-02	1.55E-01
E1160401401R4	EUROPIUM-154	-4.47E-02	(U)	4.55E-02	1.62E-01
E1160401401R4	EUROPIUM-155	7.85E-02	(U)	5.29E-02	1.71E-01
E1160401401R4	MANGANESE-54	-2.16E-02	(U)	1.41E-02	4.88E-02
E1160401401R4	RUTHENIUM-106	8.61E-03	(U)	1.15E-01	4.39E-01
E1160401401R4	ANTIMONY-125	-7.67E-04	(U)	4.01E-02	1.48E-01
E1160401401R4	ZINC-65	-4.93E-02	(U)	3.92E-02	1.11E-01
E1160401501R4	SILVER-108M	3.10E-03	(U)	2.14E-02	7.82E-02
E1160401501R4	SILVER-110M	1.15E-01	(UJ)	2.13E-02	7.77E-02
E1160401501R4	CERIUM-144	-7.84E-02	(U)	9.90E-02	3.63E-01
E1160401501R4	COBALT-60	2.37E-02	(U)	1.40E-02	5.57E-02
E1160401501R4	CESIUM-134	3.93E-02	(UJ)	1.45E-02	5.74E-02
E1160401501R4	CESIUM-137	1.30E+01		1.19E-01	5.70E-02
E1160401501R4	EUROPIUM-152	4.90E-02	(U)	5.48E-02	2.07E-01
E1160401501R4	EUROPIUM-154	6.77E-02	(U)	3.88E-02	1.55E-01
E1160401501R4	EUROPIUM-155	-1.81E-02	(U)	5.03E-02	1.89E-01
E1160401501R4	MANGANESE-54	2.82E-02	(UJ)	1.31E-02	4.23E-02
E1160401501R4	RUTHENIUM-106	-6.97E-02	(U)	1.66E-01	5.13E-01
E1160401501R4	ANTIMONY-125	1.70E-01	(UJ)	7.96E-02	2.29E-01
E1160401501R4	ZINC-65	2.52E-02	(U)	3.35E-02	1.12E-01
E1160400801RI	IODINE-129	-3.39E-01	(U)	1.92E-01	4.14E-01
E1160400901RI	IODINE-129	-2.02E-01	(U)	1.80E-01	4.12E-01
E1160401001RI	IODINE-129	-2.10E-03	(U)	1.72E-01	4.33E-01
E1160401101RI	IODINE-129	1.65E-01	(U)	2.01E-01	3.77E-01
E1160401201RI	IODINE-129	-6.79E-02	(U)	1.66E-01	4.05E-01
E1160401301RI	IODINE-129	-1.54E-02	(U)	2.66E-01	5.13E-01
E1160401401RI	IODINE-129	2.47E-01	(U)	2.03E-01	4.55E-01
E1160401501RI	IODINE-129	3.02E-01	(U)	2.91E-01	6.07E-01

J = analysis performed and radioactivity detected. Concentrations are less than the decision level and greater than the minimum detectable concentration associated with the sample results.

U = nondetect.

UJ = false positive due to concentrations less than the decision level and the minimum detectable concentration associated with the sample result.

a. MDA = minimum detectable activity.

Table B-5. ESP-116-04 confirmatory sample results for mercury from Pond 1.

Sample ID	Analyte	Sample Value (mg/kg)	Validation Flag
E1160400001HG	MERCURY	0.28	(J)
E1160400101HG	MERCURY	1.4	(J)
E1160400201HG	MERCURY	0.47	(J)
E1160400301HG	MERCURY	0.36	(J)
E1160400401HG	MERCURY	1.3	(J)
E1160400501HG	MERCURY	0.075	(J)
E1160400502HG	MERCURY	0.07	(J)
E1160400601HG	MERCURY	0.43	(J)
E1160400701HG	MERCURY	0.33	(J)

J = analysis performed and radioactivity detected. Concentrations are less than the decision level and greater than the minimum detectable concentration associated with the sample results.

Appendix C

HPGe Data

Appendix C

HPGe Data

Table C-1. East pond (Pond 1) HPGe data.

Easting[a]	Northing[a]	Elevation[b] (ft amsl)	Point	Cs-137	±2 Sigma
397.15	372.11	4902.271	ep1	1.5	0.1
397.87	312.77	4900.166	ep2	1.4	0.2
396.32	254.29	4902.906	ep3	1.8	0.1
393.02	197.23	4900.145	ep4	0.9	0.1
391.40	141.00	4903.344	ep5	0.9	0.1
391.39	69.32	4904.881	ep6	2.1	0.2
334.24	45.46	4903.175	ep7	1.1	0.1
335.57	104.16	4904.141	ep8	0.6	0.1
340.21	165.47	4903.453	ep9	0.5	0.1
341.22	225.14	4904.215	ep 10	0.7	0.1
338.59	275.95	4893.952	ep11	0.7	0.1
341.18	335.95	4899.522	ep12	0.9	0.1
337.56	391.35	4901.678	ep13	4.8	0.1
290.38	375.74	4902.471	ep1 4	0.1	0.1
289.25	315.33	4900.678	ep15	0.5	0.1
285.02	256.81	4899.512	ep16	0.6	0.1
281.58	205.27	4900.068	ep17	0.8	0.1
275.72	151.47	4902.216	ep18	0.4	0.1
273.11	90.65	4902.585	ep19	0.4	0.1
266.38	36.97	4905.543	ep20	2.2	0.1
216.30	42.19	4903.147	ep21	1.6	0.1
163.29	66.10	4906.862	ep22	0.9	0.1
107.12	37.01	4908.239	ep-23	2.9	0.1
53.71	41.50	4912.74	ep-24	0.4	0.1
47.11	97.91	4911.637	ep-25	1	0.1
106.94	100.24	4911.353	ep-26	1	0.1
171.33	104.65	4906.248	ep-27	0.5	0.1
236.21	105.83	4905.8	ep-28	0.9	0.1
238.08	163.09	4900.302	ep29	1.6	0.1
193.30	162.48	4903.379	ep30	2.5	0.1
133.14	158.88	4907.673	ep31	0.7	0.2
75.32	156.56	4907.842	ep32	3.2	0.2
38.07	215.92	4906.964	ep33	3.1	0.2
89.47	217.48	4904.664	ep34	2.7	0.1
155.81	219.61	4904.853	ep35	2.6	0.2
214.88	218.72	4903.169	ep36	2.6	0.2
229.02	276.40	4903.108	ep37	4.1	0.1

Table C-1. (continued).

Easting[a]	Northing[a]	Elevation[b] (ft amsl)	Point	Cs-137	±2 Sigma
165.82	280.33	4903.797	ep38	2.6	0.4
91.03	290.52	4900.48	ep39	0.6	0.2
62.86	346.97	4908.524	ep40	3.5	0.2
127.63	322.59	4900.982	ep41	0.5	0.1
195.10	328.06	4901.881	ep42	1	0.1
151.89	406.57	4910.092	ep43	2.1	0.2
231.94	411.02	4912.443	ep44	1.2	0.1
322.19	404.81	4910.819	ep45	1.8	0.4
429.73	403.42	4916.505	ep46	0.4	0.1
448.14	315.95	4906.458	ep47	3.5	0.1
446.13	212.46	4908.301	ep48	2.9	0.1
449.36	115.83	4911.064	ep49	2.1	0.1
417.46	27.58	4909.515	ep50	2.5	0.1
327.92	28.02	4908.8	ep51	0.9	0.1
228.10	29.48	4908.861	ep52	4.6	0.1
119.68	22.72	4913.563	ep53	6.3	0.1
40.82	35.34	4918.863	ep54	1.9	0.1
26.90	103.32	4913.74	ep55	0.9	0.1
26.94	190.31	4913.771	ep56	3.2	0.1
26.54	289.64	4910.948	ep58	1.4	0.1
29.26	362.00	4912.759	ep59	1.9	0.1
5.97	366.85	4923.043	ws1		
-0.05	256.47	4925.107	ws2		
2.45	151.21	4922.357	ws3		
18.80	13.30	4924.011	ws4		
74.61	0.00	4924.547	ss1		
203.00	1.25	4923.162	ss2		
317.56	2.50	4924.766	ss3		
459.54	9.49	4928.065	ss4		
477.72	93.71	4923.537	es1		
476.73	201.09	4920.802	es2		
475.00	306.88	4920.513	es3		
461.41	420.17	4920.852	es4		
383.01	430.62	4925.171	ns1		
277.53	434.12	4922.988	ns2		
155.27	436.48	4919.737	ns3		
19.78	423.63	4920.737	ns4		

a. Easting and northing coordinates are in feet and relative to the pond.
b. Elevations in feet and are NGVD 29 Vertical.
amsl = above mean sea level.

Table C-2. West pond (Pond 2) HPGe data.

Easting[a]	Northing[a]	Elevation[b] (ft amsl)	Comment	Cs-137	±2 Sigma	K-40	±2 Sigma
49.5	449.8	4902.625	PP1	1.5	0.02	15	0.6
79.4	391.6	4891.628	PP2	0.3	0.03	14.5	0.6
124.5	358.8	4900.891	PP3	0.3	0.02	14.4	0.6
171.2	319.7	4900.939	PP4	0.4	0.05	15.1	0.5
232.3	269.5	4901.727	PP5	1.3	0.05	15	0.7
300.5	217.2	4902.051	PP6	0.2	0.03	15.5	0.8
383.8	153.9	4902.468	PP7	0.5	0.03	15.3	0.7
469.7	90.2	4901.413	PP8	0.2	0.03	14.7	0.7
346.8	71.1	4897.971	PP9	0.5	0.02	17.2	0.5
180.2	62.1	4901.943	PP10	0.7	0.05	14.4	0.6
98.5	66.3	4899.058	PP11	0.4	0.04	14.8	0.6
166.8	127.6	4901.216	PP12	0.4	0.03	15.6	0.8
242.5	196.7	4898.663	PP13	0.2	0.03	14.2	0.7
336.6	277.0	4904.428	PP14	0.3	0.04	14.5	0.5
413.8	344.9	4907.986	PP15	0.9	0.02	14.2	0.3
489.3	427.0	4897.769	PP16	1.3	0.02	14.3	0.4
497.5	316.2	4899.537	PP17	0.9	0.02	13.3	0.3
497.6	207.3	4900.248	PP18	1.4	0.02	16.4	0.2
379.9	538.8	4912.4099	pp19	2.3	0.1	9.2	0.3
309.7	534.8	4912.2189	pp20	5.1	0.1	9.6	0.3
223.0	532.7	4911.4639	pp21	5.5	0.1	9.5	0.3
63.8	532.0	4910.5032	pp22	4.4	0.1	10	0.3
32.2	481.9	4910.928	pp23	2.6	0.1	10.1	0.5
33.8	337.9	4910.5096	pp24	3.6	0.1	9.5	0.2
34.8	192.2	4911.5364	pp25	6.5	0.1	9.6	0.3
33.0	53.3	4910.9102	pp26	0.5	0.1	9.7	0.3
71.8	25.0	4912.5878	pp27	0.9	0.1	9.4	0.2
227.8	27.1	4913.2422	pp28	2.7	0.1	9.2	0.3
381.5	30.1	4913.5812	pp29	3.7	0.1	9.4	0.3
511.9	29.1	4910.9848	pp30	1.4	0.1	9.5	0.3
541.8	70.1	4916.5103	pp31	1.6	0.1	9.3	0.3
540.3	191.6	4913.4224	pp32	12.8	0.1	9.7	0.3
539.8	312.5	4911.393	pp33	9.2	0.1	9.1	0.3
544.6	434.7	4913.6047	pp34	2	0.1	9.6	0.4
492.9	506.9	4913.756	pp35	2.4	0.1	9.6	0.4
465.2	559.5	4919.5704	n1				
338.2	562.7	4921.3647	n2				

Table C-2. (continued).

Easting[a]	Northing[a]	Elevation[b] (ft amsl)	Comment	Cs-137	±2 Sigma	K-40	±2 Sigma
219.8	559.6	4917.1918	n3				
60.7	556.9	4919.7212	n4				
0.0	489.3	4925.7114	w1				
4.4	327.2	4925.0096	w2				
1.2	188.4	4921.0534	w3				
4.0	64.6	4922.2879	w4				
71.2	2.4	4924.314	s1				
232.4	0.3	4923.5307	s2				
380.1	0.0	4922.8542	s3				
510.5	2.3	4927.5939	s4				
561.8	53.7	4926.409	e1				
562.2	174.7	4926.2942	e2				
565.8	347.0	4926.2748	e3				
559.4	493.8	4924.0765	e4				
499.0	526.5	4924.2526	e6				

a. Easting and northing coordinates are in feet and relative to the pond.
b. Elevations in feet and are NGVD 29 Vertical.
amsl = above mean sea level.