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Revision 0

U.S. Department of Energy
Idaho Operations Office

Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 4-6 (Phase II) Remedial Design/Remedial Action Work Plan

July 2006

Idaho Cleanup Project

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Project Number 23083

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DOE Idaho Operations Office

ABSTRACT

This Remedial Design/Remedial Action Work Plan provides the framework for defining the remedial design requirements, preparing the design documentation, and defining the remedial actions for Waste Area Group 3, Operable Unit 3-13, Group 3, Other Surface Soils, Remediation Sets 4-6 (Phase II) located at the Idaho Nuclear Technology and Engineering Center at the Idaho National Laboratory. This plan details the design developed to support the remediation and disposal activities selected in the Final Operable Unit 3-13, Record of Decision. The sites to be addressed, as described in this Work Plan include Set 4 sites: CPP-01, -04/05, -08, -09, -10, -11 and -19; Set 5 sites: CPP-13, -35, -36, -48, -91, and -93; and Set 6 sites: CPP-14, -41A, -44, -55 and -68. Additional sites included in this plan include: CPP-37B, CPP-37C (Phase I sites) CPP-60 (Group 2), CPP-81 (former OU 3-14 site), and CPP-124 and CPP-129 (new sites). As new sites are identified at INTEC, this work plan provides a mechanism for future remediation. This plan and its supporting documents provide remediation details of each site and the associated contaminants, design and regulatory requirements, and specific remediation tasks. This document also provides the associated schedule, health and safety, quality, and other required documentation.

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FIGURES

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ACRONYMS

bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COC	contaminant of concern
COPC	contaminant of potential concern
CPP	Chemical Processing Plant
DD&D	deactivation, decontamination, and decommissioning
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
EDF	Engineering Design File
EPA	U.S. Environmental Protection Agency
FFA/CO	Federal Facility Agreement and Consent Order
HI	hazard index
ICDF	INL CERCLA Disposal Facility
ICPP	Idaho Chemical Processing Plant
IDEQ	Idaho Department of Environmental Quality
IDAPA	Idaho Administrative Procedures Act
INEEL	Idaho National Engineering and Environmental Laboratory[a]
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
LDR	land disposal restriction
OU	Operable Unit
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RD/RA	remedial design/remedial action
RI/BRA	Remedial Investigation/Baseline Risk Assessment
ROD	Record of Decision
WAG	Waste Area Group
WINCO	Westinghouse Idaho Nuclear Company

a. Beginning February 1, 2005, the name of the Idaho National Engineering and Environmental Laboratory (INEEL) was changed to Idaho National Laboratory (INL).

Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 4-6 (Phase II) Remedial Design/Remedial Action Work Plan

1. INTRODUCTION

This Remedial Design/Remedial Action (RD/RA) Work Plan was prepared to implement the remedy for the Idaho Nuclear Technology and Engineering Center (INTEC) at the Idaho National Laboratory (INL) (see Figure 1-1) in accordance with the Idaho National Engineering and Environmental Laboratory (INEEL) Federal Facility Agreement and Consent Order (FFA/CO) (DOE-ID 1991).[b] This RD/RA Work Plan addresses the implementation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC § 9601 et seq.) remedies for the INTEC Waste Area Group (WAG) 3, Operable Unit (OU) 3-13, Group 3, Other Surface Soils, Remediation Sets 4-6 (Phase II) sites. These CERCLA remedial actions will proceed in accordance with the signed Record of Decision (ROD) for OU 3-13 (DOE-ID 1999a).

1.1 OU 3-13, Group 3, Other Surface Soils Background

Under the FFA/CO, the INTEC facility was designated as WAG 3, which was subdivided into 13 OUs that were investigated for contaminant releases to the environment. Of the 101 release sites identified for WAG 3, 55 contaminant release sites were identified within OU 3-13 in 1999 as requiring remedial action to mitigate risks to human health and the environment under a future residential use scenario. These sites were then divided into the following seven groups that share common characteristics and contaminant sources:

- Group 1: Tank Farm Soils
- Group 2: Soils Under Buildings and Structures
- Group 3: Other Surface Soils
- Group 4: Perched Water
- Group 5: Snake River Plain Aquifer
- Group 6: Buried Gas Cylinders
- Group 7: VES-SFE-20 Hot Waste Tank System.

The Group 3, Other Surface Soils sites consist of 29 of the 55 OU 3-13 release sites as identified in the OU 3-13 ROD that required remedial action. These 29 sites were divided into six remediation sets, as documented in the *Operable Unit 3-13, Group 3, Other Surface Soils, Prioritization and Site Grouping Report* (DOE-ID 2002a), which presents the criteria analysis used to determine how the Group 3 sites were grouped together and prioritized for remediation. Because some Group 3 release sites overlap and/or extend under buildings or structures, they were evaluated for phased remediation to remove high-risk contaminated soils that are not under buildings and place them in a lower-risk configuration in the INL CERCLA Disposal Facility (ICDF).

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b. Beginning February 1, 2005, the name of the Idaho National Engineering and Environmental Laboratory (INEEL) was changed to Idaho National Laboratory (INL).

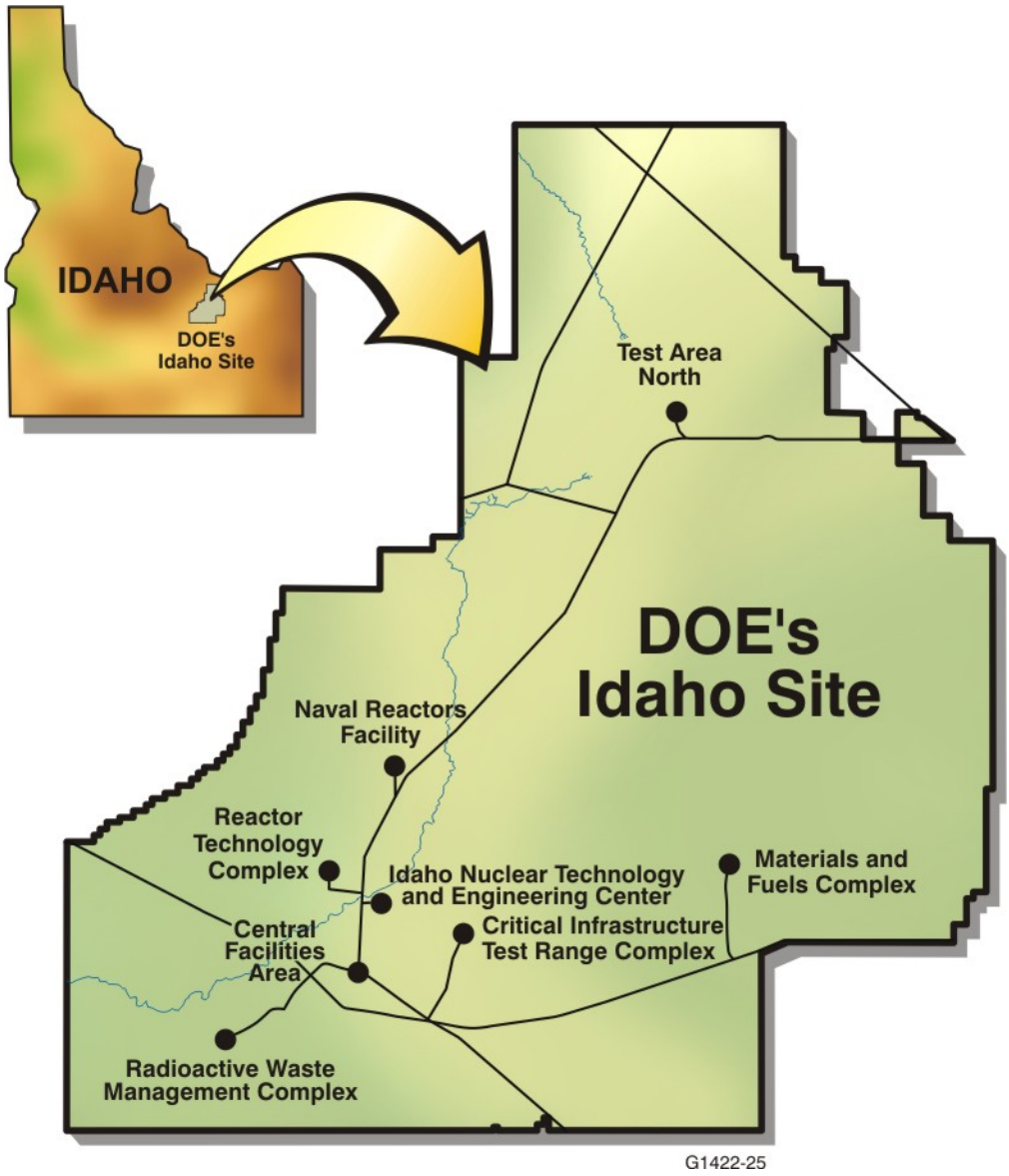


Figure 1-1. The Idaho National Laboratory.

1.1.1 Group 3, Phase I Sites – Sets 1, 2, and 3

The assessment, characterization and/or remediation of Sets 1, 2, and 3 will be completed as Phase I of the OU 3-13, Group 3, Other Surface Soils, remediation project. Remediation Sets 1, 2, and 3 consist of the following sites:

Remediation Set 1

- CPP-97 – Remediation - Tank farm soil stockpiles from tank farm upgrade
- CPP-92 – Remediation - Boxed soil from tank farm upgrade and other INTEC excavations
- CPP-98 – Remediation - Tank farm shoring boxes from tank farm upgrade
- CPP-99 – Remediation - Boxed soil from tank farm upgrade and CPP-604 tunnel egress excavation.

Remediation Set 2

- CPP-37B – Characterization - Gravel pit and debris landfill inside INTEC fence
- CPP-37C – Characterization - New site contamination area southeast of CPP-37B.

Remediation Set 3

- CPP-03 – Characterization and Remediation - Temporary storage area southeast of CPP-603.
- CPP-37A – Assessment and determination that no remediation is required - Gravel pit outside INTEC fence
- CPP-67 – Remediation - Percolation Ponds 1 and 2
- CPP-34A/B –Remediation - Soil storage areas (disposal trenches) in northeast corner of INTEC.

1.1.2 Phase II Sites - Sets 4, 5 and 6

The remedial design and remedial action of the Group 3, Phase II Other Surface Soils, Sets 4, 5, and 6 sites is the scope of this RD/RA Work Plan. Additional soil sites have been added to this Work Plan as new Group 3 sites. This Phase II RD/RA Work Plan includes the following sites as summarized below and shown in Figure 1-2:

Remediation Set 4

- CPP-01 – Concrete settling basins and dry wells east of CPP-603
- CPP-04/05 – Contaminated soil area around CPP-603 settling tanks and settling basin
- CPP-08/09 – Basin filter system line failure and soil contamination at northeast corner of CPP-603 south basin
- CPP-10 – CPP-603 plastic line leak
- CPP-11 – CPP-603 sludge and water release
- CPP-19 – CPP-603 to CPP-604 line leak.

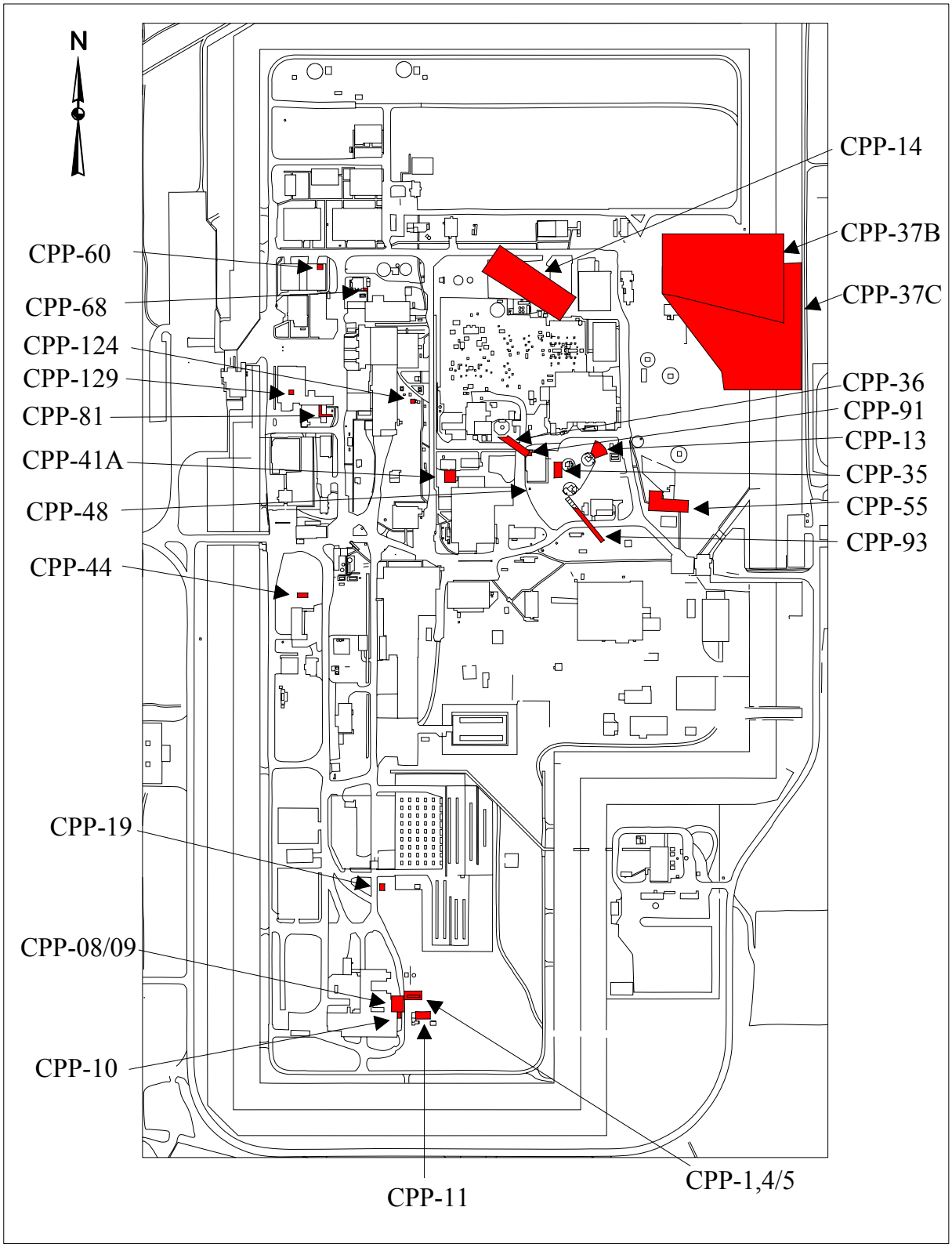


Figure 1-2. Operable Unit 3-13, Group 3, Other Surface Soils, Remediation Sets 4 – 6 (Phase II) sites.

Remediation Set 5

- CPP-13 – Pressurization of solid storage cyclone release northeast of CPP-633
- CPP-35 – CPP-633 decontamination spill
- CPP-36 – Transfer line leak from CPP-633
- CPP-48 – French drain south of CPP-633
- CPP-91 – CPP-633 blower pit drain
- CPP-93 – Simulated calcine disposal trench.

Remediation Set 6

- CPP-14 – Old sewage treatment plant west of CPP-664
- CPP-41A – Fire training pits between CPP-666 and CPP-633, under asphalt
- CPP-44 – Grease pit south of CPP-608
- CPP-55 – Mercury contamination area south of CPP T-15
- CPP-68 – Abandoned gasoline tank CPP-VES-UTI-652.

Other Soil sites included in this OU 3-13, Group 3, Phase II RD/RA Work Plan:

- CPP-37B, Gravel Pit 2 and debris landfill inside INTEC fence [c]
- CPP-37C, New site contamination area (construction debris) southeast of CPP-37B
- CPP-60 – Paint shop (storage building) at present location of CPP-645[d]
- CPP-81 – Abandoned CPP-637/CPP-601 vessel off-gas line [e]
- CPP-124 – Leak east of CPP-601[f]
- CPP-129 – Soils under the CPP-637 and CPP-620 Facilities.[g]

1.2 RD/RA Work Plan Organization

This Work Plan has been developed to present the remedial design for implementing the OU 3-13, Group 3, remedial actions. The plan and its supporting documents provide details of each remediation site and its associated contaminants, design and regulatory requirements, specific remediation tasks, project

c. Sites CPP-37B and -37C are Phase I sites and included in the Phase I Work Plan. 2005 characterization data have shown the contamination levels are not a threat to human health and the environment, and are, therefore, discussed in the Phase II Work Plan for final remedial close-out.

d. Site CPP-60 is an OU 3-13 Group 2 site that has been included in this work plan for remedial action discussion.

e. Site CPP-81, assigned to the OU 3-14 RI/FS for risk based decision under the #-13 ROD, was assigned to the OU 3-13, Group 3, Phase II for remediation.

f. Site CPP-124 was recommended for inclusion as a new FFA/CO site in February 2006. It was assigned to OU 3-13 for remedial action.

g. Site CPP-129 was established as a new site on March 24, 2006 and assigned to OU 3-13, Group 3, Phase II for risk based and remedial action decision.

organization, schedules, and cost estimates. The sections and appendixes of this plan and the attachments are:

- Section 1, Introduction, describes the historical background and regulatory history of the WAG 3, OU 3-13, Group 3 remediation sites and the planned remediation approach for these sites. The Existing Data Summary (see Appendix A), presents a summary of the existing data for each remediation site.

- Section 2, Design Basis and Requirements, presents the bases for the design of the remedies, including any assumptions, applicable criteria, standards, and requirements used to develop the designs. This section also includes the performance objectives established by the project, and applicable regulatory requirements.

- Section 3, Remedial Design, presents the design details for each remediation site, discusses the remediation and implementation strategy, specific site requirements, and identification and sequence of remediation tasks.

- Section 4, Remedial Action Work Plan, describes the controls and protocol developed for the Group 3 remedial actions, and discusses the interface between the contractor and subcontractor for each remediation task. This section also includes the project cost estimate and schedule; outlines the inspection requirements and documents, and the remedial action report requirements; describes waste management and tracking for the remediation sites.

- Section 5, Relevant Changes to the RD/RA Scope of Work, discusses relevant changes to the RD/RA Scope of Work identified in the Group 3, Phase I Rd/RA Work Plan for Sets 4, 5, and 6.

- Section 6, Environmental, Safety, Health and Quality, summarizes the project Health and Safety Plan requirements and relevant environmental and quality issues.

- Section 7, Five-Year Review, discusses the requirements for five-year reviews of the remedies to ensure protectiveness of the remedies.

- Section 8, Institutional Controls at the INL describes guidance in the U.S. Environmental Protection Agency (EPA) “Region 10 Final Policy on the Use of ICs at Federal Facilities” (EPA 1999); the EPA guidance “Institutional Controls: A Site Manager’s Guide to Identifying, Evaluating, and Selecting Institutional Controls at Superfund and Resource Conservation and Recovery Act (RCRA) Corrective Action Cleanups” (EPA 2000); and the DOE policy “Use of Institutional Controls” (DOE P 454.1).

- Section 9, References, lists the references used to prepare this Work Plan.

- Appendix A— Sampling/Borehole Figures and Existing Data Summary Tables. This appendix contains figures of sampling/borehole locations and tables of existing sampling and analytical data for the Phase II sites.

    - **NOTE**: The list of constituents in the Data Summary Tables was taken from the ICDF Complex Waste Acceptance Criteria (DOE/ID-10881) Table A-1. The list of constituents in Appendix A is not inclusive of all waste acceptance criteria constituents, but includes those elements and compounds that may have been analyzed for one or more of the OU 3-13 Group 3 Phase II sites at INTEC. The inclusion of a constituent in the list does not imply its presence at a particular site. The constituents having entries are representative of site characterization activities and were summarized in the ROD and compiled from two primary sources: (1) the Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at

the INEEL—Part A, RI/BRA Report (Final) DOE/ ID-10534, and (2) the Final Preliminary Scoping Track 2 Summary Report for Operable Unit (OU) 3-09, Lockheed Idaho Technologies Company, INEL-95/0094, Revision 4.

- Appendix B—Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 4-6 (Phase II) Design Drawings.
- Appendix C—Project Schedule.
- Appendix D—Project Cost Estimate.
- Appendix E—Pre-final Inspection Checklist.
- Appendix F—OU 3-13 Phase II New Site Work Plans.
- Attachment 1—Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 4-6 (Phase II) Field Sampling Plan, DOE/ID-11256.
- Attachment 2—Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 4-6 (Phase II) Waste Management Plan, DOE/ID-11258.

1.3 Remedial Action Approach

This section describes the general approach that will be implemented for remedial action of the Group 3 Phase II contaminated soil sites. Section 3.0 contains the details of the Remedial Design and Section 4 contains details of the remedial action implementation. The approach described in this section is based on a review of historical information for each Phase II site (see Section 1.4), existing sampling and characterization data (see Appendix A) and adoption of the EPA's TRIAD approach for streamlined site characterization and remediation (EPA 2001). The ROD selected remedy for the Group 3 Phase II Other Surface Soils is soil removal and onsite disposal at the ICDF. The OU 3-13 ROD provides the option to cap Group 3 sites under unique circumstances, however, the remedy discussed in this RD/RA Work Plan is soil excavation and disposal. The Group 3, Phase II remedial action approach to implement the ROD remedy is summarized as follows:

- Perform sampling and analysis of Group 3 New Sites using direct push probes and grab samples techniques to determine location, nature and extent of potential soil contamination
- Perform soil excavation according to remedial design requirements
- Record real-time spectroscopy results during and following excavation activities
- Perform confirmation sampling
- Dispose of contaminated soil at the ICDF
- Backfill excavated areas with clean soil. Contour with additional gravel and grade the areas to provide appropriate site drainage.

Group 3 Phase II contaminated soil will be disposed at the ICDF under a single waste profile prepared using the existing soil sampling and analysis data summarized in Appendix A. Excavation plot plans (see Appendix B) have been prepared for each site to be remediated.

At the completion of the remedial action, the real-time field spectroscopy data will be reviewed, summarized and included in the Group 3 Phase II Remedial Action Report. Institutional controls for all Group 3 Phase II sites will be revised and/or maintained according to the *Idaho National Engineering and Environmental Laboratory Sitewide Institutional Controls Plan* (DOE-ID 2004b).

1.3.1 Remediation Approach Using Real-Time Spectroscopy During Excavation

During initial (Track 1 or Track 2) site characterization and subsequent remedial investigation activities for Group 3 Phase II sites, sampling and analysis was performed to determine the location, nature and at least the vertical extent of soil contamination. The Group 3 Phase II site soil contamination release (or source) points and the depth of contamination are generally known, however the lateral extent of soil contamination may not have been fully determined for all Group 3 sites. Figures A-1 through A-7 in Appendix A identify the contamination releases or source points and the borehole/sampling locations for each Group 3 Phase II site.

The remediation of Group 3 Phase II soil sites will be performed according to the requirements described in this RD/RA Work Plan using existing characterization data and an understanding of the contamination source locations. The excavation plot plans in Appendix B identify the depth and estimated excavation boundaries for Group 3 Phase II sites. The historical Group 3 Phase II site boundaries are based on process knowledge and existing soil characterization data. Additional information, identified during RD/RA Work Plan scoping activities, has warranted the expansion of historical site boundaries for some Group 3 sites to incorporate the full extent of soil contamination. Site CPP-36 is an example of a site with multiple release locations necessitating the realignment of excavation boundaries for remediation. It is anticipated that excavations of other Group 3 sites could expand beyond historically defined boundaries by using real-time spectroscopy methods.

As real-time spectroscopy identifies contaminated areas exceeding remediation goals on sloped soil surfaces (lateral from the release source location and less than 10 feet bgs), additional excavation will be required to remove the contaminated soil. Ultimately, the remedial action will be complete when all soil contamination in a Group 3 Phase II site is excavated and any remaining soil contamination is confirmed to be below remediation goals using real-time spectroscopy methods. Figure 1-3 shows how a real-time spectroscopy system (Backpack Sodium Iodide System) is deployment and how processed data can be plotted to show the distribution of contaminants such as Cs-137 over detailed satellite images.

The real-time spectroscopy and analysis methods discussed in this approach are described in Sections 3.3 of this Work Plan and the Group 3 Phase II Field Sampling Plan (DOE-ID 2006a).

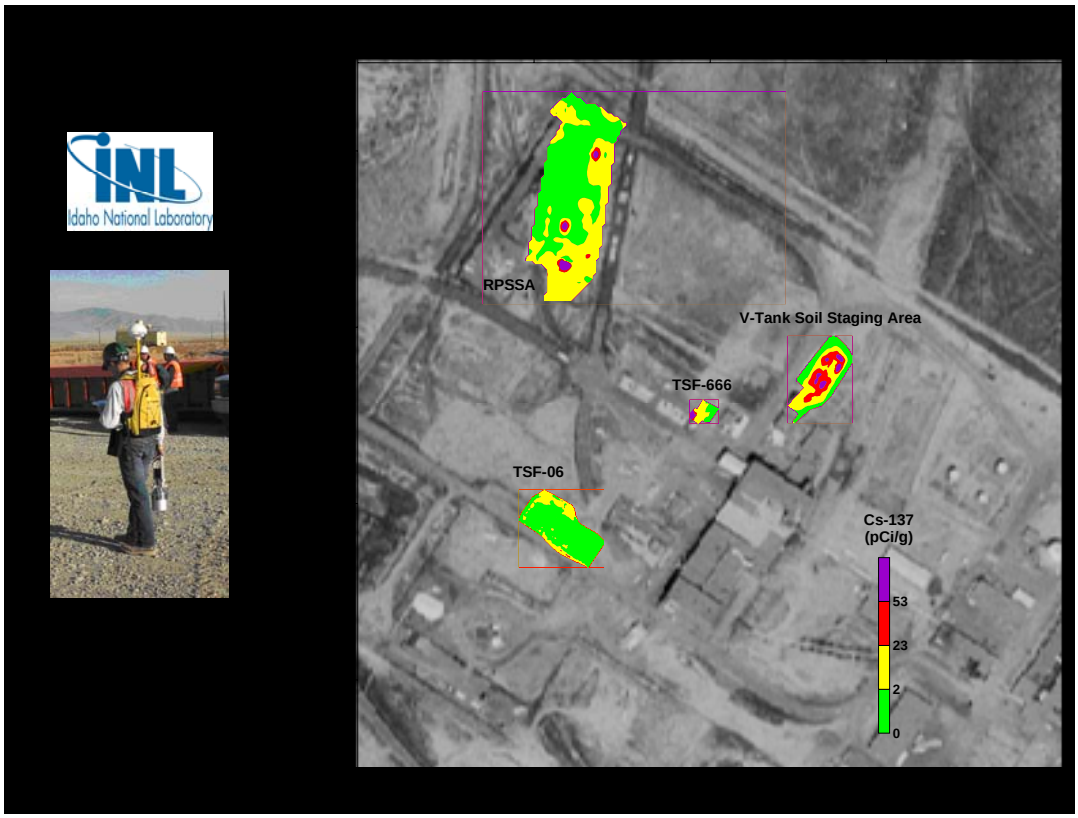


Figure 1-3. Processed data plot showing the distribution of Cs-137. As shown, these data can be overlain onto detailed satellite images.

1.3.2 Remediation Approach for Group 3 Sites Near Buildings or Structures

Some Group 3 release sites overlap or extend under buildings or structures. These sites will be remediated in phases depending on accessibility of the contaminated soils. For example, a portion of a Group 3 site that is accessible will be remediated in the near-term and the remainder of the site will be remediated or capped when the obstruction is no longer present. Site descriptions and data are presented, demonstrating that buildings overlie all or a significant portion of these sites. As examples, sites CPP-08/09 and CPP-10 are likely to extend under building CPP-603. And the northwest end of CPP-36 may extend beneath the INTEC stack. During remediation, other Group 3 site excavations may expand close enough toward a building or structure that excavating beneath the structure is not feasible. If contamination appears to continue beneath the building, the portion of the site below the building will be remediated separately or capped when the building is no longer present.

Remediation of Group 3 soil contamination that extends under buildings and structures as in separate phases will also ensure that the presence of the contaminated soils is documented and is addressed by institutional controls until the overlying building is closed and deactivation, decontamination, and decommissioning (DD&D) have occurred.

Phase II sites near INTEC buildings or structures will be considered remediated (i.e., the remedial action is complete) when the following criteria are met: (1) the remediation to a depth of 10 feet outside the building footprint has been completed, or (2) excavation next to a structure to a depth less than 10 feet where real-time spectroscopy verifies that contamination is removed or any remaining contamination is

below remediation goals. As an example, Site CPP-08/09 will be remediated according to the design figures in Appendix B and after the initial excavation is complete. Any lateral soil contamination on the excavation slopes will be remediated until soil contamination is confirmed to be below remediation goals.

When real-time spectroscopy and site knowledge indicates that contaminated soil at a depth below 10 feet continues under a building (or is impacted due to the footprint), the Group 3 site may be reclassified as a Group 2 site. The reclassification of a Group 3 site to a Group 2 site could occur via a new site ID; other agreement/documentation by the regulators; identified in a primary document, such as, the remedial action report; or whatever else is deemed acceptable by the Agencies.

When there is a potential for sites from different releases to overlap in a single excavation, this should be anticipated in the planning process, and the contaminants of concern (COCs) and extent of contamination from each potential site should be included in excavation planning and waste profile documents.

1.3.3 Remediation Approach for Managing Unexpected Soil Contamination During Excavation

At any given Group 3 Phase II site excavation there is a potential to encounter unexpected contamination. This contamination may manifest itself in many ways. It may simply be more extensive or higher levels than anticipated of the same contamination (same COCs) at a given site or something unexpected. Unexpected soil contamination may be discovered during real-time spectroscopy using field spectroscopy methods, through visual inspection as equipment operators are disturbing soil or by a radiological control technician using handheld (Ludlum) radiation meters as soils are surveyed prior to excavation or during excavation operations.

The following is a list of potential unexpected contamination scenarios that could be encountered during Phase II site excavations:

- A known or unknown pipe leak encountered during excavation
- Soil discoloration not consistent with existing site excavation soil
- Detection of organic or unusual vapors during excavation
- Unusual quantity of moisture seeping into excavation area (i.e., from beneath buildings and pipes)
- High radiation readings of soil from hand held survey instrumentation (Ludlum)
- Unusually high contamination (i.e., above remediation goals) identified using real-time spectroscopy instrumentation
- Leaking known RCRA waste lines.

It is recognized that various combinations of these scenarios will likely occur. The approach to managing unexpected contamination suggested in this section is meant to give the project manager the flexibility to remediate as much of the contaminated soil as is practicable while at the same time allowing him/her to declare a site remediated if the original contamination as described in Section 1.4 has been removed and newly encountered or unexpected contamination is managed appropriately.

The most likely scenario for managing unexpected contamination will be to evaluate the contaminated soil against the existing ICDF profile and if it can be managed under the existing profile, the soil will be disposed at ICDF. If the contamination exceeds the Group 3 material profile limits, the soil will be containerized, sampled for laboratory analysis, (if necessary) and the existing profile will be updated or a new profile will be prepared prior to disposal. The flow diagram in Figure 1-4 is provided as

a logical approach to addressing unexpected contamination when it is encountered during excavation. The steps to mitigate unexpected soil contamination will most likely include: identification, containerize (as necessary), soil characterization, review of the existing Group 3 material profile, and soil disposal at ICDF.

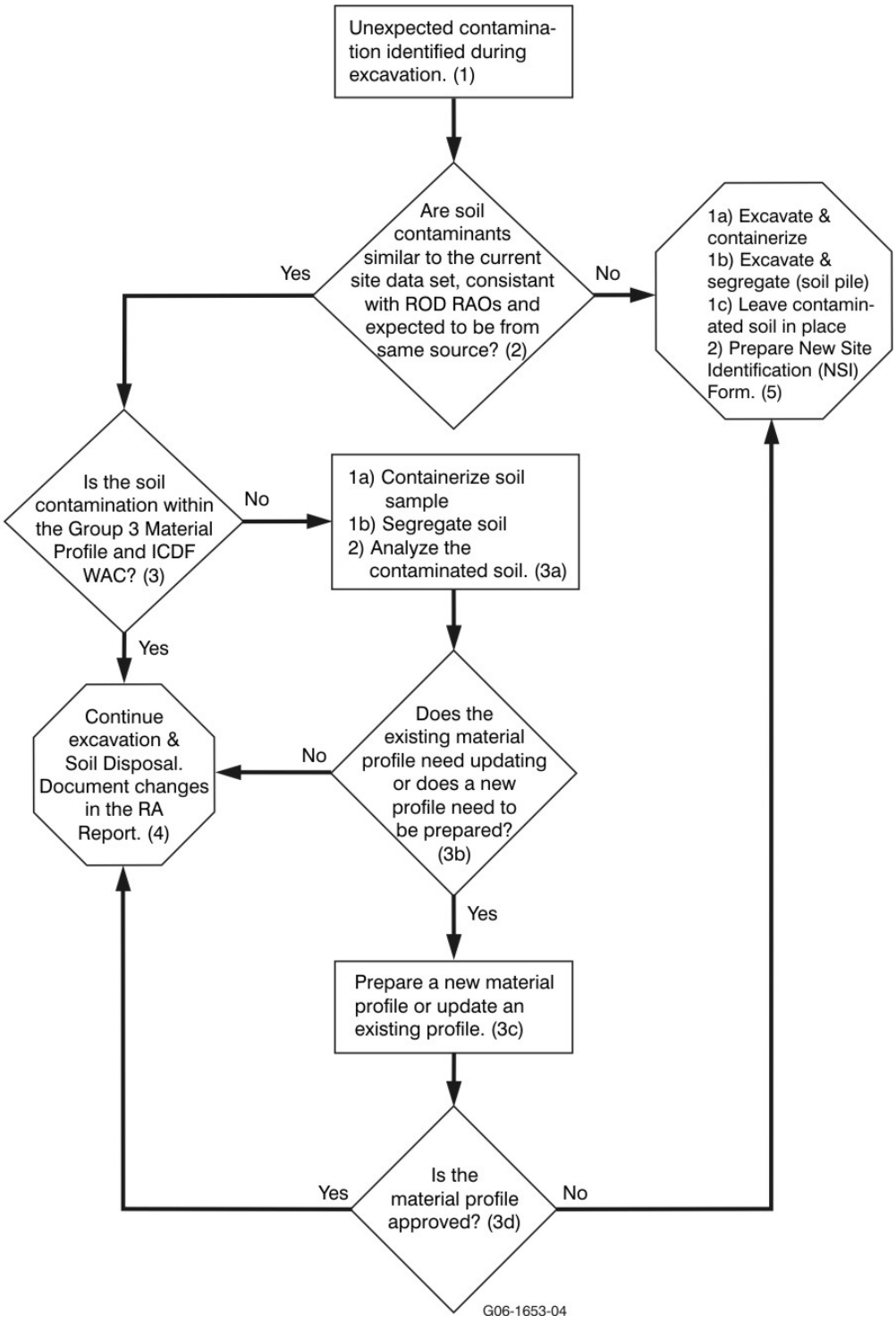


Figure 1-4. Logic diagram for addressing unexpected contamination.

The main points of the logic diagram are:

- Unexpected soil contamination may be discovered during real-time spectroscopy, visual inspection of soil or by a radiological control technician using handheld (Ludlum) radiation meters (box 1). Quantitative data from real-time field spectroscopy, information about the original release source location and knowledge of processes in the surrounding area will be evaluated to determine if the contaminated soils are similar to the existing CERCLA site data set or radically different (boxes 2 and 3). If the contaminated soils are too different, the soil may be containerized and samples collected for characterization per the Group 3 Field Sampling Plan (boxes 3a to 3d).

- If the contamination consists of the same COCs but at higher concentrations, the excavation will continue (box 4). The real-time spectroscopy or characterization results from the unexpected contamination (box 3a) will be compared to the ICDF waste acceptance criteria (box 3b). The extent of contamination, the excavation details, and the volume of contaminated soil shipped to the ICDF will be documented in the Remedial Action Report.

- Additional, if contamination consists of different COCs than those currently listed in the existing Group 3 Phase II waste profile, it may be necessary to update a different INTEC soils material profile or prepare a new waste profile (box 3c). Following material profile approval (box 3d), the site excavation is continued and the specifics of the new contamination and extent of excavation are documented in the Remedial Action Report (box 4). If the material profile is not approved (box 3d), the contaminated soil will be managed appropriately and the New Site Identification form will be initiated (box 5).

- If the unexpected soil contamination is not consistent with the site soil contamination or the ROD remedial action objectives and is not expected to be from the same release source (box 2), the following options may be considered (box 5):

    - The contaminated soil is excavated and containerized for future evaluation

    - The contaminated soil is excavated and segregated (soil pile) for future evaluation

    - The contaminated soil could be left in place for future evaluation

    - The new site identification form is prepared for agency approval.

    The extent of the site excavation will be documented in the Remedial Action Report.

The field work control documentation will have “step back” and hold points if unexpected conditions or contamination are encountered during excavation operations. The work control documentation will establish the steps for resuming soil excavation activities. This discussion is not designed to address re-start issues relating to worker health and safety or radiation control but is intended to provide guidelines to address the issue of encountering unexpected contamination during excavation and provide a path forward.

1.3.4 Iodine-129 Characterization

This section presents a summary of the INTEC waste processing to determine whether Iodine-129 (I-129) would be expected in Group 3 Phase II remediation sites and if additional sampling would be necessary for this constituent.

In the INTEC fuel reprocessing system, virtually all of the Cs-137 originally in the fuel went with the first-cycle raffinate into the INTEC tank farm, and then to the calcine solids storage facilities (for waste that was calcined). Most (80-90%) of the I-129 in the fuel also went with the first-cycle raffinate into the tank farm. This maintained a ratio of Cs-137 to I-129 of approximately 1,000,000 to 1 in the tank farm first cycle raffinate. However, the high-temperature calcination process provided a separation point for Cs-137 and I-129. Most of the I-129 volatilized in the calcination process and was emitted with the calciner off-gas to the atmosphere. Most of the Cs-137 stayed in the calcine. Studies show 1 percent or less of the I-129 in the fuel was retained in the calcine. The Cs-137 to I-129 ratio in calcine is estimated to be 100,000,000 to 1, or more.

In contrast, liquid waste from calcine-related processes can be either depleted I-129 or enriched I-129 (relative to tank farm waste). Liquid waste originating from calcine, such as calciner bed dissolutions, was depleted in I-129. Liquid waste originating from the condensation of calciner off-gas, such as condensate in the INTEC main stack drain line or calciner off-gas line, was enriched in I-129; however the ratio of Cs-137 to I-129 is not known.

Based on this information, the Group 3 Phase II site CPP-36, could potentially be contaminated with liquid waste originating from the condensation of calciner off-gas enriched in I-129. Site CPP-36 soil may be sampled and analyzed for I-129 prior to disposal at the ICDF per the Field Sampling Plan (DOE-ID-11256). Other Group 3 Phase II soil sites will not be sampled for I-129 since this contaminant is not expected to be present at detectable concentrations.

1.3.5 New Site Identification Process and Additional Site Inclusion Strategy

This Group 3, Phase II Work Plan currently contains remedial design/remedial action details for 25 identified soil contamination sites. These sites are categorized as follows:

- 8 are Phase II, Remediation Set 4 sites (CPP-01, -04, -05, -08, -09, -10, -11, -19)
- 6 are Phase II, Remediation Set 5 sites (CPP-13, -35, -36, -48, -91, -93)
- 5 are Phase II, Remediation Set 6 sites (CPP-14, -41A, -44, -55, -68)
- 2 are Phase I, Remediation Set 2 sites (CPP-37B, -37C)
- 1 is a former Group 2, Soils under Buildings and Structures site (CPP-60)
- 2 are newly identified sites (CPP-124 and CPP-129)
- 1 is a former OU 3-14 site that has been assigned to OU 3-13, Group 3 (CPP-81).

Expectations are that additional sites will be added over time and are likely to be former Group 2 sites, newly identified sites, or former no action sites from which new information has been obtained. Group 2 sites (soils under buildings and structures) have clearly defined pre and post DD&D remediation goals (DOE-ID 1999a). Pre DD&D remediation goals are to be accomplished by maintaining the current building/structure to protect workers/non-workers and manage moisture/surface water run-on/precipitation infiltration to minimize leaching and transport of soil contaminants downward. Once DD&D activities have been completed, remediation goals for Group 2 sites match those identified for Group 3 sites. Thus, for efficiency, these newly accessible sites will be added to and remediated under the details of this work plan rather than creating a Group 2 RD/RA Work Plan.

During remediation and other activities, new sites may be identified. This will be performed under the FFA/CO New Site Identification process which provides a recommendation for or against inclusion as

a new FFA/CO site. If included, a recommendation is given on which waste area group and operable unit it is to be assigned plus lists recommended actions (e.g., no action, no further action, remedial action under existing ROD, Track 2, or Remedial Investigation/Feasibility Study). If it is determined that investigation/remediation is required and that a new site can be managed as a Group 3 soil site, the new site will be added to this current work plan (Note: the number of revisions to the work plan will be minimized. Inclusion of new sites will be performed as efficiently as possible, such as adding two or more sites at a time). An example of this is the newly identified site CPP-124.

The process for including additional sites into the work plan involves the creation of a subsection in Appendix F that contains description, history, characterization, data, and remediation details to include location map and engineering design sketch. Each addition will be contained in a separate Appendix F subsection (e.g., F-1, F-2). To accommodate this addition, the next revision of the work plan will be prepared by updating the table of contents, revising the Field Sampling Plan (DOE-ID 2006a), and inserting the appendix subsections per the requirements of the Document Management System. Following review and approval, the revised work plan documents will then be made available for project use.

The steps for including additional sites into the Group 3, Phase II Work Plan are:

Step 1: Insert a copy of the New Site Identification Form or provide an equivalent site description. Describe remedial design/action decisions, include a location map and design sketch, attach available analytical data, and provide references to additional relevant information.

Step 2: Update the RD/RA Work Plan table of contents and insert the contents from Step 1 into Appendix F as a subsection.

Step 3: Revise the remainder of the work plan to reflect any other project changes (as necessary).

Step 4: Revise the Group 3, Phase II Field Sampling Plan (as necessary).

Step 5: Submit for required reviews, incorporate comments, finalize and issue the revised document.

NOTE: The inclusion of new sites to the Group 3, Phase II Work Plan will be presented to the public for information and comment through the required 5-year review.

1.4 Site Descriptions and Existing Data Evaluation

This section presents a summary of each Group 3, Phase II and additional sites included in the work plan. Information presented includes: site description, characterization history, and remedial action decision analysis. Table 1-4 summarizes the information provided and presents a plan of action for each contaminated soil site.

1.4.1 CPP-01, Concrete Settling Basins and Dry Wells East of CPP-603

1.4.1.1 Description. Site CPP-01 is a 47-m^2 (500-ft^2) site that is a portion of the fuel storage basin cleanup support system and is located east of building CPP-603 (Figure 1-5). The original system, built in 1951 and operated until 1962, consisted of a 1.5 × 1.5 × 5.8-m (5 × 5 × 19-ft) vertical settling vault (CPP-301) that received the backwash slurry of filter aid material (diatomaceous earth) from the BIF (brand name) filter system associated with the Fuel Receiving and Storage Facility activities. When the slurry in the vault settled, the supernatant was drained from the vault to a deep dry well (CPP-303), where the effluent percolated into the surrounding soil. CPP-303 is located approximately 10 m (100 ft) south of CPP-301 and connected by a 15-cm (6-in.) diameter stainless steel pipe. In 1962 a horizontal settling

system, consisting of horizontal settling basin CPP-740 and a dry well SW-048, was constructed to expedite the slow settling rate of the original system, and CPP-301 was valved out of service at this time.

CPP-740 included a 1.2 × 1.6 × 9.1-m (4 × 5.3 × 30-ft) horizontal settling system of weir compartments and an access manhole. This system was used to settle slurry solids and drain the supernatant to dry well SW-048 which directed it to the surrounding soils (see Figure 1-5). The use of the dry wells were discontinued in 1966, prompting the reactivation of CPP-301 as a settling pit and employed steam jetting to transfer the supernatant to a waste storage tank, VES-SFE-20. Use of the CPP-740 settling facilities was terminated in 1977 when the BIF filter system was replaced by a system of pressurized sand filters (INEL 1995).

The total volume (18,925 L [5,000 gal]) of sludge and liquid in the horizontal settling basin CPP-740 and the vertical settling pit CPP-301 was removed in the fall of 1993 under a removal action. The liquid removed was sent to the Process Equipment Waste Evaporator Facility and the sludge was dried and sent to the Radioactive Waste Management Complex (DOE-ID 1997a).

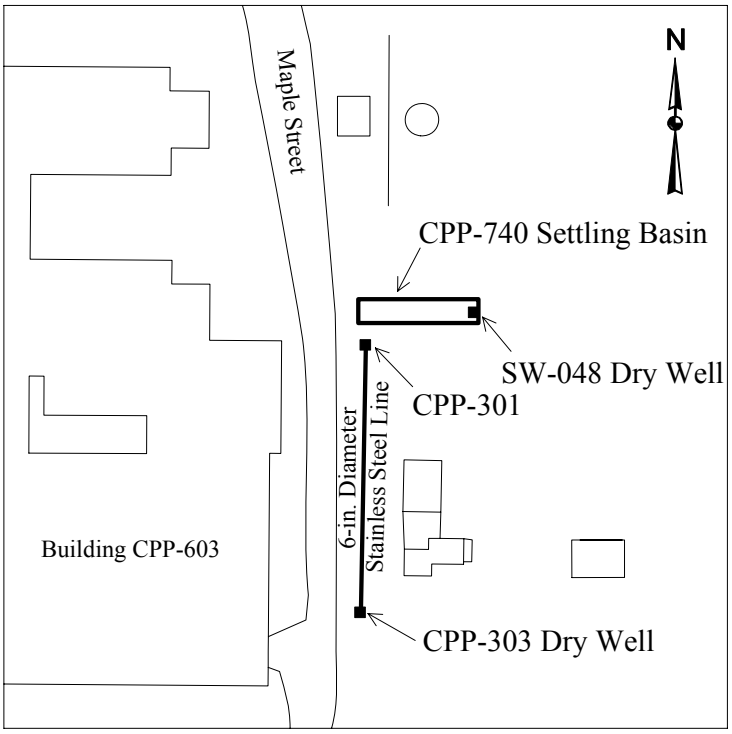


Figure 1-5. Location of CPP-01 site components.

1.4.1.2 Characterization History. The contents of the horizontal settling basin, vertical settling pit, and dry well SW-048 were sampled in 1981 and analyzed to determine quantitative and qualitative isotopic distribution. The alpha, beta, and gamma activity measured in the vertical settling pit CPP-301 was several orders of magnitude higher than activity in the horizontal settling basin CPP-740 and dry well SW-048 (see reference INEL 1995, Tables 3-1 and 3-2, for sample results).

A second sampling effort was performed in 1993 on the horizontal settling basin CPP-740, vertical settling pit CPP-301, and dry well CPP-303. The bottom of the settling basin was reported to be approximately 3.7 m (12 ft) from the ground surface and contained 1.3 m (4.3 ft) of water and 0.64 cm (0.25 in.) of rust colored sludge. The bottom of the dry well CPP-303 was reported to be 18 ft below land

surface (bgs) and was covered by a cohesive layer of sediment material. The vertical settling pit (CPP-301) was found to be in excess of 5.8 m (19 ft) deep and filled with sludge to 5.2 m (17 ft) bgs with a water level at 2.7 m (9 ft) bgs. Results for liquid samples collected showed elevated levels of Cs-137 and Eu-154. Results for soil samples collected indicated elevated levels of Cs-137, Eu-152, Eu-154, Eu-155, gross beta, total Sr, gross alpha, Pu-238, Pu-239, and total U. Complete sampling results from the horizontal settling basin, vertical settling pit and dry well are listed in reference INEL 1995, Table 3-3.

As part of the OU 3-09 Track 2 characterization activities at CPP-01 in 1993, three soil borings were drilled: one adjacent to dry well SW-048, one at the horizontal settling basin CPP-740, and one at the vertical settling pit CPP-301, and one at the dry well CPP-303. In addition, a sample was also collected from the bottom of dry well SW-048 using a hand auger. At each of the three boreholes, a sample was collected between 0 to 0.15 m (0 to 0.5 ft) bgs and continuous samples were taken from 0.15 to 3 m (0.5 to 10 ft) bgs with the sample collected from intervals having the highest radiation levels were sent for laboratory analyses. Sample results from the boreholes and dry well showed the presence of the following radiological contaminants: Am-241, Co-57, Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Sr-90, U-235, and U-238 (DOE-ID 1999a). Of these, levels of both Cs-137 and Sr-90 exceeded the remediation goals. Results for Cs-137 were as high as 3,920 pCi/g from the borehole near the dry well SW-048 and as high as 1,800 pCi/g from the borehole near dry well CPP-303 both at depths from 8 to 10 ft bgs. Results for Sr-90 were exceeded from the borehole near dry well CPP-303 with a high of 650 pCi/g at the 8 to 10 ft level bgs. A detailed description of sampling activities is available from the Remedial Investigation/Baseline Risk Assessment (RI/BRA) (DOE-ID 1997a) and the OU 3-09 Scoping Track 2 (INEL 1995). A list of sampling results is available in Appendix A.

1.4.1.3 Remedial Action Decision. Data collected prior to the Track 2 investigation was obtained to determine the presence and concentrations of radiological contaminants for use in waste management and disposal. The objective of the Track 2 Investigation was to obtain sufficient valid data to conduct a Track 2 risk assessment and evaluate the possible risks to human health posed by contaminants, and determine if additional data collection is required. An evaluation of the data obtained from site CPP-01 concluded that contaminants of concern are present at levels that exceed the remediation goals and require remedial action. Site CPP-303, Deep Dry Well, located approximately 30 m (100 ft) south of the CPP-740 area is connected to CPP-301 by a 15-cm (6-in.) diameter stainless steel line (6-inch PLA-100380). This line is not suspected to have leaked during use and the area between CPP-301 and CPP-303 is not considered to be contaminated. Based on recent surveys and a review of facility utility drawings, the top of the inlet to this line (highest elevation) is 4,906.3 ft above median sea level per the area's utility drawing. The current land surface around CPP-301 averages 4,918.75 ft above median sea level, which places this pipeline 12 ft bgs, which exceeds the required excavation depth of 10 ft bgs.

1.4.2 CPP-04/05, Contaminated Soil Area around CPP-603 Settling Tanks and Settling Basin

1.4.2.1 Description. Site CPP-04 is a 10.0 × 20.4-m (33 × 67-ft) area of contaminated soil above the horizontal settling basin CPP-740 and Site CPP-05 is a site (with the same dimensions) of contaminated soil above the vertical settling pit CPP-301 (see Figure 1-6). These two sites reportedly became contaminated from unintentional releases during sludge removal activities from the two structures in 1978 (DOE-ID 1999a). These sites, located east of CPP-603, were combined because they were determined to have resulted from the same release. The releases of the contaminated sludge had left the area contaminated to such an extent; it was later covered with 0.6 m (2 ft) of soil.

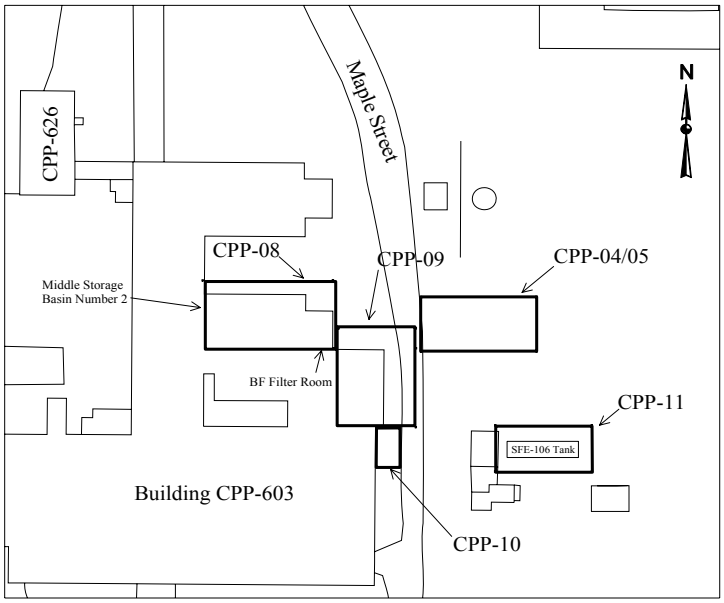


Figure 1-6. Location of Sites CPP-04/05, 08, 09, 10, and 11.

1.4.2.2 Characterization History. As part of the characterization activities of the horizontal settling basin CPP-740, soil samples were collected in 1981 in the area sectioned into 1.5 × 1.5-m (5 × 5-ft) grids. At each grid intersection, a boring was drilled and four soil samples were collected. A total of 204 samples were collected from 51 boring locations. Analytical results identified seven major gamma-emitting isotopes; Co-60, Cs-134, Cs-137, Ce-144, Eu-152, Eu-154, and Eu-155. Cs-137 was the most widely distributed of the radionuclides detected at levels above 1,000 pCi/g in 30 of the samples collected. Cs-137 ranged to a maximum activity of 26,500 pCi/g in a sample collected 0.3 m (1 ft) bgs from near the CPP-740 manway access. Eu-152 and Eu-154 were found at activities above 1,000 pCi/g in 28 of the samples collected, while Eu-155 was found above 1,000 pCi/g in 10 of the samples collected. Eu-152 reached a maximum activity of 35,000 pCi/g, and Eu-154 reached a maximum activity of 35,000 pCi/g, which was also in the 0.3 m (1.0 ft) sample near the CPP-740 manway access. Ce-144 was found above 1,000 pCi/g in six samples, while Cs-134 and Co-60 were not detected above this activity (DOE-ID 1997a). In summary, the sample results show activity levels of Cs-137, Eu-152, and Eu-154 above remedial action objectives. In addition, sampling results from the Track 2 investigation for Site CPP-01, collected around CPP-740, CPP-301, and dry well SW-048, were collected within the area of CPP-04/05 and show levels of Cs-137 well above remediation goals. Because of these results, site remediation will be required. A list of analytical data for site CPP-04/05 is in Appendix A.

1.4.2.3 Remedial Action Decision. Sample results for CS-137, Eu-152, and Eu-154 indicated the levels of these COCs exceed remediation goals at depths down to 3 ft bgs. Excavation of the contaminated soils followed by backfilling with clean soils will be required.

1.4.3 CPP-08/09, Basin Filter System Line Failure and Soil Contamination at Northeast Corner of CPP-603 South Basin

1.4.3.1 Description. Sites CPP-08 and CPP-09 (see Figure 1-7) consist of soil contaminated by a leak of radiologically contaminated liquid from a recirculation line in the CPP-603 basin. In 1973, the water level in the CPP-603 basin was observed to be decreasing much faster than could be accounted for by operations in progress or evaporation. Additional observations revealed excessive leakage occurred only during basin filter operations. It was concluded that an underground carbon steel line in the filter

system most likely failed due to corrosion. The basin water circulation and filter system was taken out of service when the leak was traced to the circulation line. A blind flange was placed on the recirculation line on the south side of building CPP-603 after the leak was discovered, and the line was replaced with an aboveground line. During the seven-day period of the investigation, the rate of leakage averaged approximately 11,350 L (3,000 gal/day) (DOE-ID 1997a) for an estimated total discharge of 79,450 L (21,000 gal).

The exact location of the leak in the recirculation line was never determined. However, contaminated soil was encountered on the east side of CPP-603 while construction crews were replacing a leaking fire water line where a section of the recirculation line was located. The contaminated soil on the east side of building CPP-603 is identified in the FFA/CO as site CPP-09. Based on the circumstantial evidence discovered during the Track 2 investigation, the contaminated soil is believed to be associated with the release filter system line failure that has been identified as site CPP-08. The location of contamination associated with CPP-08 was arbitrarily chosen beneath the Middle Storage Basin Number 2 and BF Filter Room in CPP-603, because the exact location of the leak in the recirculation line was never determined. The extent of sites CPP-08 and CPP-09 is not known.

1.4.3.2 Characterization History. Sites CPP-08 and CPP-09 were combined as one site based on information gathered during preparation of the Track 2 report for OU 3-09 in 1995. During the discovery of the contaminated soil, the area of contamination was identified by radiological survey instruments and no soil samples were collected after the contamination was detected. As part of the OU 3-09 Track 2 characterization activities, one sample boring was drilled for site CPP-08/09. The boring was located to identify possible contaminants and concentration adjacent to where the basin water underground line exited beneath building CPP-603. Analytical results showed the only contaminants of potential concern (COPCs) detected at activity levels above background from the boring were Cs-137 and Sr-90. Cs-137 and Sr-90 were found at activity levels of 42.2 and 25.2 pCi/g, respectively, in the surficial sample. Both increased to maximum values of 1,080 and 140 pCi/g, respectively, in the 1.8 to 2.4-m (6 to 8-ft) interval, before decreasing to 14.9 and 90.8 pCi/g, respectively, in the 4.3 to 4.9-m (14 to 16 ft) interval. A detailed description of characterization activities is available in the OU 3-09 Track 2 Summary Report (INEL 1995) and a list of analytical data from site CPP-08/09 is available in Appendix A.

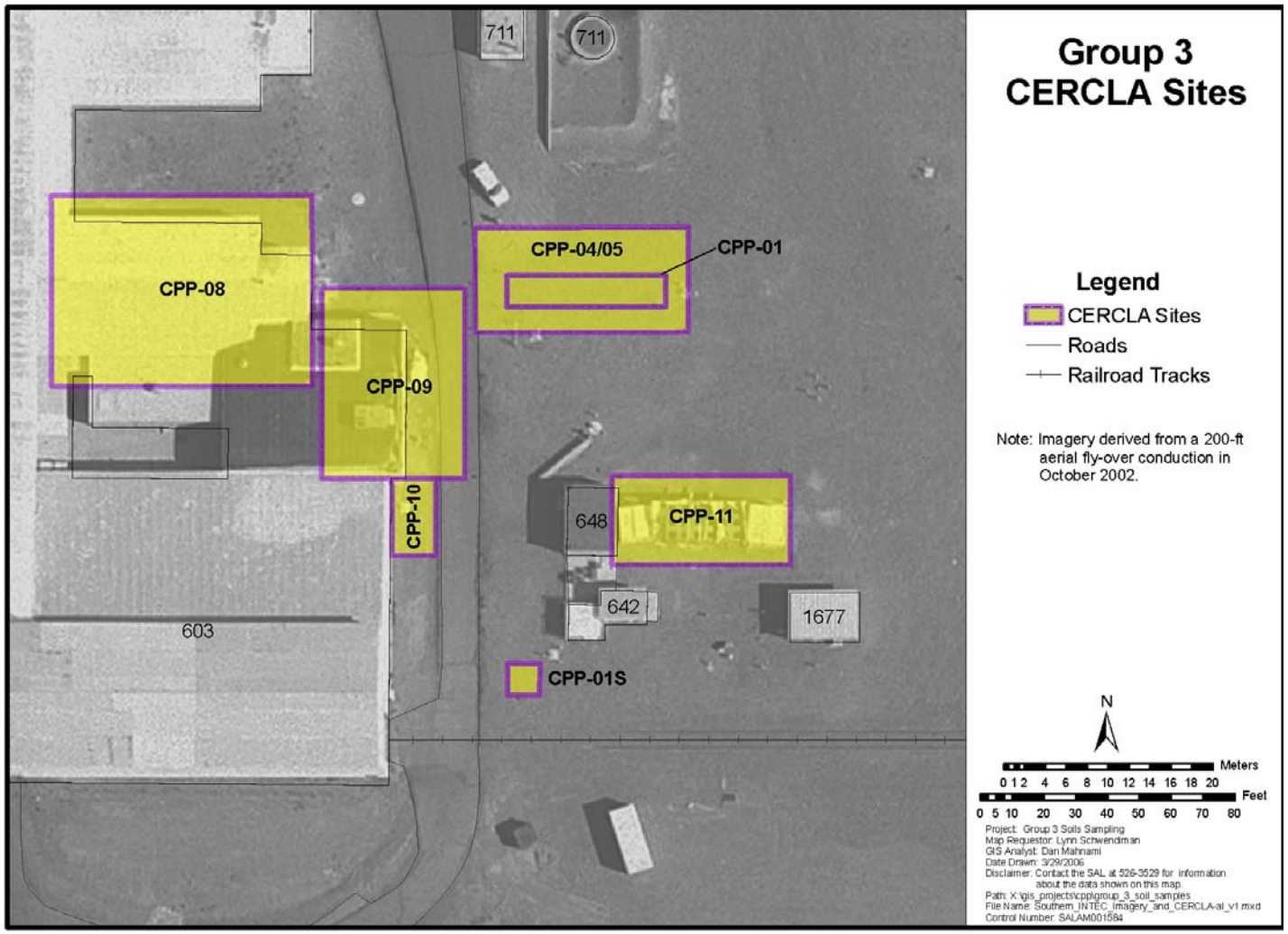


Figure 1-7. Group 3 CERCLA Sites.

1.4.3.3 Remedial Action Decision. Activity levels for Cs-137 exceed remediation goals of 23 pCi/g. Excavation of contaminated soils followed by backfilling using clean backfill will be required.

1.4.4 CPP-10, CPP-603 Plastic Line Leak

1.4.4.1 Description. Site CPP-10 resulted from the release of radionuclide-contaminated basin water that drained onto the building CPP-603 shielded area floor from a break in a polyvinyl chloride line (DOE-ID 1997b). The release occurred in December of 1976 when the CPP-603 fuel storage basin water filter system was started up. After approximately five minutes of operation, the system shutdown automatically due to standing water in the sump. A search discovered that the water was coming from behind the shielding wall where a 1.90-cm (3/4-in.) polyvinyl chloride (PVC) line had broken. A approximately 3,000 L (800 gal) of basin water drained onto the shield area floor and a small quantity of this drained through a personnel access door and contaminated a small area of an asphalt road and dirt area adjacent to CPP-603 (DOE-ID 1997a). Filter effluent and block valves were manually closed to minimize drainage. There is no documentation of any remedial actions at the site other than the placement of several inches of clean soil over the contaminated area.

1.4.4.2 Characterization History. No soil samples were collected from the area of contamination on the date of the release of the radioactively-contaminated liquid. As part of the Track 2 investigation for site CPP-10 (INEL 1995), one soil boring was drilled adjacent to building CPP-603 at the release site. Soil samples were collected and analytical data used to identify contaminants and determine concentrations. Analytical results identified Cs-137 and U-235 were the most commonly detected radionuclides in the boring. Cs-137 activity levels ranged from 386 pCi/g in the surficial sample to a maximum of 1,190 pCi/g in the 0.6 to 1.2-m (2 to 4-ft) sample before decreasing to 1,130 pCi/g, 196 pCi/g, and 2.15 pCi/g in the 1.2 to 1.8-m (4 to 6-ft), 6.1 to 6.7-m (20 to 22-ft), and 9.1 to 10.3-m (30.0 to 33.9-ft) samples, respectively. U-235 was not detected above background in the surficial sample, ranged from 0.011 to 0.014 pCi/g in the intermediate-depth samples, and then dropped to below background levels in the 9.1 to 10.3-m (30.0 to 33.9-ft) sample. Sr-90 was not detected in any near-surface samples but was detected at 58.3 pCi/g in the 9.1 to 10.3-m (30.0 to 33.9-ft) sample from just above the soil/basalt interface. A detailed description of characterization activities is available in the OU 3-09 Track 2 Summary Report (INEL 1995) and a list of analytical data from site CPP-10 is available in Appendix A.

1.4.4.3 Remedial Action Decision. Activity levels for Cs-137 exceed remediation goals of 23 pCi/g. Excavation of contaminated soils followed by backfilling using clean backfill will be required.

1.4.5 CPP-11, CPP-603 Sludge and Water Release

1.4.5.1 Description. Site CPP-11 is the result of a surface spill of CPP-603 fuel storage basin sludge and liquids. The release covered an area of 8.5 × 17.1 m (28 × 56 ft) and is directly over the VES-SFE-106 tank that is housed in a concrete vault (DOE-ID 1997b). The top of the vault lid is approximately 4 ft bgs. It was reported in February of 1978 that between 1,136 to 1,893 L (300 to 500 gal) of waste-containing sludge and basin water were released to the ground during basin cleanup activities. Reports of the spill indicate that localized areas having radiation levels of 1 R/hr or greater were removed immediately. The remainder of the area was reportedly cleaned up at a later time. The contamination present today in the soils above the VES-SFE-106 tank is suspected to be present from small spills associated with sludge removal activities in recent years (DOE-ID 1997a).

1.4.5.2 Characterization History. As part of the OU 3-13 field investigation in 1995, samples were collected from three borings installed in the site. Samples were collected in order to estimate source volume and evaluate risks associated with contamination present (DOE-ID 1997a). Analytical results showed that Cs-137 was the most widely detected radionuclide in the samples collected. Surficial Cs-137

activities ranged from 23.7 ± 0.3 pCi/g to 28.5 ± 0.3 pCi/g. Cs-137 activities increased with depth to approximately 70 pCi/g in samples collected between 0.6 to 3.0 m (2 to 10 ft) before declining to between approximately 2 and 12 pCi/g. Eu-154 was detected in seven samples. Activity levels for Eu-154 ranged from 0.36 ± 0.8 pCi/g to 1.8 ± 0.2 PCi/g. Detections of Co-60 and Np-237 were isolated, and at activities of less than 1 pCi/g. Sr-90 was found in one sample, at an activity of 13.1 ± 0.3 pCi/g in a surficial sample. A detailed description of the sampling activities is available in the OU 3-13 RI/BRA (DOE-ID 1997a) and a list of analytical data from site CPP-11 is available in Appendix A.

1.4.5.3 Remedial Action Decision. Activity levels for Cs-137 exceed remediation goals of 23 pCi/g. Excavation of contaminated soils followed by backfilling using clean backfill will be required. Remediation activities of the VES-SFE-106 tank, located beneath site CPP-11, began in the winter of 2005. Current scope calls for sludge removal of the tank followed by removal of the tank and the concrete vault. Characterization and remediation effort for Site CPP-11 should be coordinated with scheduled activities for the VES-SFE-106 tank.

1.4.6 CPP-13, Pressurization of Solid Storage Cyclone Release Northeast of CPP-633

1.4.6.1 Description. Site CPP-13 resulted from the pressurization of the solid storage cyclone northeast of building CPP-633 where calcined, high-level waste was released to the air in 1976 (see Figure 1-8). While attempting to clear the solid storage cyclone (WC-912) of a restriction, the cyclone became over-pressurized and blew contaminated granular solids into the air. The release contaminated the roof of building CPP-747 located on the top of the concrete vaulted storage bin and the berm area to the northeast of CPP-747. The contamination encompassed a 28-m^2 (300-ft^2) area on the northeast berm covering Bin Sets 1 through 3. The bin sets contain high-level waste and, as a result, contamination in the area is masked by the high levels of radiation in the area. Subsequent cleanup efforts were successful in decontaminating the top of building CPP-747. However, the contamination over the berm area was left in place and covered with approximately 0.15 m (0.5 ft) of soil (DOE-ID 1997b).

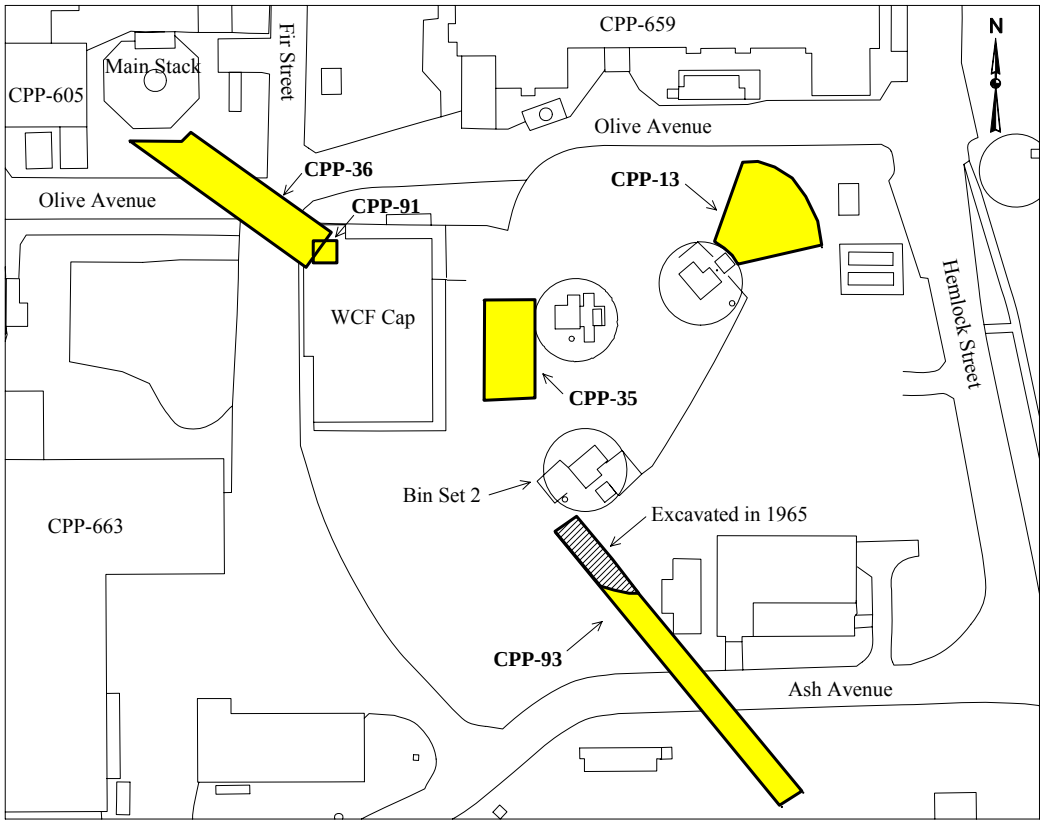


Figure 1-8. Sites CPP-13, CPP-35, CPP-36, CPP-91 and CPP-93.

1.4.6.2 Characterization History. Three borings were drilled at site CPP-13 as part of the OU 3-13 Remedial Investigation/Feasibility Study field sampling program in May 1995 (DOE-ID 1997b). Two borings were located at the top of the berm and the third near the base. Since 0.15 m (0.5 ft) of clean soil was placed on the earthen berm after the release, surficial soil samples were collected starting at 0.15 m (0.5 ft) bgs. Analytical data from the samples collected showed that Cs-137 and Sr-90 were the most widely distributed radioactive COPCs at site CPP-13. Cs-137 activities up to 47 ± 0.5 pCi/g were measured in surficial samples. Cs-137 activities of 3,710 ± 40 pCi/g and 4,630 ± 50 pCi/g were noted in one of the borings at the berm's top in the 0.15 to 0.3-m (0.5 to 1.0-ft) and the 0.8 to 1.2-m (2.5 to 4.0-ft) sample intervals, respectively. Sr-90 activities were measured at 4,180 ± 30 pCi/g and 2,600 ± 30 pCi/g in the same intervals. Eu-154 and Tc-99 were also detected in the same boring. Eu-154 activity increased with depth from 22 ± 1 pCi/g in the 0.15 to 0.3-m (0.5 to 1.0-ft) interval to 31 ± 2 pCi/g in the 0.8 to 1.2-m (2.5 to 4.0-ft) interval. Tc-99 activity decreased from 2.7 ± 0.4 pCi/g to 1.4 ± 0.4 pCi/g in the same interval (DOE-ID 1997a).

Based on the investigative results, Cs-137 and Sr-90 are considered the primary COPCs at CPP-13. Numerous other radionuclides were detected at activities above background; however, these detections were low levels and all below remediation goals. Results from a sample collected at the boring from the base of the berm indicated radionuclide activities had dropped to below background in the 2.4 to 3.0-m (8 to 10-ft) interval. The initial area of CPP-13, as described above, has been shifted to the west from the original FFA/CO location, based on the results of the borings, and is now believed to extend over an area of 366 m^2 (3,949 ft^2) (see Figure A-3 in Appendix A). A description of the investigation is presented in the OU 3-13 RI/BRA (DOE-ID 1997a) and the analytical results are available in Appendix A.

1.4.6.3 Remedial Action Decision. Activity levels for both Cs-137 and Sr-90 exceed the remediation goals. Excavation of contaminated soils followed by backfilling using clean backfill will be required.

1.4.7 CPP-14, Old Sewage Treatment Plant West of CPP-664

1.4.7.1 Description. Site CPP-14 is the site of a decommissioned Sewage Treatment Plant (CPP-715) that operated from 1951 to 1982. The treatment plant processed sanitary wastes from nine facilities at INTEC (then the Idaho Chemical Processing Plant). The treatment plant consisted of two Imhoff digestion tanks, a trickling filter, a chlorine contact basin, sludge drying beds, and a drain field (see Figure 1-9). Raw sewage was initially digested in the Imhoff followed by secondary treatment of the effluent in the tricking filter. The digested sludge was transferred to the sludge drying beds, while liquid effluent from the tricking filter was chlorinated and discharged to the drain field (DOE-ID 1999a). The site, located just north of the tank farm and south of Cypress Avenue, measures approximately 98 × 30 m (320 × 100 ft) at the surface and the treatment plants components and structures extended to as deep as 6.1 m (20 ft) below grade.

The sewage treatment facility was demolished as part of the Utility Replacement and Expansion Project to upgrade the INL facilities. Demolition was completed in September 1983 and reportedly consisted of:

- Removal of the wastewater treatment facilities and associated equipment to a depth of 1.5 m (5 ft) below grade
- Removal and disposal of remaining sludge in the drying beds
- Removal of buried piping, with the exception of the 0.3-m (1-ft) influent line and the 0.15-m (0.5-ft) effluent lines from the chlorine contact basin to the drain field.

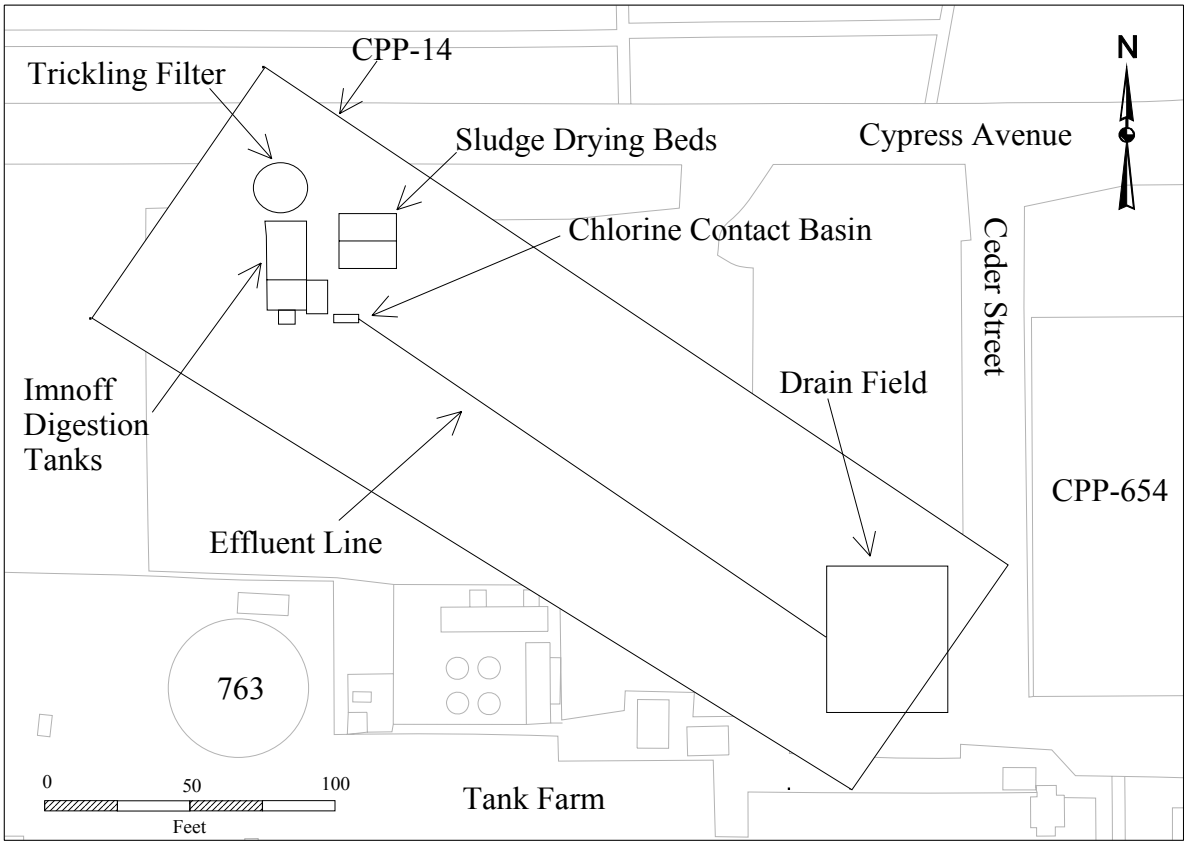


Figure 1-9. Site CPP-14.

The treatment facility was not designated to receive or process hazardous or radioactive wastes. However, during the removal and disposal of the sludges during the demolition project in 1982, the sludges from the drying beds were found to be contaminated with low-level radioactivity. As a result, the sludge from the drying beds was transported and managed at the INL Radioactive Waste Management Complex.

1.4.7.2 Characterization History. Characterization of the site was carried out in three phases. Phase I consisted of a series of geophysical surveys performed in the winter of 1990. The surveys were performed over the area to determine locations of structures within the sewage treatment facility so that borehole locations could be placed within the abandoned-in-place structures. Phase 2 was performed during the summer of 1991 and involved sampling during the excavation and removal of pipelines associated with the facility. Phase 3 consisted of borehole drilling and sampling performed in the fall and winter of 1991 (DOE-ID 1997a).

A total of 17 soil samples were collected for chemical and radiological analyses from five pipe excavations locations and 10 boreholes. Of these soil samples, five were collected as biased grab samples, and 12 as biased composites. Results from soil sampling were used to determine the presence or absence of radiological contamination at each area within the site's perimeter and to increase the overall reliability of the exposure concentrations for any contaminants detected in the soil. The analytical results, as described in the RI/BRA (DOE-ID 1997a) were divided into the three following areas:

- Imhoff Tanks – located in the northwest part of the site. This area was evaluated separately because the material under investigation at this location is remnant sludge most likely contained within the Imhoff Tanks with little or no migration outside of the tanks.

- Plant Site Area – located next to the Imhoff Tanks. This area consists of contamination in the remaining facilities: the tricking filter, ejector pit, final tank, chlorine contact basin, sludge drying beds, and associated piping. This area was evaluated separately because the material under investigation is soil and residual sewage treatment plant contaminants.

- The drain field – located in the far southeast end of the site. The drain field was evaluated separately because it is physically separated from the main sewage treatment plant facilities (approximately 54.9 m [180 ft]) from the main facility.

Based on the chemical screening conducted in the RI/BRA (DOE-ID 1997a), Table 1-1 shows the contaminants of potential concern for site CPP-14.

Table 1-1. Contaminants of potential concern for site CPP-14.

Imhoff Tanks	Plant Site	Drain Field
Aroclor-1260	Aroclor-1260	Arsenic
Benzo(a)pyrene	Cesium-137	Np-237
Cesium-137	Neptunium-237	Sr-90
Neptunium-237	Strontium-90	NA
Strontium-90	Uranium-234	NA
Uranium-235	Uranium-238	NA

NA = Not applicable due to depth of contamination.

A description of the characterization activities is contained in the RI/BRA (DOE-ID 1997a) and the Track 2 Summary Report Waste Area Group 3 Operable Unit 3-05 Old sewage Treatment Plant West of CPP-664 (WINCO 1993). Analytical data results, from samples collected down to ten feet, are listed in Appendix A.

The analytical results from the Imhoff Tanks are based on two samples collected of the sludge within the tanks. These samples were collected at depths ranging from approximately 3.0 to 3.6 m (10 to 12 ft) bgs. Organic COPCs found included Aroclor-1260, phenanthrene, and benzo(a)pyrene all at low levels. Aroclor was the only organic COPC detected in both samples at concentrations above 1.0 mg/kg. Radiological COPCs found in the samples were Cs-137, Np-237, Sr-90, and U-235. Of these, Cs-137 was detected at the highest activity levels, which were 6.21 ± 0.16 pCi/g and 4.94 ± 0.18 pCi/g. Neptunium was also detected at activity above 1.0 pCi/g in both samples.

The analytical results from the plant site are based on samples collected from 10 boreholes within the remaining tanks, basins, and sludge drying beds. These samples were collected at depths ranging from approximately 1.1 to 11.6 m (3.5 to 38 ft) bgs. Numerous inorganic, organic, and radionuclide COPCs were detected at concentrations/activities above background in these samples. Organic COPCs detections in plant site samples were limited to isolated detections of Aroclor 1254 and Aroclor 1260 and all detections were at concentrations below 1.0 mg/kg. Numerous radiological COPCs were detected in multiple plant site area samples, including Cs-137, Sr-90, U-234, U-238, and Np-237. Isolated detections of U-235 and Am-241 were also noted. Cs-137 ranged up to 3.89 ± 0.71 pCi/g and Np-237 was detected

at 5.5 ± 2.1 pCi/g. Maximum U-234 and U-238 activities of 6.89 ± 0.71 and 52.1 ± 1.97 pCi/g, respectively, were detected in a sample from approximately 9.8 m (32 ft) deep.

The analytical results from the drain field are based on samples collected from two boreholes within the drain field area. These samples were collected at depths ranging from approximately 4.6 to 13.1 m (15 to 43 ft) bgs. The target sample intervals in the drain field boreholes were just below the depth of the former drain field to the sediment/basalt interface (WINCO 1993). Arsenic was the only inorganic constituent detected above background in the three samples collected. Arsenic was detected at 8.6 mg/kg in one sample, which is slightly above background. Organic COPC detections were limited to phenanthrene at a concentration below 0.1 mg/kg. Radiological COPCs detected in samples from the drain field were Np-237 and Sr-90. Np-237 activity was less than 1.5 pCi/g and Sr-90 activity was less than 1.0 pCi/g in the samples in which they were detected.

1.4.7.3 Remedial Action Decision. In summary, contaminants of concern detected at site CPP-14 are below the remediation goals that have been established for the Group 3 soil sites for human health. The ecological risk assessment performed in the OU 3-13 BRA (DOE-ID 1997a) identified no contaminant that exceeded ecological target values at the Plant site. However, chromium, lead, mercury and silver were identified as COPCs at the Imhoff Tanks (Area 1) in the OU 3-13 BRA (DOE-ID 1997a). The toxicity, uptake and other input values used in the INL assessments were re-evaluated and modified to remove some conservatism in the OU 10-04 Work Plan (DOE-ID 1999b). Also, new information has become available from EPA for specific contaminations such as chromium (EPA 2005a), lead (EPA 2005b) and mercury (EPA 1997), and more detailed guidance (EPA 1999). Based on the availability of this updated information, this site was reevaluated in Engineering Design File (EDF)-6655, "Supporting Risk Evaluations for WAG 3 Group 3, Phase II RD/RA Work Plan," (ICP 2006a) for ecological risk. The maximum of the two data points taken at the 10-12 ft bgs from the sludge layer within the Imhoff Tanks was used. Initial screening indicated that chromium, copper, lead, mercury, silver, zinc and 4-chloroaniline exceeded ecological-based screening levels or EPA Ecological soil screening levels. A further assessment using the maximum values was performed (ICP 2006a). The results indicate that the Imhoff Tanks do not pose unacceptable risk to ecological receptors at the population level. Since Site CPP-14 does not contain COCs above remediation goals and does not pose an ecological risk, remedial action is complete and the site is a no further action site.

1.4.8 CPP-19, CPP-603 to CPP-604 Line Leak

1.4.8.1 Description. Site CPP-19 is the result of a leak in a waste transfer line to the north of building CPP-603 (see Figures 1-10 and 1-11). During the graveyard shift on March 9, 1978, a leak was discovered in the waste transfer line from the Basin Liquid Waste Tank (VES-SFE-106) near building CPP-603 to the Waste Evaporator Feed Tank (WL-102) in building CPP-604. The leak began at approximately 5:30 a.m. when the transfer pump was started to transfer 13,250 L (3,500 gal) of waste fluid. After the transfer was complete, the waste management operator notified the fuel storage operator that no liquid reached the storage tank (WL-102). The line was inspected during the day shift on March 9, 1978, by filling it with water and performing a hydrostatic test which forced water out the breach in the transfer line and up to the ground surface where it pooled. The water transfer line was constructed of 304 stainless steel that reduced from a 3.81 cm to 3.18 cm (1-1/2 to 1-1/4 in.) diameter and ran for 530 m (0.33 mi) at a depth of approximately 1.5 m (5 ft) bgs. The major area of contamination was estimated at the time to be approximately 10 m^2 (108 ft^2) on the surface. The waste transfer line was abandoned in place after the leak was discovered.

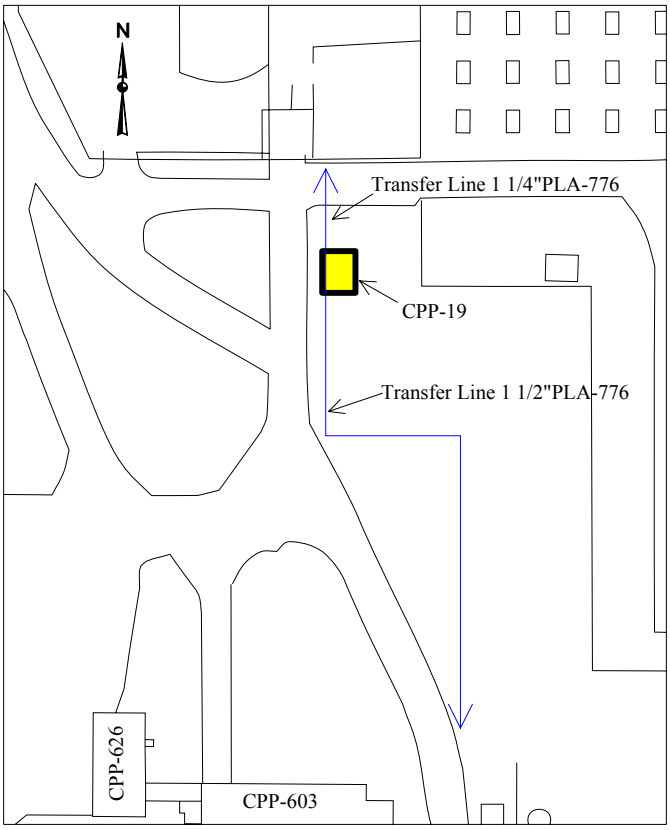


Figure 1-10. Site CPP-19.

1.4.8.2 Characterization History. Soil samples were collected from the area of contamination following the line rupture and analyzed for gamma-emitting radioisotopes. Total gamma activity was measured at approximately 2.2 uCi/g. Radionuclides detected were Ce-144, Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Eu-155, Nb-95, and Sb-125. Following the release, approximately 80 m^3 (2,825 ft^3) of contaminated soil was removed from site CPP-19, with the majority of the soil being removed from the area of highest contamination (approximately 10 m^2 [108 ft^2]). The remaining surface contamination was scraped off to a 0.15 to 0.23-m (6 to 8-in.) depth. Fifty-seven boxes of soil containing a total activity of 3 Ci were sent to the Radioactive Waste Management Complex for disposal. The entire area was reportedly backfilled with clean soil to reduce exposure levels to less than 0.5 mR/hr (DOE-ID 1997a).

As part of the OU 3-09 Track 2 investigation (INEL 1995), four borings were drilled at site CPP-19; one at the approximate location of the release, one each on the north and south ends, and the forth was drilled north of the site along the abandoned transfer line. Soil samples were collected and analytical results from these samples are available in Appendix A. Samples from the single boring drilled at the location of the release site indicated high activity levels for a number of radionuclides, particularly in the 1.2 to 1.8-m (4 to 6-ft) interval. Radionuclides detected in the interval include Am-241, at 1.97 pCi/g, Co-60 at 21,600 pCi/g, Cs-137 at 408,000 pCi/g, Eu-152 at 87,600 pCi/g, Eu-154 at 53,500 pCi/g, Eu-155 at 9,620 pCi/g, Pu-239 at 141 pCi/g, and Sr-90 at 125,000 pCi/g. Cs-137 was the most widely distributed radiological contaminate in the remaining borings at site CPP-19 with activities ranging up to 11.5 ± 0.2 pCi/g. Detection of radionuclides was generally limited to near-surface samples in the remaining borings [shallower than 1.2 m (4 ft)].

1.4.9 Remedial Action Decision

Based on investigative results, numerous radionuclides were identified as COPCs for site CPP-19 and exceed the remediation goals. Cs-137, Sr-90, and isotopes of Europium are the most widespread of the COPCs and are found at the highest activity levels. Using these results, site CPP-19 is estimated to be 306 m^2 (3,300 ft^2). Excavation of contaminated soils followed by backfilling using clean backfill will be required.

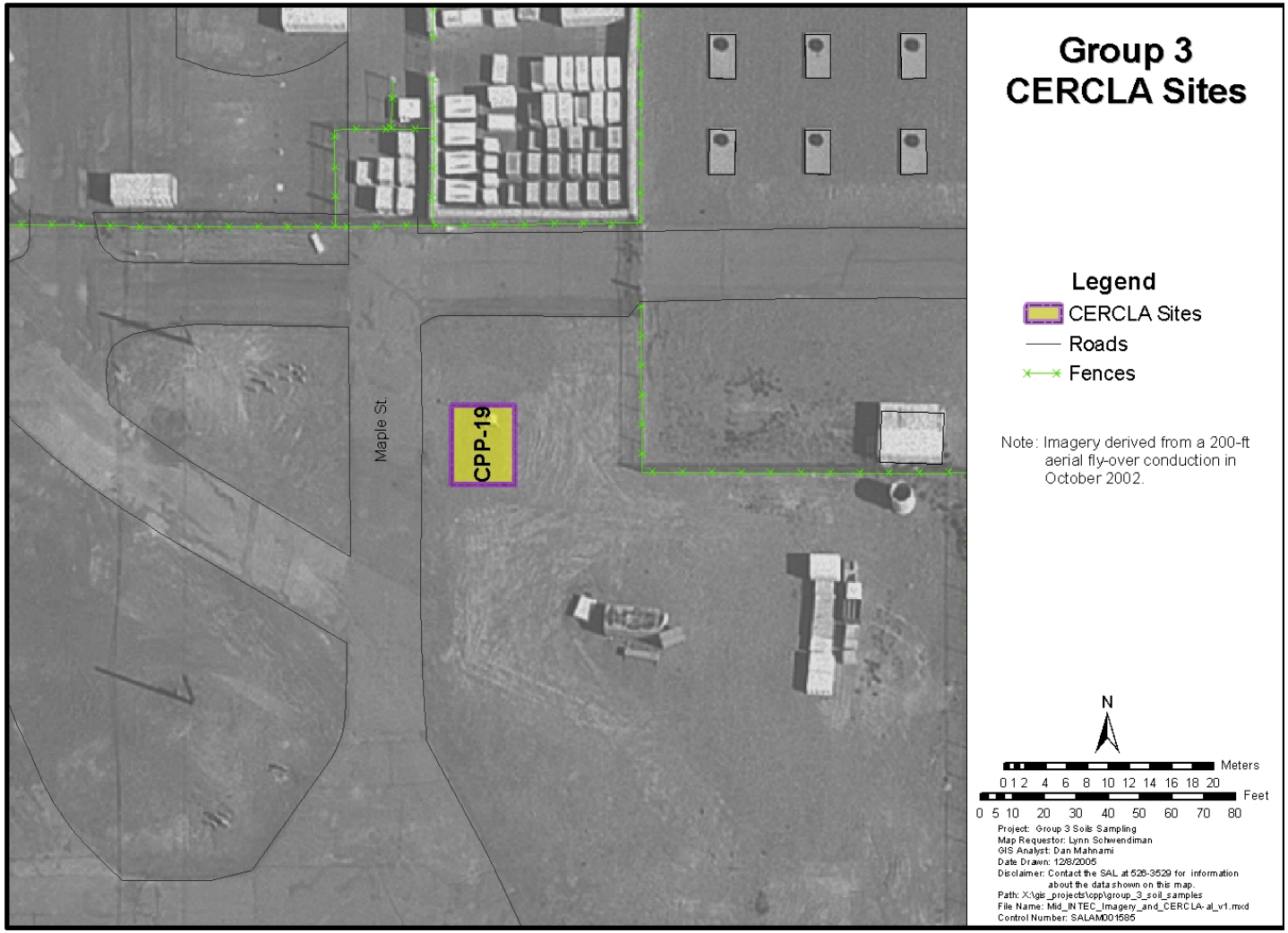


Figure 1-11. Group 3 CERCLA Sites.

1.4.10 CPP-35, CPP-633 Decontamination Spill

1.4.10.1 Description. Site CPP-35 (see Figure 1-12) is the result of a release of decontamination solution through the air transport system during the decontamination operation of calcine vessel WC-102 on May 16, 1972. The release, estimated at approximately 38 L (10 gal) of solution, contained nitric acid, mercuric nitrate, heavy metals, fluoride, nitrates, and up to 10 Ci of radioactivity. This solution contaminated approximately 111 m^2 (1,200 ft^2) of soil just east of the Waste Calcining Facility cap (DOE-ID 1997b).

The cleanup undertaken after the spill involved the removal of approximately 7.5 Ci of activity in approximately 9 metric tons (10 tons) of gravel that was disposed of at the Radioactive Waste Management Complex. During the removal operation, the highest concentration of activity was located approximately 1.2 to 1.8 m (4 to 6 ft) from the end of the pipe (air transport system) and had penetrated greater than 0.6 m (2 ft) into the gravel. Following cleanup, the residual radiation levels in the soil were generally in the range of 5 to 25 mR/hr with highs of 100 to 200 mR/hr. It was estimated that approximately 2.5 Ci of radioactivity remained at the site (DOE-ID 1997a).

1.4.10.2 Characterization History. Following the release, samples were collected of the contaminated soil. Table 1-2 shows the radionuclide abundances from the analyses of the soil.

Table 1-2. Radionuclide abundances.

Radionuclide	Percent
Sr-90	31
Ru-106	2
Cs-134	4
Cs-137	55
Ce-144	8

Based on these results, only Sr-90 and Cs-137 would have a present day concentration that is detectable due to radioactive decay. It is estimated that approximately 1.4 Ci of these two isotopes may be present at the sited from this release (DOE-ID 1997a).

During the Track 2 investigation (WINCO 1993), two boreholes (CPP-35-1 and CPP-35-2) were drilled to collect soil samples for analysis and five screening boreholes (35-AD-1 through 35-AD-5) were drilled to collect subsurface measurements of beta-gamma radiation and organic vapors. The soil samples collected from the two boreholes were analyzed for target analytical list metals, fluoride, pH, nitrate/nitrite, and radionuclides.

Soil samples for laboratory analysis were collected from boreholes CPP-35-1 and CPP-35-2 with the sample intervals corresponding to the zones having the highest measured beta-gamma radiation. The results from these borings are summarized in Appendix A. Based on chemical screening in Section 5.2 of reference DOE/ID, 1997a, the following COPCs were identified for site CPP-35: Sr-90, Cs-137, Eu-154, U-235, Pu-238, Pu-239, and Am-241. In general, the higher levels of contamination were detected from the land surface to approximately 1.8 m (6 ft) bgs, with significantly lower contamination detected to a depth of 5.5 m (18 ft). Below a depth of 5.5 m (18 ft), the concentrations for contaminants were near, or below, background levels.

The gross alpha activity ranged from 3.65 ± 0.653 to 202 ± 24.3 pCi/g with the results from nine samples exceeding the background concentration of 20 pCi/g. The isotopic analysis for Sr-90 detected concentrations ranging from 7.52 ± 0.707 to 3,240 ± 25.8 pCi/g with the highest concentrations occurring at depths less than 1.8 m (6 ft).

The results from gamma analysis detected Cs-137 in all samples and Eu-154 in five of the samples analyzed. Cs-137 and Eu-154 were detected above background levels: Cs-137 concentrations ranged from 0.214 ± 0.017 to 8,640 ± 622 pCi/g and Eu-154 concentrations ranged from 0.318 ± 0.076 to 11.8 ± 0.937 pCi/g.

Other radiological COCs detected were Pu-238, Pu-239, and Am-241. Activities reached maximum levels of 13.2 ± 0.542, 0.725 ± 0.05, and 1.21 ± 0.08 pCi/g, respectively. None of these COCs were detected above background at depths below 2.1 m (7 ft).

Based upon results of the field radiation surveys from the five screening boreholes, it appears that elevated radiation levels, as high as 2.5 mR/hr, are present near the surface. These radiation levels decrease to near background levels (+ 0.1 mR/hr beta-gamma) at a depth of approximately 1.8 to 2.1 m (6 to 7 ft) bgs. The presence of shallow contamination is consistent with the surface release where some downward migration of contamination has occurred.

Sr-90 and Cs-137 are the most widely distributed COCs; maximum activities of these COCs range as high as 3,240 ± 25.8 pCi/g and 8,640 ± 640 pCi/g, respectively. Other radionuclides detected include Eu-154 and Pu-238, at maximum activity levels of 11.8 ± 0.937 pCi/g and 13.2 ± 0.54pCi/g, respectively.

1.4.10.3 Remedial Action Decision. Levels of both Sr-90 and Cs-137 exceed remediation goals. The zone of contamination at CPP-35 is estimated to be 6.1 m (20 ft) thick, extending from the ground surface down to 6.1 m (20 ft) bgs. The area of CPP-35 is approximately 150 m^2 (1,620 ft^2) (WINCO 1993). Excavation of contaminated soils followed by backfilling using clean backfill will be required.

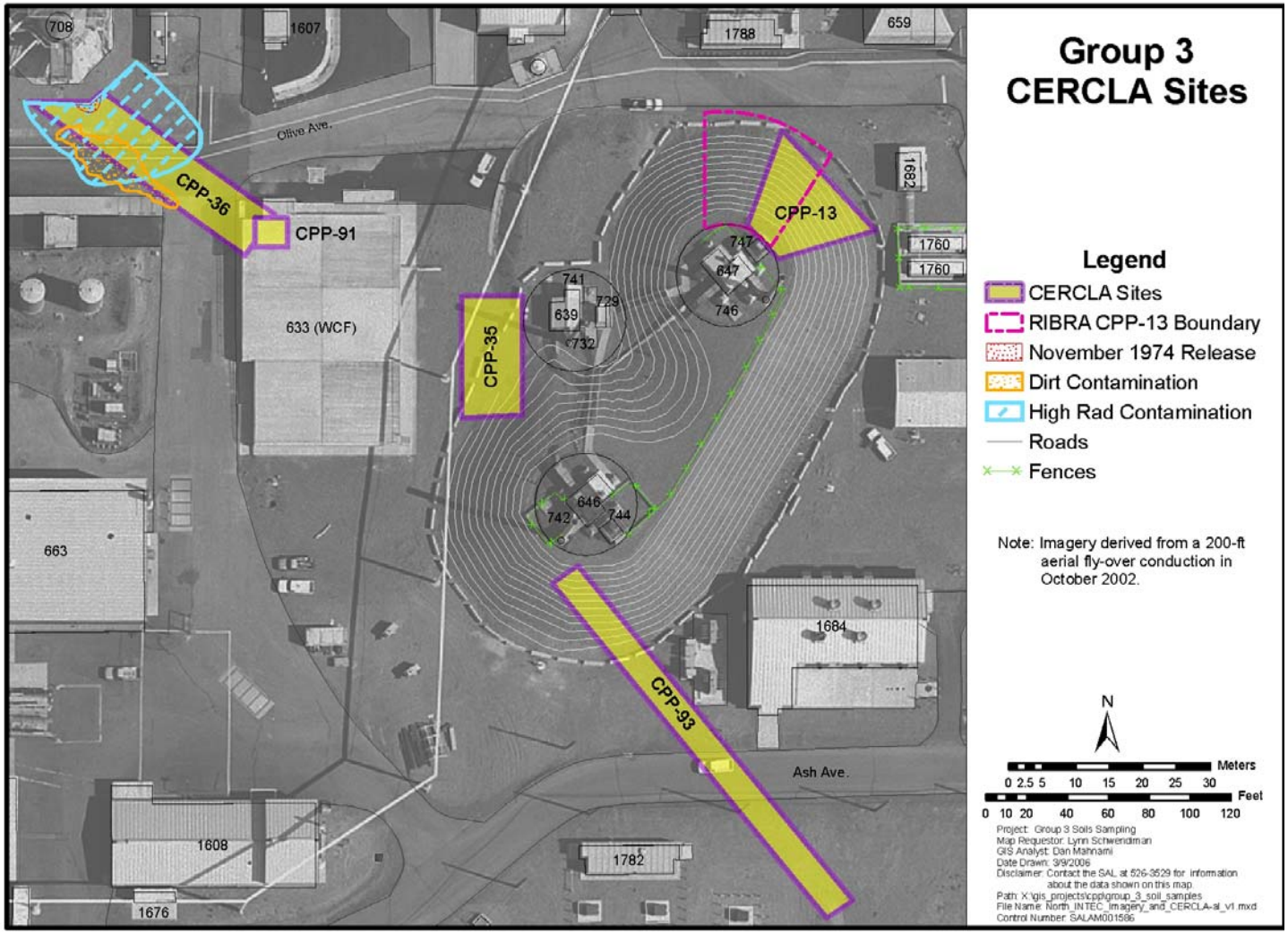


Figure 1-12. Group 3 CERCLA Sites.

1.4.11 CPP-36, Transfer Line Leak from CPP-633

1.4.11.1 Description. Site CPP-36 is the result of at least three separate releases that were discovered on four different occasions (DOE-ID 1997a). A summary of the historical releases at this site is:

- In May 1968, site workers were contaminated while digging near the main stack. The depth of the contamination encounter was not documented; however, the ensuing investigation suggested that the contaminated soil may have been the result of an earlier leak from a nearby contaminated pipe.

- In 1970, the calciner off-gas lines between the Waste Calcining Facility and the main stack were excavated and highly contaminated soil (up to 20 R/hr) was encountered at a depth of 1.8 m (6 ft) beneath Olive Avenue. Contaminated soil was reportedly excavated from the site and disposed of at the Radioactive Waste Management Complex and clean fill was brought in as backfill.

- In October 1974 contaminated soil was again encountered under Olive Avenue during an excavation for installation of replacement process solution and process high-level waste lines. It was believed that the contamination was the result of waste that flowed out of a model orifice corroded by nitric acid.

- In November 1974, 2,840 L (750 gal) of solution containing an estimated 4 Ci of total activity leaked in valve pit MAH-OGF-P-04.

The site, which extends from the main stack to the Waste Calcining Facility cap is approximately 302 m^2 (3,250 ft^2) of soil, and extends to a depth of 3.7 m (12 ft) bgs. The contamination includes radionuclides, nitric acid, mercuric nitrate, volatile organic compounds, and heavy metals (DOE-ID 1997b).

1.4.11.2 Characterization History. A Track 2 investigation involved installing seven observation wells to measure subsurface radiation levels and the drilling and sampling of two boreholes (WINCO 1993). The seven observation wells were installed throughout the site to better define the extent of contamination. These observation wells were installed at depths ranging from 3.2 to 12.6 m (10.5 to 41.3 ft) bgs. Boreholes CPP-36-1 and CPP-36-2 were then drilled to 3.6 m (11.8 ft) and 4.7 m (15.5 ft) bgs, respectively; and were drilled adjacent to observation wells CPP-36-OW-1 and CPP-36-OW-2 respectively. Samples from the boreholes were analyzed for selected metals, nitrate and nitrite, fluoride, pH, and radionuclides. The results of the analyses are summarized in Appendix A.

Gross alpha activity in the samples collected from the boreholes ranged from 8.43 to 27,500 pCi/g. The results from four samples exceeded background (20 pCi/g). Elevated alpha activity was detected in one sample from borehole CPP-36-1 between 3.0 to 3.6 m (10 and 11.8 ft) bgs, and in three samples from CPP-36-2 between 3.0 to 3.6 m (10 to 12 ft) bgs, 3.6 to 4.0 m (12 to 13 ft) bgs, and 4.3 to 4.6 m (14 to 15 ft) bgs. Isotopic analysis of these samples detected U-234, U-235, U-238, Pu-238, Pu 239; and Am-241, U-238, and U-234 concentrations were near normal background values (1.3 pCi/g each) in all samples. Gross beta activity ranged from 78.7 to 251,000 pCi/g the results from all samples exceeded background 30 pCi/g). Isotopic analysis detected Sr-90 at concentrations between 11.4 and 51,300 pCi/g.

Gamma analysis detected K-40 and Cs-137 in all samples, and Eu-154 in all samples except one. K-40 levels were at expected background values. Cs-137 concentrations ranged from 20.4 to 408,000 pCi/g, and all samples were above background (1.08 pCi/g). Eu-154 concentrations varied from 0.11 to 4,740 pCi/g with the higher Eu-154 concentrations correlating with the higher concentrations from other gamma-emitting isotopes.

Low activity Cs-137 contamination is widespread in the shallow soils at this site. Cs-137 concentrations at least 20 times the background concentration were found in all soil samples collected during the Track 2 investigation. The observation wells show gamma radiation levels up to 11 mR/hr in the uppermost 3.0 m (10 ft) of soil. This would equate to approximately 1,800 pCi/g of Cs-137 in the soil (DOE-ID 1997a).

High activity Cs-137 contamination is also present, but appears to exist at depths greater than 3.0 m (10 ft) bgs. The high level of Cs-137 contamination is likely from multiple sources, but may have coalesced into a continuous layer of contaminated soil. Four of the observation wells installed during the Track 2 investigation encountered radiation levels of 600 to 3,700 mR/hr at depths greater than 3.0 m (10 ft).

1.4.11.3 Remedial Action Decision. The zone of contamination is assumed to extend from the ground surface to the soil/basalt interface at about 12.8 m (42 ft). This depth is based on large activity levels measured in the deepest samples collected from boring CPP-36-1 and CPP-36-2. Results from the observation wells showed elevated radiation levels to at least 7.6 m (25 ft) bgs.

The boundary of site CPP-36 has been extended to the southeast to the Waste Calcining Facility cap boundary to capture potential lateral migration of contaminants from site CPP-91 (DOE-ID 1997a). Investigative results indicate contamination at CPP-91 to be indistinguishable from that from site CPP-36. The revised area of site CPP-36 is about 748 m^2 (8,052 ft^2) in size. Excavation of contaminated soils followed by backfilling using clean backfill will be required.

1.4.12 CPP-37B, Gravel Pit 2

1.4.12.1 Description. Site CPP-37B consists of Gravel Pit 2 which is located in the northeast corner inside the INTEC security fence. Before being backfilled, the pit was approximately 79 m (260 ft) wide, 116 m (380 ft) long, and 7.9 m (26 ft) deep. Before 1982, this pit was often used for the disposal of water released from the sludge dewatering pit of the old Sewage Treatment Plant (CPP-715). The exact volume of water effluent discharged to this gravel pit is unknown, but the volumes are believed to be low. The sludge from the dewatering pit was known to be radioactively contaminated, indicating the water discharged to the pit was likely to have contained radionuclides (DOE-ID 2004a).

After 1982, the pit was used to dispose of construction debris, some of which may have been radioactively contaminated. Anecdotal information suggests that Pit 2 may have also been used for the disposal of chemical wastes. Additionally, the pit was open in 1964 when the release of radioactive steam associated with Site CPP-26 occurred. Radioactive steam containing Cs-137 was released from a decontamination header in the High-Level Liquid Waste Tank Farm. The year this pit was backfilled is unknown, but it is believed to have been backfilled to grade shortly after its use as a construction debris landfill was discontinued.

The physical boundary, shown in the ROD, was based on historical knowledge, the 1980 topographical survey (GAI 1992), and the 1991 geophysical survey. However, when reviewing CERCLA documents and aerial photos related to Site CPP-37C, it was determined that the CPP-37B boundary identified in the WAG 3, OU 3-13 ROD does not accurately reflect the full extent of the excavation pit that was used for disposal. Thus, the boundary of CPP-37B was expanded to include the outer limits of the pit area.

1.4.12.2 Characterization History. Soil samples were collected from four boreholes (CPP 37-1, -2, -3, and -4) in Pit 2 in 1991 (GAI 1992 and INEL 1995). Before drilling and sampling Pit 2, however, a geophysical survey was conducted to determine the lateral extent and deeper portions of the backfilled pit.

Based on the geophysical survey results, three boreholes were drilled to the top of basalt in the deeper areas of the former pit. A fourth borehole was drilled to the first sedimentary interbed at approximately 34 m (110 ft) bgs and completed as a perched water monitoring well, CPP-37-4. Samples were not collected at depths less than 1.5 m (5 ft) due to the presence of backfill in the pit. The samples were analyzed for inorganics, volatile organic compounds, semivolatile organic compounds, pesticides/herbicides, polychlorinated biphenyls (PCBs), and radionuclides.

The data, summarized in Appendix A, indicate that arsenic, barium, chromium, mercury and silver were detected above background concentrations (Rood et al. 1995) in one sample from borehole CPP 37-4. Silver was also detected above background concentrations in one sample from borehole CPP 37-3.

Analyses were performed for a limited number of organics, including acenaphthene, anthracene, aroclor-1254 and -1260, benzo(a)anthracene, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, fluorine, kepone, methylene chloride, phenanthrene, and pyrene. Of those detected, none exceeded the ICDF waste acceptance criteria.

Radionuclides detected above background in soil samples collected in Pit 2 were Am-241, Cs-137, Pu-238, Sr-90, and U-238. Other radionuclides that have no background value were detected including (maximum concentrations in parentheses) I-129 (1.57 pCi/g), Np-237 (0.86 pCi/g), and U-235 (0.07 pCi/g). Cs-137, Np-237, and Sr-90 were detected most frequently in the samples from the four boreholes. Concentrations of Cs-137 and Sr-90 typically decrease with depth below the base of the fill at 6.4 to 7.9 m (21 to 26 ft). Cs-137 was not detected above background below a depth of 6.1 m (20 ft) while Sr-90 was detected in several samples below a depth of 6.1 m (20 ft) bgs. The presence of Sr-90 and not Cs-137 in the deeper samples is likely due to the increased mobility of Sr-90 relative to Cs-137. The only radionuclide detected was Sr-90 in two of the four borings at Pit 2, between a depth of 6.1 m (20 ft) and the top of basalt. No radionuclides were detected in the sample from the 109-ft interbed beneath Pit 2.

From September 28 through October 12, 2005, additional characterization activities were performed at Site CPP-37B. The sampling included the collection of 10 soil samples from boreholes (from ground surface to 35 feet bgs) and from the excavation of four trenches approximately 30 feet long and 10 feet deep for laboratory analysis. Debris samples were collected from each trench for visual inspection and were also analyzed for Cs-137, using a portable High Purity Germanium Detector.

The physical sample analysis performed in the laboratories included radionuclides and metals in accordance with the *OU 3-13, Group 3, Other Surface Soils Remediation Sets 1-3 (Phase I) Characterization Plan*, (DOE-ID 2005b). Specific compounds analyzed for included Am-241, Cs-137, Eu-152, Eu-154, Nd-237, I-129, Pu-238, Pu-239/240, Pu-241, Sr-90, Tc-99, tritium, U-234, U-235, U-238, chromium, and mercury. Results for COCs as identified for Group 3 soils were significantly below remediation goals. The highest reported results for Cs-137 and Sr-90 were 2.36 pCi/g and 4.15 pCi/g respectively, and results for Eu-152, and Eu-154 were nondetect. Chromium was detected in all samples with the highest reported result of 27.4 mg/kg. Mercury, Tc-99, and Nd-237 were not detected in any of the samples. Details of the characterization activity and analytical results are available in the *Operable Unit 3, Group 3, Other Surface Soils, CPP-37B and CPP-37C Characterization Results Report*, (ICP 2005b).

1.4.12.3 Remedial Action Decision. A risk assessment of these sites is presented in EDF-6655 (ICP 2006a). As discussed in EDF-6655, this assessment screened the maximum concentrations from the 0 to 10-ft depths for each detected contaminant in the soil against background and accepted risk-based concentrations (VanHorn and Stacey 2004). CPP-37B was screened for ecological receptors. At CPP-37B, maximum soil concentrations screened on the initial screen against background or 1E-06 or Hazard

Quotient = 0.1 risk-based concentrations for human receptors except for Am-241(for one detection) and Pu-241. The maximum concentration of Am-241 was eliminated at the next screening using the 1E-05 risk-based concentration for human health. The maximum concentration of Pu-241 exceeds the 1E-05 risk but is below the 1E-04 risk level that would be used for cleanup and is therefore eliminated as a concern. The maximum concentrations of both Am-241 and Pu-241 were eliminated at the next screening using the 1E-05 risk-based concentration for human health. Therefore concentrations of contaminants at these sites do not pose unacceptable risk to either human or ecological receptors.

Remediation goals for site CPP-37B are below action levels and the results of the ecological evaluation shows that the site does not pose a risk to the environment. Remedial action is complete for this site. Site CPP-37B is a No Further Action site.

1.4.13 CPP-37C, Construction Debris

1.4.13.1 Description. Site CPP-37C, a new site established in 2002 (see Figure 1-13), includes contamination discovered in November 2000, southeast of CERCLA Site CPP-37B while digging a trench along the fence near the east perimeter road. This contamination included construction debris (mostly lava rock, gravel, soil, and minor amounts of concrete, plywood, pipe, and plastic) located approximately 5 to 6 ft bgs down to below the bottom of the excavation (approximately 14 ft) and appeared to be most prevalent on the west edge of the trench (DOE-ID 2004a).

Based on a review of aerial photos and discussions with personnel familiar with this area, it has been determined that this area was used to dispose of construction debris, some of which was radionuclide-contaminated. As with other Group 3 sites, the primary contaminants of potential concern from this newly discovered site are the radiological constituents. Additionally, because releases for this site are not associated with process equipment waste evaporator waste, I-129 is not expected at a detectable concentration.

The physical boundaries for Site CPP-37C have been defined through the use of aerial photos and topographical surveys. The INL aerial photographs indicate that the site boundary is bounded on the east by the East Perimeter Road, on the south by internal INTEC access roadway system, on the west by CPP-37B, and on the north by CPP-37B northern limits.

1.4.13.2 Characterization History. Radiological scans, surveys, and sampling were performed on the contaminated materials removed from the excavation. The scans ranged from 1,600 to 100,000 counts per minute with a Ludlum 2A survey instrument.

Piping and soil was sampled for total metals, total volatile organic compounds, total semivolatile organic compounds, polychlorinated biphenyls, asbestos, radionuclides, and pesticides. Sample results showed that soil and debris to be primarily uncontaminated, with a small portion containing radiological contamination.

Contaminated materials that were segregated for management as CERCLA waste at the Staging and Storage Annex had radiological contamination in excess of limits for acceptance at the INL landfill at the Central Facilities Area. In addition, based on the sample results, the piping was assigned the EPA characteristic waste number for chromium (D007). Discarded lead shielding that was found had the EPA characteristic waste number of D008 assigned to this CERCLA waste. The surplus soil that had been removed during excavation was spread and scanned using a high-purity germanium detector. Soil that exceeded the OU 3-13 remediation goals was containerized for management as CERCLA waste at the Staging and Storage Annex.

From September 28 through October 12, 2005, characterization activities were performed at Site CPP-37C. The sampling included the collection of 22 soil samples from a borehole (from ground surface to 35 feet bgs) and from the excavation of 3 trenches approximately 30 feet long and 10 feet deep for laboratory analysis. Debris samples were collected from each trench for visual inspection and were also analyzed for Cs-137, using a portable High Purity Germanium Detector.

The physical sample analysis performed in the laboratories included radionuclides and metals in accordance with the *OU 3-13, Group 3, Other Surface Soils Remediation Sets 1-3 (Phase I) Characterization Plan*, (DOE-ID 2005b). Specific compounds analyzed for included Am-241, Cs-137, Eu-152, Eu-154, I-129, Nd-237, Pu-238, Pu-239/240, Pu-241, Sr-90, Tc-99, tritium, U-234, U-235, U-238, chromium, and mercury. Results for COCs as identified for Group 3 soils were significantly below remediation goals. The highest reported results for Cs-137 and Sr-90 were 3.69 pCi/g and 4.63 pCi/g respectively, and results for Eu-152 and Eu-154 were nondetect. Chromium was detected in all samples with the highest reported result of 38.4 mg/kg. Mercury, Tc-99, and Nd-237 were not detected in any of the samples. Details of the characterization activity and analytical results are available in the *Operable Unit 3, Group 3, Other Surface Soils, CPP-37B and CPP-37C Characterization Results Report*.

1.4.13.3 Remedial Action Decision. Detected COCs at CPP-37C are below remediation goals and the results of the ecological evaluation (see Section 1.4.11.3) shows that the site does not pose a risk to the environment. Based on the 2005 characterization data, remedial action is not required for this site. Site CPP-37C is a No Further Action site.

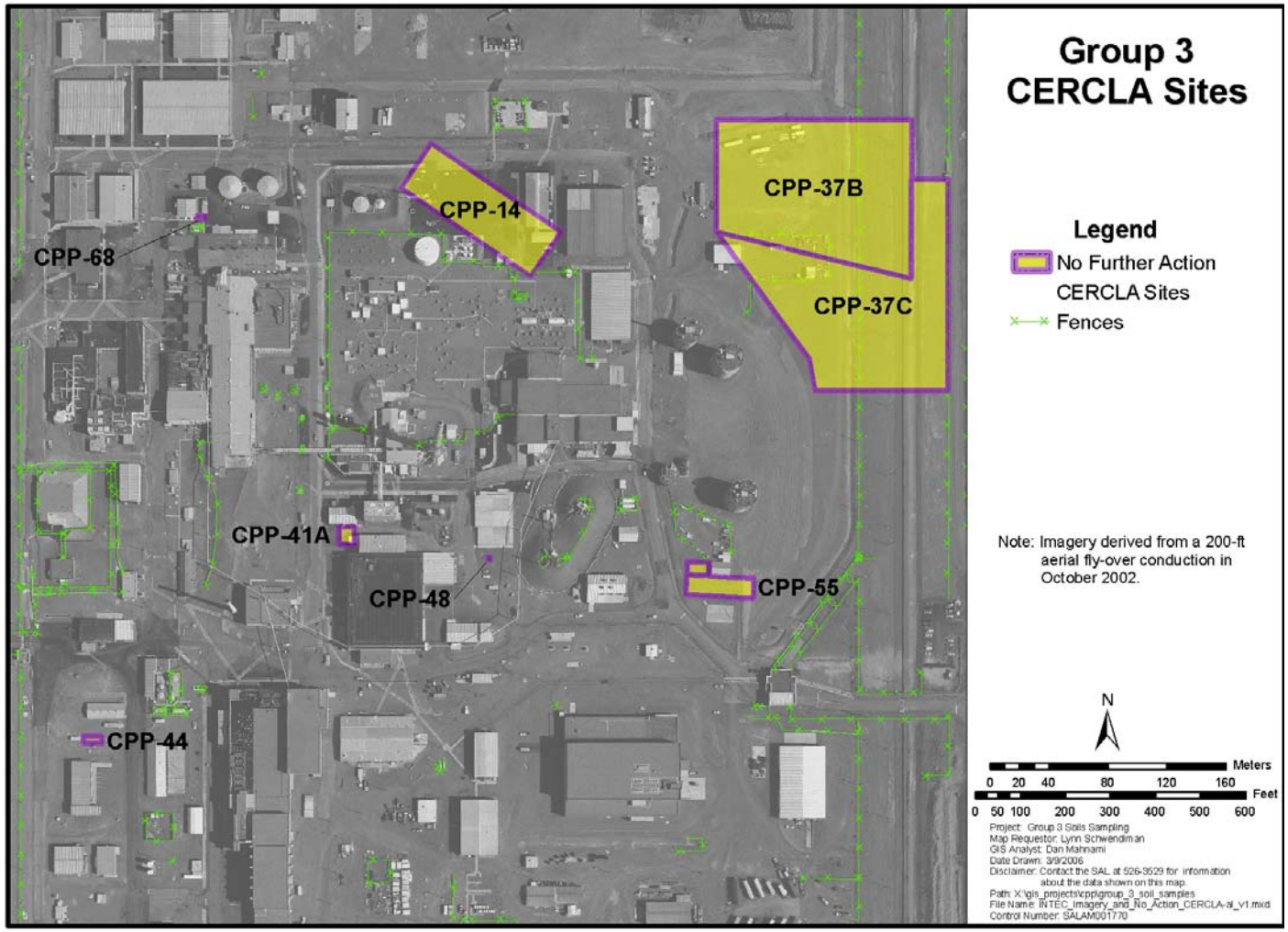


Figure 1-13. Group 3 CERCLA Sites.

1.4.14 CPP-41A, Fire Training Pits between CPP-666 and CPP-633, Under Asphalt

1.4.14.1 Description. Site CPP-41 is comprised of two separate the fire training pit areas located between buildings CPP-663 and CPP-666. During the construction of building CPP-666 in 1983, one of these training pits was completely excavated, eliminating any potential concern their might have been about its risk to human health and the environment. As a significant change from the proposed plan (DOE-ID 1998), the agencies decided during the finalization of the OU 3-13 ROD that the site should be split into two sites that will be designated CPP-41A and CPP-41B. The ROD declared Site CPP-41B (located near CPP-666) a no action site, stating that the risks posed by Site CPP-41B are less than 1×10^{-4} or a hazard index (HI) < 1. The ROD deferred the decision about Site CPP-41A to the RD/RA process.

Site CPP-41A, located northwest of building CPP-663, measures approximately 12 × 10.7 m (40 × 35 ft) and is where oils and organic materials were placed in metal drip pans (measuring approximately 2.4 × 2.4 × 15.2 cm [8 × 8 ft × 6 in.] deep) and ignited for fire brigade members to practice extinguishing the blaze (WINCO 1992a). The flammable material used was AMSCO 1241 (petroleum compound containing benzene, ethylbenzene, toluene, and xylene). Documentation describes that the fuel was placed in the drip pans and only a small amount might have escaped out of the pans during the training exercises. There are no records or other reason to suspect hazardous materials, other than ignitable fuels, were ever used in this fire training pit. The area was reportedly used to conduct training exercises two times a year in the summer months in the early to late 1960s (used no longer than eight or nine years). After this time, the training exercises were conducted at the Central Facilities Area. The site is currently covered by asphalt and is sufficiently close to building CPP-663 that it is suspected that location of 41A was completely excavated during the construction of building CPP-663 in 1980 (WINCO 1992a).

1.4.14.2 Characterization History. A Track 1 investigation was submitted on April 30, 1992, with the recommendation that no further action be taken at this site which was approved in January 1993 (DOE-ID 1997a). However, during the review and finalization of the OU 3-13 ROD, Site 41A was included as a Group 2 site (DOE-ID 1999a) for a decision to be made during the RD/RA. In 2000, it was transferred to Group 3, Other Surface Soils, in the Group 2 Building Drainage Evaluation Plan (DOE 2000b).

In a letter from DOE-ID to the U.S. EPA and Idaho Department of Health and Welfare in 1995 (Jenkins 1995), a Notice to Disturb Environmentally Controlled Areas was given that included plans to excavate through Site CPP-41A to install new utilities. Prior to the excavation in 1997, soil samples were collected to ensure that excavated soils were managed in accordance with CERCLA remedial action objectives and risk-based preliminary remediation goals (DOE-ID 1997c). Using a split spoon sampler driven to depth after augering through the asphalt pad covering the site, samples were collected from four locations at two different depths (0-1.5 ft and 1.5-3.0 ft) for a total of eight samples. The sample locations were randomly selected along the planned excavation route which evenly dissected site CPP-41A from east to west. The samples were analyzed for radionuclides, inorganics, organics, and total petroleum hydrocarbons. Results showed that Site CPP-41A does not contain radionuclides in excess of the 16.7 pCi/gm Cs-137 limit established in the Non-Time Critical Removal Action and does not contain RCRA hazardous waste (Falconer 1997). Results of the compounds contained in the flammable liquid used at the site (AMSCO 1241) during past training session showed that benzene, ethylbenzene, and xylene were not detected and toluene had a single detect that was reported as below the detection limit and marked as an estimated value. Results showing positive hits for both total petroleum diesel and gasoline were obtained; however, these can be attributed to the overlying asphalt pad and not associated with any past activities at the site.[h] In summary, no analytical results were reported above the remediation

h. Private communication with Richard P. Wells, CH2M-WG Idaho, LLC, Idaho Falls, Idaho, November 9, 2005.

goals and no AMSCO 1241 compounds were definitively detected (see Appendix A for list of analytical data).

1.4.14.3 Remedial Action Decision. Site CPP-41A does not contain any COCs above remediation goals and is not a threat to human health. A risk assessment of this site is presented in ICP 2006a. This assessment screened the maximum concentrations for each detected contaminant in the soil against background and accepted risk-based concentrations. All maximum soil concentrations screened on the initial screen against background or 1E-06 or Hazard Quotient = 0.1 risk-based concentrations for both human and ecological receptors except for benzo(a)pyrene (for one detection) and Ra-226 for human receptors and lead for ecological receptors. The maximum concentration of benz(a)pyrene was eliminated at the next screening using the 1E-05 risk-based concentration for human health. The Ra-226 was eliminated as being at background concentrations at this site. Further evaluation of the lead indicates that this one detection (18 mg/kg) out of eight that is above background (17 mg/kg) is not an ecological risk. Therefore concentrations of contaminants at this site do not pose unacceptable risk to either human or ecological receptors. No remediation/excavation is required for this site. Site CPP-41A is a No Action site.

1.4.15 CPP-44, Grease Pit South of CPP-608

1.4.15.1 Description. Site CPP-44 is a grease pit located north of building CPP-1619 that was used for the discharge of oils and grease from the vehicle service facility. The pit was in service from 1950 until 1953 when the Central Facilities Area construction was completed, after which construction vehicle maintenance was conducted at the Central Facilities Area. The grease pit consists of a concrete pad approximately 5.2 × 12.5 m (17 × 41 ft) in size. In the middle of this pad is a 0.9 m wide × 7.6 m × 1.7-m (3 ft wide × 25 ft long × 5.5-ft deep) trench. The trench walls are constructed of concrete block and the floor is poured concrete. In the bottom center of the trench is a sump measuring 1.0 × 0.85 m (3.25 ft × 2.8 ft) that has poured concrete sides with an open bottom to the underlying soils. After this grease pit was taken out of service, the trench was filled in and the concrete pad covered with soil.

1.4.15.2 Characterization History. In 1993, a Track 2 investigation was performed and soil samples were collected for laboratory analysis as the entire trench was excavated. The exact sample locations were not documented but one sample was collected from the surface soil overlying the pad, three from the grease pit trench, and two from the sump beneath the grease pit trench. External exposure to radionuclide contamination is not applicable because radionuclide wastes were not disposed of at this site and readings from handheld instruments during excavation detected no radiation above background (INEL 1994). Results from the investigation indicated low concentrations of chromium, lead, and mercury in the soils of the pit (DOE-ID 1997b). Results show that COCs are below the remediation goals and summary data are contained in Appendix A. After sampling, the trench was backfilled and the concrete pad was covered with approximately 0.76 m (2.5 ft) of soil.

1.4.15.3 Remedial Action Decision. Mercury is the only COPC detected at Site CPP-44 but at levels that are well below remediation goals and do not pose a risk to human health. Sample results obtained from this site have been evaluated to determine if their presence and concentrations have the potential to cause undesirable ecological effects. The ecological risk assessment performed in the OU 3-13 BRA (DOE-ID 1997a) identified chromium, lead mercury, nickel, and cadmium as COPCs at the CPP-44 area in the OU 3-13 BRA (DOE-ID 1997a). The toxicity, uptake and other input values used in the INL assessments were re-evaluated and modified to remove some conservatism in the OU 10-04 Work Plan (DOE-ID 1999b). Also, new information has become availability from EPA for specific contaminations such as cadmium (EPA 2005c), chromium (EPA 2005a), lead (EPA 2005b) and mercury (EPA 2001), and more detailed guidance (EPA 1999). Based on the availability of this updated information, this site was reevaluated in ICP 2006a.

The preliminary screening of the trench indicates that the maximum detected value of cadmium, chromium, lead, mercury, nickel and selenium all exceed either background or ecological screening levels. The preliminary screening of the sump indicates that the maximum detected values of cadmium, chromium, copper, lead, mercury, and nickel exceed either background or ecological screening levels. Further assessment of the maximum concentration at the sump and trench using the approach documented in the OU 10-04 Work Plan indicates that all HIs are less than 10 for ecological receptors. Only plants have an HQ greater than 1.0 (from mercury 2.28 at the sump and 1.28 at the trench) (ICP 2006a). The results of this reassessment indicate that CPP-44 does not pose unacceptable risk to ecological receptors. Remedial action/excavation is not required for this site. Site CPP-44 is a No Further Action site.

1.4.16 CPP-48, French Drain South of CPP-633

1.4.16.1 Description. Site CPP-48 was an excess chemical dump tank located south of the old Waste Calcining Facility (CPP-633) that was used as a French drain from 1975 to 1981 (herein referred to as dump tank). The dump tank was made of steel and measured approximately 1.5 m (5 ft) in diameter and 3.7 m (12 ft) long, with a lid and no bottom. The top of the dump tank stood approximately 0.6 m (2 ft) above the ground surface, with the tank bottom at 3 m (10 ft) bgs. As part of the calcining process, nitric acid and other chemicals consisting primarily of aluminum nitrate and calcium nitrate used in the calcining process were disposed into CPP-48. The chemicals and radionuclides released to the dump tank were not treated or neutralized before percolating into the soil matrix through the bottom of the tank. A portable above-ground disposal line was used to discharge effluent to the dump tank.

Prior to the installation of an excess chemical dump tank, CPP-48, in 1975, waste chemicals were disposed directly to the soil in a trench-like depression located at the dump tank site. The trench is approximately 3 × 1.5 × 0.3 m (10 × 5 × 1 ft) in size. From 1975 to 1981, chemicals from the calcining process were disposed directly to the CPP-48 dump tank. The above ground piping used to move calcining effluent from CPP-633 to CPP-48 was a flexible hose that, when not in use, was rolled up and stored in CPP-633. In August 1993, the dump tank was dismantled, packaged, and removed to the Waste Experimental Reduction Facility.

Records indicate that the chemical disposal to CPP-48 was in low quantities (several gallons at a time). Through the years of operation, however, site personnel indicate thousands of gallons of waste effluent may have been disposed. No records were kept regarding the volume of effluent disposed or the constituents in the waste stream, but it is suspected the mercury, Cs-137, Sb-125, and Eu-155 may have been introduced to this site via waste chemicals from the calcining process.

1.4.16.2 Characterization History. In March 1991, a RCRA sampling program was conducted to characterize possible soil contaminants in the vicinity of the dump tank. Samples were collected from a boring drilled to 14 m (46.5 ft) bgs and analyzed for RCRA metals, pH, nitrite, and nitrate. Analysis indicated soil samples contained no detectable levels of the volatile organic compounds, semivolatile organic compounds, pesticides, dioxin/furan, or herbicides.

In July 1993, three boreholes were hand augered within one ft of the dump tank circumference to a depth of approximately 10 ft bgs and surveyed for radioactivity. Borehole 1 was north of the dump tank, Borehoe 2 was west of the tank, and Borehole 3 was to the southeast of the tank. Borehole 1 had the highest recording of 4,000 counts per minute at 1.2 ft bgs. The 4,000 counts per minute is approximately equivalent to 0.61 pCi/g, cesium-137 which is below the background concentration of 0.82 pCi/g. Boreholes 2 and 3 had radioactivity readings below background levels.

In August 1993, the dump tank was removed, cut into sections, packaged, and delivered to the Waste Experimental Reduction Facility for disposal. Three soil samples and one sludge sample were

taken at the bottom of the dump tank excavation (3 m [10 ft] bgs) and at (3.7 m [12 ft] bgs), to determine possible soil contamination in the underlying soil. Samples were analyzed for kerosene, volatile organic compounds, semivolatile organic compounds, RCRA metals, and radionuclides. Kerosene, volatile organic compound, and semivolatile organic compound constituents were not detected. Analysis for radionuclide contamination showed a Cs-137 concentration highest at 3.7 m (12 ft) bgs with 65 ± 1 pCi/g, an Sb-125 concentration of 5.3 ± 0.2 pCi/g at 3 m (10 ft), and the highest Eu-155 concentration of 0.67 ± 0.10 pCi/g at 3.7 m (12 ft) (DOE-ID 1999a). After sampling, the site was backfilled with excavated site soil and topped with clean soil. Analytical data from the two soil samples collected at the 3-m (10-ft) level is listed in Appendix A.

1.4.16.3 Remedial Action Decision. Site CPP-48 was previously included in the Proposed Plan as a No Further Action site based on the results of the RI/BRA. However, under the Consent Order and Compliance Agreement, Site CPP-48 retained a RCRA land disposal unit designation. Under the FFA/CO, units retaining a land disposal unit designation will be remediated under CERCLA. This was to ensure that the old Consent Order and Compliance Agreement sites would be evaluated in the CERCLA process and properly addressed. As a result, Site CPP-48 was to be remediated under the selected remedy for Group 3 (DOE-ID 1999a).

Cs-137 is the only COC present at Site CPP-48 at activities above remedial action objectives, however, the activities exist 12 ft bgs which exceeds the depth for required excavation/remediation. Sample results obtained from this site have been evaluated to determine if their presence and concentrations have the potential to cause undesirable ecological effects in ICP 2006a. The initial screening indicates that the maximum concentrations of contaminants at this site are all below background or screening levels except for fluoride and mercury. A further evaluation of these maximums using the approach documented in the OU 10-04 Work Plan (DOE-ID 1999b) indicates that all HQs are below 1.0. The results of this reassessment indicate that CPP-48 does not pose unacceptable risk to ecological receptors. Remedial action is not required for this site. Site CPP-48 is a No Further Action site.

1.4.17 CPP-55, Mercury Contamination Area South of CPP T-15

1.4.17.1 Description. Site CPP-55 is the result of the discarding of used paint solvents. In 1984, carpenters and painters were observed discarding used paint solvents adjacent to building CPP T-15. As reported in Reference 2 of the Track 1 Report (INEL 1993), this practice was assumed to have begun soon after the building was occupied in 1982 and that the practice occurred sporadically until being discovered and prohibited in 1984. There are no records of the incidents, beyond the 1984 observation, and the materials did not visibly stain the soil. The exact volume of paint solvents discarded to the soil is unknown, but is thought to be small volumes of less than 1 gal per occurrence (INEL 1993). Site CPP-55 consists of a 766 m^2 (8,250 ft^2) that contains detected contaminants that include lead, mercury, and chromium (DOE-ID 1997b).

1.4.17.2 Characterization History. During a study conducted in 1985, seven soil samples were collected in the area and analyzed for mercury. Results showed levels ranging from 48 to 236 parts per billion (ppb). Since heavy metals are a constituent of some paint pigments, the presence of mercury in the soil was attributed to the former paint solvent discarding practice. No processing or storage facilities, other than building T-15, had been in the immediate vicinity of the area from which contamination could have been contributed (INEL 1993). Site CPP-55 was characterized in late 1989 and early 1990 to determine if hazardous constituents (waste types most likely to exist in a mixture of paint diluted in paint thinner) were present above regulatory thresholds. Eleven borings were randomly located from the intersection points of a 3 × 3-m (10 × 10-ft) grid which was deemed appropriate in that the discharges were small quantities over a potentially broad area. Ten boring were continuously cored to a depth of 1.8 m (6 ft) and one boring was cored to a depth of approximately 37.5 m (123 ft) from which

soil samples were collected. Selected samples were analyzed for volatile organic compounds, metals, and radionuclides as well as the full 40 Code of Federal Regulations (CFR) 264 Appendix 8 and Target Compound List constituents. As summarized in the OU 3-13 ROD (DOE-ID 1999a), five inorganic hazardous constituents (arsenic, chromium, lead, silver, and mercury) were detected above background levels. The highest level detected for mercury was 5.2 mg/kg which was well below the remediation goal of 23 mg/kg. Sr-90 was the only radioactive contaminant detected but only found in soils at depths that exceeded 110 ft bgs. Three organic constituents: toluene, 4-methyl 2-pentanone, and bis (2-ethylhexyl) phthalate were detected in the volatile organic compound analyses. However, all three were eliminated from further consideration during the validation procedure because all three are recognized laboratory contaminants. A description of the characterization activity is located in Reference 2 of the Track 1 Report (INEL 1993) and a list of the analytical data are located in Appendix A, showing that COCs detected are below remediation goals.

1.4.17.3 Remedial Action Decision. Per the OU 3-13 ROD (DOE-ID 1999a), if the remediation goals at a Group 3 soil contamination site have been met, it is necessary to perform an evaluation of whether additional soil excavation is necessary to protect ecological receptors, based on the WAG 10 plant uptake treatability study. The data collected during the characterization process has been used to verify that the remediation goals for WAG 3 are protective of ecological receptors.

The ecological risk assessment performed in the OU 3-13 BRA (DOE-ID 1997a) identified arsenic, chromium, lead, mercury, nickel, selenium, and silver as COPCs at the CPP-55 area in the OU 3-13 BRA (DOE-ID 1997a). The toxicity, uptake and other input values used in the INL assessments were re-evaluated and modified to remove some conservatism in the OU 10-04 Work Plan (DOE-ID 1999b). Also, more detailed guidance (EPA 1999) and new information has become available from EPA for specific contaminations such as arsenic (EPA 2005d), chromium (EPA 2005a), lead (EPA 2005b), and mercury (EPA 2001). Based on the availability of this updated information, this site was reevaluated in ICP 2006a.

The preliminary screening of this site indicates that the maximum detected value of chromium, lead, mercury, nickel, and silver all exceed either background or ecological screening levels. Further assessment of the maximum concentration using the approach documented in the OU 10-04 Work Plan indicates that all HIs are less than 6.0 for ecological receptors. Only sage sparrow, pygmy rabbit, deer mouse and plants have an HQ greater than 1.0 (from mercury) (ICP 2006a). The results of this reassessment indicate that CPP-55 does not pose unacceptable risk to ecological receptors at the population level. Remedial action is not required for this site. Site CPP-55 is a No Action Site.

1.4.18 CPP-60, Paint Shop (Storage Building) at Present Location of CPP-645

1.4.18.1 Description. Site CPP-60 (see Figure 1-14) is where a small cinder block building (CPP-615) once stood measuring 12.2 × 6.1 × 4.6 m high (40 × 20 × 15 ft high.) on a concrete pad. The building was commonly referred to as a paint shop but was officially named the Chemical and Hazardous Material Storage Building where grease, solvents, and paints were stored. The building was constructed in 1953-54 and demolished in 1976 in preparation for the construction of the new Quality Assurance Building (CPP-645). The construction area of CPP-645 completely engulfed the footprint of the storage building and used concrete slab construction with grade beams and spread footing as its foundation which required full excavation of the construction site. The footings were from 1.1 to 1.2 m (3.5 to 4 ft) wide and placed approximately 1.2 m (4 ft) below grade.

1.4.18.2 Characterization History. A Track 1 Investigation (WINCO 1992b) was prepared for this site in 1992 to assess risk and determine the probability of the existence of contaminants from the possibility that solvents were discharged to the ground that were used to clean painting equipment and

hand tools. Potential COCs include only metals (e.g., lead and mercury from paints). Based on this investigation, the building did not contain a paint booth and there was no paint spraying done at this site. If any painting did occur, it would have been minimal touch up painting with a brush. Location and Utilities Plans Drawings for the area indicate that the storage building was supplied electrical, firewater and steam utilities but not potable water or sanitary waste. No dry wells or floor drains appear on the drawings and the Track 1 summary for the site states that, "there is no reason to suspect it had floor drains or any significant mechanical systems." Although it is suspected that paint and paint solvents may have been discharged to the soil at this location when equipment and hand tools were rinsed out, the Track 1 Report states that there is no evidence to confirm this (no documentation or eyewitness accounts). As stated in the Track 1 Report, "wastes are only suspected of being disposed of at this site and that it is probable that no contamination exists because the old building and concrete pad were removed and building CPP-645 was subsequently built at this location." The construction of CPP-645 obliterated any opportunity to find any undisturbed sampling locations and it is believed that this construction would probably have removed any contamination present. No records during demolition of CPP-615 and the subsequent construction of CPP-645 indicate the presence of a spill. No soil samples have been collected to confirm the existence or absence of contamination at this site.

1.4.18.3 Remedial Action Decision. Site CPP-60 is listed as a Group 2 site (soils under buildings and structures) in the OU 3-13 ROD due to its present existence under building CPP-645. The major issue posed by this Group 2 site is external exposure to contaminants if the building is removed (DOE-ID 1999a) since the existing building currently provides an adequate protection barrier. However, building CPP-645 is scheduled to be DD&D'd during the same time frame as the Group 3, Phase II soil sites are scheduled to be remediated. Since this site is the only Group 2 soil site to be exposed as a result of DD&D activities prior to 2012, the decision was made to include it in this Group 3, Phase II Work Plan. The OU 3-13 ROD has established remediation goals to be accomplished for Group 2 sites, divided between Pre-DD&D and Post-DD&D. Pre-DD&D goals have been met (e.g., maintaining the building to minimize moisture infiltration and unacceptable exposure to current workers). Post-DD&D remediation goals for this site will be met by addressing this site under the CERCLA Remedial Action pathway (i.e., including it in this Work Plan) as allowed under the direction of the document, Operable Unit 3-13 Group 2 Closure Evaluation Criteria and Checklist (DOE-ID 2000b).

However, no contaminated soils are known to exist. No physical evidence, or documentation, and no interviews with era site works has provided any indication that a release ever occurred at this site beyond suggesting that the possibility may exist. Although no analytical data for this site has been collected due to its inaccessibility (beneath building CPP-645) demolition activities of CPP-615 and the subsequent construction of CPP-645 would have eliminated any suspected source. Based upon the evidence, site CPP-60 is to be a "No Action Site." Visual inspections of the excavated area will be performed after the demolition of CPP 645 and findings will be reported at that time. Unless visual inspections indicate the presence of contamination, no physical sampling will be performed.

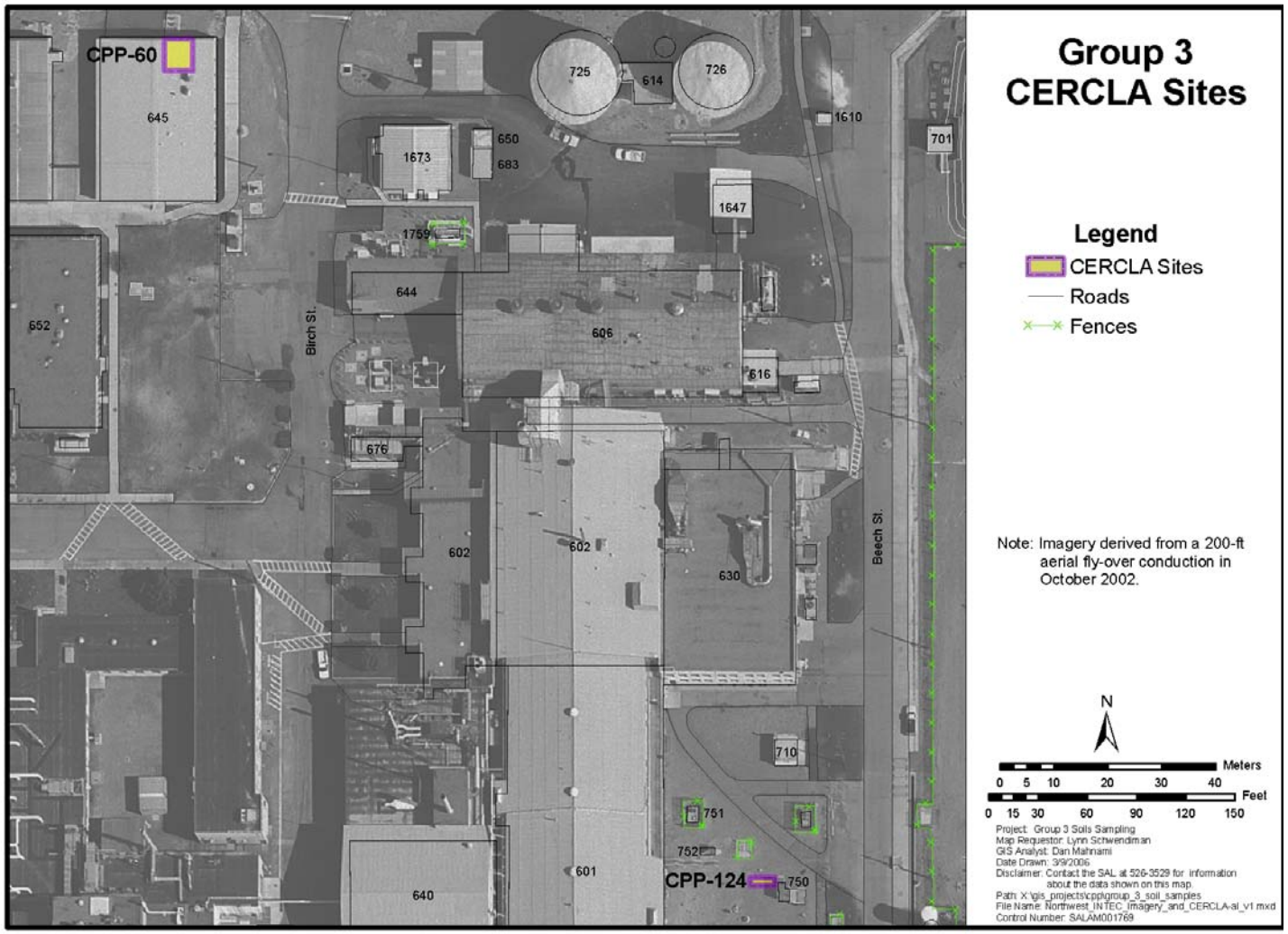


Figure 1-14. Group 3 CERCLA Sites.

1.4.19 CPP-68, Abandoned Gasoline Tank CPP-VES-UTI-652

1.4.19.1 Description. Site CPP-68 is the abandoned gasoline tank area located northwest of building CPP-606. The 1,893 L (500 gal.) underground tank (CPP VES-UTI-652) was taken out of service in June 1983 and removed in September 1986. During the exhumation of the tank, there was no visual evidence that the tank had leaked and there are no operating records prior to 1983 or records of spills associated with the operation of the tank.

1.4.19.2 Characterization History. Soil was collected at the site for analysis in 1986 and sample results indicated only trace amounts of gasoline constituents at concentrations within acceptable levels (small quantities of decane, benzene, toluene, and 3-methyl 2-pentanone). No Group 3 COPCs were detected or suspected of being present at this site. The Track 1 decision document (WINCO 1993), contained a No Further Action recommendation and was approved in April 1993 since the qualitative assessment of risk is low and extensive excavation has already occurred at the site (DOE-ID 1997a). However, the remedial action decision for CPP-68 was to be documented in the RD/RA Work Plan per the OU 3-13 ROD (DOE-ID 1999a).

1.4.19.3 Remedial Action Decision. Site CPP-68 contains no COPCs but does contain low levels of organic contaminants. A summary of sample results obtained from this site have been evaluated to determine if their presence and concentrations have the potential to cause adverse ecological effects.

The base on this tank was assumed to be approximately 8 to 12 ft below ground surface. Most tanks at the INL were buried below the frost line (approximately 3-4 ft) and a 500 gallon tank is approximately 4-5 ft in diameter. The two soil samples collected from below the tank were composited prior to being sent to the laboratory for analysis. The soil sample analysis report did not specify the concentrations of contaminants that were detected (WINCO 1993). With possible detections limits of 0.05 mg/kg, the results state that the sample was found to contain decane with smaller amounts of benzene and toluene. A trace of 3-methyl pentane was also identified. The laboratory report concludes that the characteristic components of gasoline were not detected (WINCO 1993). This may be due to the fact that xylene and ethylbenzene were not detected. Gasoline is a complex product, shown in 1986, to have 30.5% total aromatics including 3.2% benzene, 4.8% toluene, 6.6% xylenes, and 1.4% ethylbenzene (ATSDR 2002). No other Group 3 COPCs were suspected of being present at this site. The Track 1 decision document (WINCO 1993), contained a No Further Action recommendation and was approved in April 1993 since the qualitative assessment of risk is low and extensive excavation has already occurred at the site (DOE-ID 1997a). However, the decision for the site was directed toward the RD/RA as per the OU 3-13 ROD (DOE-ID 1999a) since this site is under a sidewalk from CPP-606 to CPP-1617.

This site was eliminated as a concern to the groundwater pathway in the 1993 Track 1 using the qualitative report from the laboratory (WINCO 1993). Since any possible contaminated soil would be below 10 ft in depth the only pathway of concern remaining is groundwater for residential human health scenario. The approach used in the Track 1 is acceptable since although the laboratory did not report the quantities they indicated that they were in very low amounts.

In review, decane was reported as having the highest concentration; however, no toxicity is available to evaluate this contaminant. Smaller amount of benzene and toluene are listed. Benzene is the more toxic of the two. These contaminants and their risk to groundwater were well known during this time and the levels of concern are similar to those in use today. The laboratory would, no doubt, have flagged any contaminant that they felt elevated levels of concern. Given the approach taken by the laboratory combined with the information that the tank does not appear to have leaked, it is unlikely that contaminants are at levels of concern for either ecological or human receptors. Remedial action is not required for this site. Site CPP-68 is a No Action site.

1.4.20 CPP-81, Abandoned CPP-637/CPP-601 Vessel Off-Gas Line

1.4.20.1 Description. Site CPP-81 is a 68-ft-long abandoned underground 3-in.-diameter vessel off-gas line. The line trends south at a depth of 2 to 3 ft below ground (area formerly occupied by Building CPP-620), then runs east toward Birch Street. The line became plugged in October 1986 with simulated, nonradioactive calcine during Test Run 15 of the Calcine Pilot Plant (DOE-ID 2003). In response, a new vessel off-gas line was rerouted around the partially plugged portion of the vessel off-gas line and activities continued. The line was cleaned out in September 1993 as a non-time-critical removal action and after removal of the simulated calcine solids, the line was flushed with 5 nitric acid washes and 14 water rinses. No leaks were observed during the removal action, indicating that no previous release to the environment had occurred during the 1986 Run 15 or during the flushing operation. Calculations using data collected during the removal were used to estimate the amount of simulated calcine removed from the line. Approximately 52 kg of simulated calcine were removed by dissolution. This removal of plugged material was confirmed when no solids were observed in the vessel off-gas line during the post-removal inspection (in-line video inspection). The upstream end of the abandoned vessel off-gas line was then capped and the downstream end of the line remained connected to the plant vessel off-gas system (DOE-ID 2001).

In 2001, the condition and status of CPP-81 was evaluated and a recommendation made that the site be a No Further Action site. All evidence indicated that no release had occurred at this site and that the potential threat of contamination in the pipe had been removed. This recommendation was presented in the *Explanation of Significant Differences for the Final Record of Decision of the Idaho Nuclear Technology and Engineering Center, Operable Unit 3-13* (DOE-ID 2003). The remedy for this site was changed from "requiring additional information for making a final determination" to "further evaluation has been completed. Retain in the OU 3-13 ROD as a no action site."

In 2005 the line was cut as part of the DD&D activities at CPP-637 and the location of the cut was approximately 3 ft outside the footprint of CPP-637. Soon after the cut was made, a laydown of moist material was discovered next to the cut which came from the cut pipe. A sample was collected and results indicated hazardous levels of cadmium and chromium. Based upon these new findings, CPP-81 was assigned to OU 3-13, Group 3 for remediation.

1.4.20.2 Characterization History. The simulated calcine from Test Run 15 contained cadmium and chromium. Based on process data, the line potentially was contaminated with zirconium, calcium, chloride, fluoride, potassium, sodium nitrate, sulfate, aluminum, boron, mercury, lead, hexone, tributylphosphate, AMSCO, U-238, U-235, cobalt, strontium, cesium, and cerium as nonradioactive nitrates. The initial acid wash in 1993 revealed cadmium and chromium concentrations of 465 ppm and 190 ppm, respectively. The final water rinse revealed concentrations of cadmium and chromium of 0.17 ppm and 0.11 ppm, respectively which were significantly below RCRA toxicity characteristic regulatory levels of 1.0 ppm cadmium and 5.0 ppm chromium. Laboratory analysis for suspected trace compounds were not conducted (DOE-ID 2001).

When the unexpected material was discovered inside the line in 2005, a sample and duplicate sample were collected from inside the line. The material was described as grey, putty-like wet material, similar to grout and was presumed to be calcine-like sludge. The samples were analyzed for the presence of several metals and the laboratory results showed that the cadmium, chromium, and silver upper confidence limit exceeded the Universal Treatment Standards non-wastewater regulatory limit. A list of analytical data are located in Appendix A.

1.4.20.3 Remedial Action Decision. Although no Group 3 COCs were identified that exceeded the remediation goals, sample results indicated that the levels for cadmium and chromium exceed RCRA

toxicity characteristic regulatory levels and require removal. The remaining vessel off-gas line and its contents will be excavated and managed as CERCLA waste.

1.4.21 CPP-91, CPP-633 Blower Pit Drain

1.4.21.1 Description. Site CPP-91 is the former building CPP-633 (Waste Calcining Facility) Blower Pit Drain and consists of contaminated soils from discharges from the drain at the base of a blower pit located on the north side of the Waste Calcining Facility. The blower pit was 4.16 × 2.72-m (13.67 × 8.92-ft) (inside dimensions) concrete vault located just below land surface (DOE-ID 1997a). It contained a drain that was believed to discharge directly to the sediments below the blower pit floor, which was approximately 3.1m (10 ft) bgs. In 1992, a cleanup of the blower pit was completed and it was sealed. A detailed description of the site including sampling activities and results are presented in Section 12 of document DOE-ID 1997a. Summary of analytical results are presented in Appendix A.

1.4.21.2 Remedial Action Decision. In 1998, this site was capped as part of the Waste Calcining Facility closure which was completed in November 1999 per the *Hazardous Waste Management Act Closure Plan for the Waste Calcining Facility at the Idaho National Engineering and Environmental Laboratory*, (INEEL 1997) (for further information on the Waste Calcining Facility cap, refer to IDEQ 2003). Figure 1-12 illustrates how entire site CPP-91 was completely covered by the Waste Calcining Facility cap. The Waste Calcining Facility was closed under an approved Hazardous Waste Management Act closure plan, which includes a post-closure monitoring and maintenance plan. Per the ROD, the Waste Calcining Facility was to be included during the CERCLA five-year reviews with the Group 2 Soils Under Buildings and Structures sites and address substantive requirements of Idaho Administrative Procedures Act (IDAPA) 16.01.05.008 (40 CFR 264.310) (landfill closure requirements). The ROD further stated that monitoring requirements will be incorporated into the post-ROD monitoring plan for OU 3-13. The Waste Calcining Facility cap is mentioned in the five-year review, but since the finalization of the ROD, Idaho Department of Environmental Quality has since required that post-closure care of the Waste Calcining Facility be include in the Hazardous Waste Management Act/Resource Conservation and Recovery Act program rather than CERCLA (DOE-ID 2005c). Subsequently, DOE Idaho submitted a Hazardous Waste Management Act/RCRA post-closure permit application that was approved by the State of Idaho. The post-closure permit requires periodic inspection and monitoring of the Waste Calcining Facility cap and routine monitoring of the groundwater. The rationale was made in the five-year review for Site CPP-85 (Waste Calcining Facility blower corridor that runs along the outside of the former Waste Calcining Facility) that as an OU 3-13 Group 2 site, this action (capping) is consistent with the remediation goals for the post-DD&D period to prevent exposure to future workers and residents and to minimize possible leaching and transport of contaminants. This same rationale can be applied toward site CPP-91. The structure (Waste Calcining Facility cap) limits infiltration of water through the contaminated soils and prevents direct exposure to the contaminated soils. The precise lateral extent of contamination from CPP-91 was not determined; however the expanded CPP-36 boundary (see Figures 1-7 and 1-12) is believed to incorporate any contamination associated with CPP-91, especially if drainage from the blower pit at site CPP-91 was primarily vertical rather than lateral (DOE-ID 1997a).

Capping of Site CPP-91 satisfies the remedy selected in the OU 3-13 ROD (soil removal or capping the soil in place pursuant to applicable land fill closure requirements to reduce the risk from external exposure to less than 1×10^{-4}). Post-D&D remediation goals, as identified in Section 8.1.2 of the OU 3-13 ROD, have been met since this site is capped with an engineered barrier meeting the requirements of HWMA/RCRA closure to a landfill standard. The selected remedy for Site CPP-91 has been implemented and No Further Action is required.

1.4.22 CPP-93, Simulated Calcine Disposal Trench

1.4.22.1 Description. Site CPP-93 is the Simulated Calcine Disposal Trench and is located just southeast of the Waste Calcining Facility Closure cap. This trench was excavated in the early 1960s and used to dispose of simulated calcine test batches before hot startup of the Waste Calcining Facility. Historical operator log entries and photographs indicate that several tons of simulated calcine material were disposed in the trench which was approximately 61 m (200 ft) long and 2.4 m (8 ft) wide at the bottom sloping to 4.9 m (16 ft) wide at the top with a depth of 1.2 m (8 ft). The simulated nonradioactive calcine material reached a height of 1.1 to 1.2 m (3.5 to 4 ft) before the trench was backfilled to grade with approximately 1.2 m (4 ft) of soil (DOE-ID 1997a).

Ten test batches of solution were calcined and disposed of in the trench. Nine batches used solutions consisting of aluminum nitrate, nitric acid, sodium nitrate, and boric acid. The tenth batch used a solution of aluminum nitrate, nitric acid, sodium nitrate, mercuric nitrate, and boric acid. The tenth test batch was also spiked twice with an aluminum capsule containing a Na-24 tracer to test the efficiency of the off-gas treatment system. The mercuric nitrate was added as an aid in the dissolution of the aluminum capsule. With a half-life of 15 hr, any Na-24 that did not volatilize and was processed into the test batch calcine would have decayed before eventual disposal in the trench (DOE-ID 1997a). Therefore no radionuclides were disposed of in the trench.

In late 1964, construction began on the Calcined Solids Storage Facility II, which is located just east south east of the Waste Calcining Facility Cap. This facility, commonly known as Bin Set 2, consists of seven bins (stainless steel tanks) each 42.3 ft tall with diameters of 12 ft (INEEL 2003). The bins are oriented vertically inside a concrete vault that has an outside diameter of approximately 52 ft. The foundation of the vault was constructed over basalt which required the excavation of over 46 ft of overburden (Note: overburden depth determined from lithologic logs of nearby monitoring well MW-18). In Figure 1-15, dated February 24, 1965, the bin set foundation is clearly visible and shows the extent of excavation required to expose the top of the first basalt layer. In addition, the left central portion of the figure shows a long narrow feature which is thought to be the southern portion of the trench the simulated calcine material was deposited in. Using the vault foundation as a scale, the excavation to the south (left) exceeded 52 ft and is estimated to have consumed approximately 50 ft of the original trench. The area where the upper northwestern part of the trench once existed is currently beneath the soil berm that surrounds Bin Set 2 (see Figure 1-7).

Figure 1-15. Photograph of Bin Set 2 during construction showing vault foundation and southern portion of the CPP-93 Trench (view looking west).

1.4.22.2 Characterization History. During the investigation, a total of 65 borings were drilled to locate the simulated calcine (DOE-ID 1997a). Because the calcine was easily identified visually, only a few samples were collected for laboratory analysis. The analytical results from borings CPP-93-1 through CPP-93-4 confirm the presence of thin layers of simulated calcine material in the vicinity of a trench located southeast of the Waste Calcining Facility cap. The presence of simulated calcine material is supported by visual observations in the borings and elevated concentrations of mercury, aluminum, nitrate/nitrite, and sodium. The observed calcine was only 3 to 5 cm (1 to 2 in.) thick at depths between 1 and 1.5 m (3.5 and 5 ft) bgs.

Samples of the simulated calcine contained elevated concentrations of mercury, aluminum, nitrate/nitrite, and sodium. Concentrations of sodium, nitrate/nitrite, and aluminum appear to decrease with depth in the borings to background levels but mercury concentrations are still above background at the deepest samples in the borings. The full extent of mercury above background has not been defined but the analytical data suggest that mercury concentrations would continue to decrease with depth below 3.0 m (10 ft). The results of additional borings drilled outside of the area of the trench indicate that no lateral migration of mercury and aluminum from the buried calcine has occurred.

1.4.22.3 Remedial Action Decision. This site is sufficiently characterized to approximate the extent of the contamination. Sampling and analysis identified mercury, aluminum, nitrate/nitrite, and sodium as contaminants. Appendix A shows soil contaminant summary sampling results statistics for CPP-93. Remediation goals are exceeded at Site CPP-93 for mercury. The proposed action is to excavate the site and backfill to grade using clean soil.

1.4.23 CPP-124, Leaks from Transfer Line

1.4.23.1 Description. Site CPP-124 is identified as Line 1 ½-inch PLA-2069C Leak west of CPP-750 (Figure 1-16). On December 4, 1987, three small leaks in this underground stainless steel transfer line were observed after it was exposed from an excavation that was part of a service waste upgrade project. How long the transfer pipe was exposed before the leaks were observed is unknown. The distance between the leaks and relative size are also unknown, however, it is known that they occurred along an approximate 3 m (10 ft) length immediately following the 90 degree turn just to the west of CPP-750. When the leaks were observed, the transfer was terminated and the pump tagged out. This line transferred process condensate from CPP-604/605 to the service waste system at or near CPP-709 (Service Waste Monitoring Station). This structure was demolished in September 1999. The amount of liquid released at this site is unknown. During the month of November 1987, 484,533 L (128,000 gal.) were transferred through the line and in the following month of December, 321,760 L (85,000 gal.) were transferred. The potential for large quantities to have been released exists; however, if the leaks were caused by the excavation, the actual release may be relatively small. The extent of this site is unknown and no remediation of the site was reported to have occurred (NSI 2005).

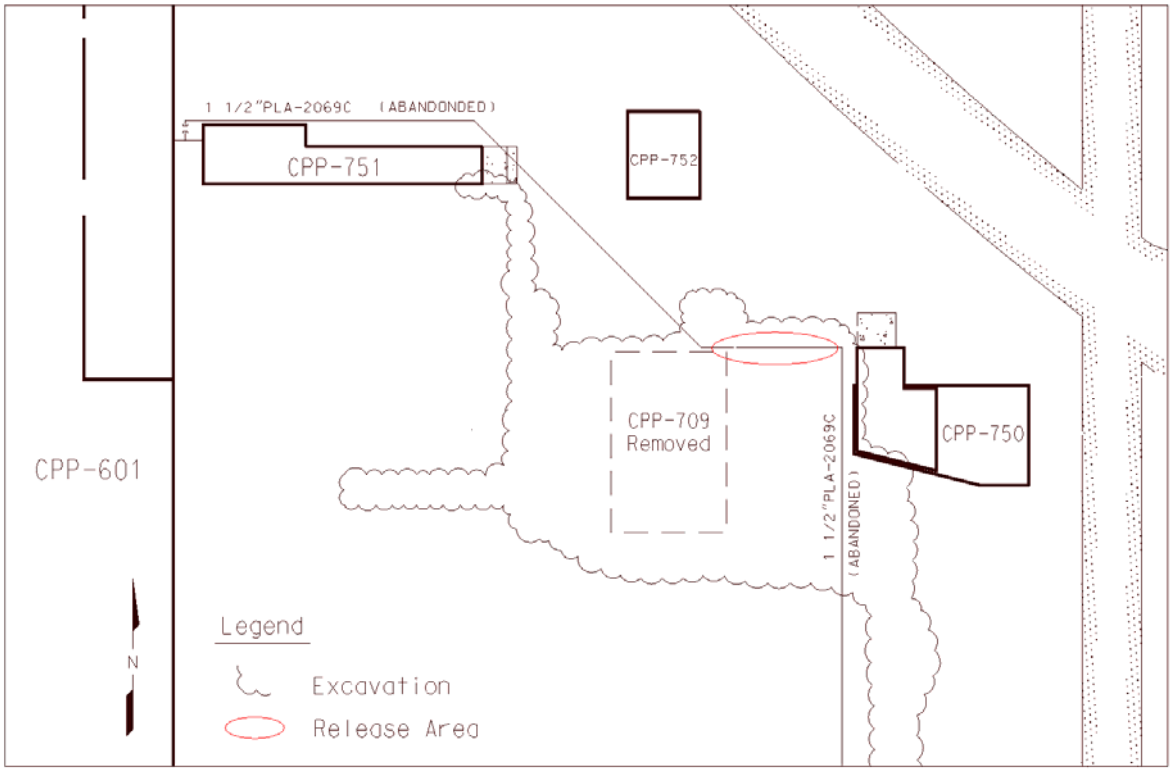


Figure 1-16. Location of release areas at CPP-124 and perimeter of excavated area performed in December 1987.

1.4.23.2 Characterization History. At the time of the discovery, two sample jars were filled with soil from the site to determine a pH, the results of which are not known. The only indication of the types of contaminates present is from sample results from process condensate (similar to the condensate waste

that was released) taken well after the discovery in November and December of 1988. A select summary of analytical results are presented in Table 1-3.

Table 1-3. Select summary of analytical results from process condensate associated with site CPP-124.

Analyte	Result
Sulfate	<0.11201 mg/l
Ag	0.0010 mg/l
Phosphate	0.38741 mg/l
Organic-C	39.48 mg/l
Nitrate (as N)	28.3 mg/l
Hg	0.028 mg/l
Fluoride	0.6317 mg/l
Cyanide	<10 ppb
Chromium	0.0022 mg/l
Chloride	1.3236 mg/l
Total U	1.1E-9 uCi/ml
Total Pu	5.9E-8 uCi/ml
I-129	4.8E-7 uCi/ml
Total Sr	1.49E-6 uCi/ml
Gross Alpha	<3E-8 uCi/ml
Gross Beta	7.4E-6 uCi/ml

Complete analytical results are contained in Reference New Site Identification CPP-124. This transfer line, PLA-2069 is the same number line responsible for the releases identified as CPP-58E. This site, located south of CPP-649 and CPP-604/605, was sampled as part of a 1992 Track 2 investigation. Sampling and analysis showed gross alpha activity ranged from 3.92 ± 0.67 to 24.4 ± 3.28 pCi/g. Subsequent isotopic analyses for alpha-emitting radionuclides on a sample collected from 8 to 10 ft bgs detected U-234 and -238 below background concentrations and Pu-238, U-235, Pu-239, and Am-241 above background. Additional sampling and analysis results indicated that Cs-137 and Sr-90 were above background levels. The gross beta activity ranged from 31.3 ± 2.78 to 271 ± 22.1 pCi/g. Subsequent isotopic analysis for Sr-90 detected concentrations ranging from 0.877 ± 0.276 to 33.4 ± 3.17 pCi/g. The results of the gamma analysis detected only Cs-137 and K-40. The concentrations of K-40 are within normal background ranges. Cs-137 activities ranged from 0.269 ± 0.0211 to 63.1 ± 4.57 pCi/g (DOE 2005b).

1.4.23.3 Remedial Action Decision. Analysis results of the process condensate in 1988 and the analysis of soil samples taken from nearby Site CPP-58E provide some indication of the COPCs that may be present at Site CPP-124. However, specific COCs, concentration levels, and spherical extent of the release are unknown. Characterization of the site will be required to determine the existence of any threat to human health or environment.

1.4.24 CPP-129 Soils Under the CPP-637 and CPP-620 Facilities

1.4.24.1 Description. This site consists of soil located beneath the former CPP-637 Process Improvement Facility and the CPP-620 Chemical Engineering Laboratory/Annex. The Process Improvement Facility (CPP-637) contained offices and seven small-scale general chemistry laboratories and includes the Low Bay Laboratory and the High/Low Bay Laboratory. The Low Bay Laboratory and High/Low Bay Laboratory were located to the south and adjacent to CPP-637. These experimental facilities were used to test and evaluate equipment, processes, and process modifications and improvements, including the Cold Feed Makeup and Dissolution Facility and the 30-cm Calciner Pilot Plant System. The Chemical Engineering Laboratory/Annex (CPP-620) was used for testing and evaluating processes similar to those tested in CPP-637. Waste lines from the individual CPP-637 laboratories ran across the concrete laboratory floor and discharged into 4-inch PLA-2000 that was contained within the utility trench that runs between the laboratories. These concrete surfaces were not designed to provide secondary containment meeting the requirements of the Hazardous Waste Management Act (HWMA)/Resource Conservation and Recovery Act (RCRA). In addition, the 3-inch PLA-106776 waste line and the module and fume hood drains located in the CPP-620 High/Low Bay were direct-buried beneath the concrete floor of the building with no secondary containment.

1.4.24.2 Characterization History. Both buildings were decommissioned and deactiviated in December 2004 in conjunction with the HWMA/RCRA closure. The closure was conducted according to the HWMA/RCRA Closure Plan for the Process Improvement Facility (CPP-637)/Chemical Engineering Laboratory/Annex (CPP-620) Laboratory Piping System and Voluntary Consent Order Site-Tank-005 Tank Systems INTEC-087 and INTEC-091. As part of the closure actions, the overlying concrete slabs and the utility trench were removed and soil samples were collected from beneath the CPP-637 laboratory, utility trench, and the area immediately south of the utility trench. The direct-buried piping was excavated and samples were collected from beneath the piping under the CPP-620 High/Low Bay and the 3-inch PLA-106776 line. During closure activities, small releases from the piping occurred at two locations. In addition, following removal of wetted soil, samples were collected from the locations of the two releases. Sample locations are illustrated in Figure A-7 in Appendix A. Samples were analyzed for constituents of concern, which included metals, volatile organic compounds, and semivolatile organic compounds. Additional samples were collected and analyzed for Cs-137 in accordance with Notice of Soil Disturbance. All Cs-137 concentrations were found to be well below the 23-pCi/g remediation goal. Analytical data are avalable in Appendix A.

1.4.24.3 Remedial Action Decision. At the CPP-620 High/Low Bay, all maximum soil concentrations were screened on the initial screen against background or 1E-06 or Hazard Quotient = 0.1 risk-based concentrations for both human and ecological receptors except for arsenic, cadmium, benzo(a)anthracene, benzo(b)pyrene, and dibenzo(a,h)anthracene for human health. Arsenic is considered to be present at background as this site and was eliminated. The maximum concentrations of cadmium, benz(a)anthracene, and dibenzo(a,h)anthracene were eliminated at the next screening using the 1E-05 risk-based concentration for human health. The maximum concentration of benzo(a)pyrene (0.84 mg/kg) is above the 1E-05 preliminary remediation goal for residential exposure (0.62 mg/kg) but below the 1E-05 preliminary remediation goal for the industrial worker (2.1 mg/kg). As stated in HWMA/RCRA Closure Risk Assessment (ICP 2006b /EXT-06-01143) INTEC is an industrial nuclear facility and there is low probability that this site will have residential use in the future. Soils at the INL are generally remediated to total concentrations contributing less than 1E-04 total risk and/or a HI of 1.0 to the future residential human health scenario (100 years), and a HI of 10 for ecological receptors. The concentrations for benzo(a)pyrene are within acceptable levels for human health.

Neither lead nor cadmium was eliminated in the initial screen for ecological receptor. These contaminants were further assessed using the methods presented in the OU 10-04 Comprehensive RI/FS.

All calculated HIs were below 10 and therefore it is unlikely that these concentrations of cadmium or lead concentrations will pose risk to ecological receptors at a population level. Remedial action is not required for this site. Site CPP-129 in a No Action site.

1.4.25 Summary of Remedial Action Decisions

Thirteen sites will be remediated as described in this Work Plan. The remediated soil must meet the ICDF waste acceptance criteria prior to disposal. Existing characterization data, site process knowledge and any new post ROD information has been evaluated and a recommended site action scenario has been discussed.

Eleven sites will not require remediation based on a thorough review of existing data, additional specific site risk evaluations and a review of post ROD information (if available). Institutional Controls may or may not apply to these sites as discussed in Section 8.

- CPP-14 – Old sewage treatment plant west of CPP-664
- CPP-37B – Gravel Pit 2 and debris landfill inside INTEC fence
- CPP-37C – New site contamination area (construction debris) southeast of CPP-37B.l
- CPP-41A – Fire training pits between CPP-666 and CPP-633, under asphalt
- CPP-44 – Grease pit south of CPP-608
- CPP-48 – French drain south of CPP-633
- CPP-55 – Mercury contamination area south of CPP T-15
- CPP-60 - Paint shop (storage building) at present location of CPP-645
- CPP-68 – Abandoned gasoline tank CPP-VES-UTI-652
- CPP-91 – CPP-633 blower pit drain
- CPP-129 – Soils under the CPP-637 and CPP-620 Facilities.

Thirteen sites will be remediated as described in this Work Plan and the contaminated soil disposed of in the ICDF. Sites CPP-04/05 are combined throughout the text as is CPP-08/09 due to location and soil contamination similarities.

- CPP-01 – Concrete settling basins and dry wells east of CPP-603
- CPP-04/05 – Contaminated soil area around CPP-603 settling tanks and settling basin
- CPP-08/09 – Basin filter system line failure and soil contamination at northeast corner of CPP-603 south basin
- CPP-10 – CPP-603 plastic line leak
- CPP-11 – CPP-603 sludge and water release
- CPP-13 – Pressurization of solid storage cyclone release northeast of CPP-633
- CPP-19 – CPP-603 to CPP-604 line leak.

- CPP-35 – CPP-633 decontamination spill
- CPP-36 – Transfer line leak from CPP-633
- CPP-81 – Abandoned CPP-637/CPP-601 vessel off-gas line
- CPP-93 – Simulated calcine disposal trench.

One site will require an initial site assessment or pre-remediation sampling and analysis to identify contaminants of potential concern. If contaminants or concern are identified with concentrations above the OU 3-13 soil remediation goals or if a risk evaluation identifies significant risk to human health or environment, the site will be remediated per this Work Plan.

- CPP-124 – Leak east of CPP-601.

Table 1-4 contains a summary of the decision process followed to determine a plan of action for each Group 3, Phase II soil contamination site.

Table 1-4. Summary of status for OU 3-13, Group 3, Phase II soil contamination sites.

Group 3 Phase II Site	Adequate Information for Decision?	COCs Greater than Remediation Goals[a]	Ecological Risk?	Remediation Required?	Is the General Extent of Contamination Known?	Characterization or Additional Characterization Required?	Planned Action
CPP-01	Yes	^{137}Cs, ^{90}Sr	Yes	Yes	Yes	No	Excavate/backfill
CPP-04/05	Yes	^{137}Cs, ^{90}Sr, ^{152}Eu, ^{154}Eu	Yes	Yes	Yes	No	Excavate/backfill
CPP-08/09	Yes	^{137}Cs	Yes	Yes	Yes	No	Excavate/backfill, Institutional Controls
CPP-10	Yes	^{137}Cs, ^{90}Sr[b]	Yes	Yes	Yes	No	Excavate/backfill, Institutional Controls
CPP-11	Yes	^{137}Cs, ^{90}Sr[a]	Yes	Yes	Yes	No	Excavate/backfill, Institutional Controls
CPP-13	Yes	^{137}Cs, ^{90}Sr	Yes	Yes	Yes	No	Excavate/backfill
CPP-14	Yes	None	No	No	Yes	No	Institutional Controls
CPP-19	Yes	^{137}Cs, ^{90}Sr, ^{152}Eu, ^{154}Eu	Yes	Yes	Yes	No	Excavate/backfill, Institutional Controls
CPP-35	Yes	^{137}Cs, ^{90}Sr	Yes	Yes	Yes	No	Excavate/backfill, Institutional Controls
CPP-36	Yes	^{137}Cs, ^{90}Sr	Yes	Yes	Yes	No	Excavate/backfill, Institutional Controls
CPP-37B	Yes	None	No	No	Yes	No	No Action
CPP-37C	Yes	None	No	No	Yes	No	No Action
CPP-41A	Yes	None	No	No	NA	No	No Action
CPP-44	Yes	None	No	No	NA	No	Institutional Controls
CPP-48	Yes	None	No	No	NA	No	Institutional Controls
CPP-55	Yes	None	No	No	Yes	No	No Action
CPP-60[b]	Yes	None	No	No	No	No	No Action
CPP-68	Yes	None	No	No	Yes	No	No Action
CPP-81	Yes	None	Yes	Yes	Yes	No	Excavate/backfill
CPP-91	Yes	NA	NA	No	NA	No	Institutional Controls
CPP-93	Yes	Mercury	Yes	Yes	Yes	No	Excavate/backfill
CPP-124	No	TBD	TBD	TBD	No	Yes	Characterize
CPP-129	Yes	No	No	No	Yes	No	No Action

a. At depths from 0 to 10 ft bgs.
b. See Section 1.4.17.3
TBD = To be determined.

2. DESIGN BASIS

This section contains the basis and the objectives governing the remedial design for the OU 3-13, Group 3, Other Surface Soils sites. These objectives include those defined by the OU 3-13 ROD, the major components required in the remedy to meet the ROD objectives, and the bounding INL objectives. The principal threat posed by the Group 3 sites is external exposure to contaminated soils. The selected remedy for the Group 3 sites will eliminate this threat by removing the contaminated soils.

Although the remedial design for Group 3, Phase II soils is based upon the requirement, as stated in the OU 3-13 ROD, to excavated contaminated soils containing constituents that exceed remediation goals down to a depth of 10 ft. This depth is stated extensively in Section 3 as part of the development of the data quality objectives. At this depth, contaminated soils should not contribute to future residential exposure and does not cause an adverse impact to the Snake River Plain Aquifer (DOE-ID 2005a). However, the project will retain the flexibility to excavate beyond the 10 depth requirement if, by doing so, would allow a site to be classified as a no action site (free release) verses *a no further action site (requiring institutional controls).*

2.1 Remedial Action Objectives

The following are the remedial action objectives for the Group 3 soils, as developed in the OU 3-13 ROD, Section 8 (2a) (DOE-ID 1999a):

> "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 HI of 1 is not exceeded at each release site. These remedial action objectives also address No Further Action sites where the current radiological contaminant levels will meet residential risk-based concentration on or before the year 2095. The remedial action objectives will be achieved as follows:

- DOE Operational Phase, expected until year 2045:
  - Implement institutional controls to limit access and exposure duration at each source area to achieve a cumulative carcinogenic risk of 1×10^{-4} and a total HI of 1.
  - Remove contaminated soil at each source area, sufficient to achieve a cumulative carcinogenic risk of 1×10^{-4} and a total HI of 1 to a future residential user; or cap in place contaminated soil or debris areas presenting a cumulative carcinogenic risk of 1×10^{-4} and a total HI of 1.
- Government Control Phase, expected between year 2045 and 2095:
  - Implement institutional controls to limit the duration and frequency of exposure to non-capped contaminated soil areas by the public to achieve a cumulative carcinogenic risk of 1×10^{-4} and a total HI of 1.
  - Maintain caps for contaminated soil areas, which are contained in place, to prevent exposure of the public to a cumulative carcinogenic risk of 1×10^{-4} and a total HI of 1.
  - Maintain the closed and capped ICDF complex to prevent exposure of the public to a cumulative carcinogenic risk of 1×10^{-4} and a total HI of 1.

- Post-government control, beyond 2095:

  – Continue institutional controls at all capped areas to prevent disturbance of capped areas to achieve a cumulative carcinogenic risk of 1×10^{-4} and a total HI of 1."

To meet these remedial action objectives, remediation goals were established in the OU 3-13 ROD (DOE-ID 1999a) to ensure a risk-based protectiveness of human health and the environment. These contaminant-specific goals, summarized in Table 2-1, are quantitative cleanup levels based primarily on applicable or relevant and appropriate requirements and risk-based doses.

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

Contaminant of Concern	Soil Risk-Based Remediation Goal or Single Contaminant of Concern (pCi/g or mg/kg)
Radionuclides	
Am-241	290
Cs-137	23
Eu-152	270
Eu-154	5200
Pu-238	670
Pu-239/240	250
Pu-241	56,000
Sr-90	223
Nonradionuclides	
Mercury (human health)	23

Section 8.1.3 of the OU 3-13 ROD states the following:

> "The primary threat posed by the Group 3, Other Surface Soils is external exposure to contaminated soils (DOE-ID 1999a). The remediation goal for the Other Surface Soils sites is to prevent external exposure to current workers and nonworkers and future workers and residents. This remediation goal will be accomplished by:

- Implementing the institutional controls described in Table 11-1 [of the OU 3-13 ROD]
- Minimizing future residential exposure to surface soils in 2095 and beyond by excavating the contaminated soils exceeding the remediation goals in Table [2-1], to a minimum depth of 3 m (10 ft) and subsequent disposal and management of the excavated soils in the ICDF
- Capping the contaminated areas that are not excavated with an engineered barrier in accordance with the substantive requirements of the hazardous waste landfill closure standards (IDAPA 16.01.05.008; 40 CFR 264.310)."

In addition to the threat posed by the Group 3 soils of external exposure, the OU 3-13 ROD also discussed the possible threat to underlying groundwater. Since finalization of the ROD, the OU 3-14 RI/BRA, through extensive modeling of the alluvium and groundwater, has concluded that Group 3 soils do not pose a risk to groundwater.

Table 11-1 in the OU 3-13 ROD stipulates that Institutional Controls will apply to Group 3, Other Surface Soil sites following soil remediation when contamination is left in place at depths greater than 10 feet bgs.

2.2 Applicable or Relevant and Appropriate Requirements

The OU 3-13 ROD separated the applicable or relevant and appropriate requirements for the selected remedy for the Group 3 Other Surface Soils into action-specific, chemical-specific, and to be considered requirements. Table 2-2 identifies the substantive requirements of the applicable or relevant and appropriate requirements and the to-be-considered requirements and presents the strategies to be employed to comply with these requirements.

Table 2-2. Group 3, Other Surface Soils, applicable or relevant and appropriate requirements and compliance strategy.

Alternative/applicable or relevant and appropriate requirements Citation	Description	Relevancy	Compliance Strategy
Action-specific			
IDAPA 58.01.01.650, 58.01.01.651 "Fugitive Dust"	Requirements for dust control during remediation	A	Dust suppression measures will be applied, where required, during implementation of the remedial action to minimize the generation of fugitive dust. These measures may include water sprays, commercial dust suppressants, minimizing vehicle speeds, covering soil piles with tarps and securing the tarps, and work controls during high winds.
IDAPA 58.01.01.585, 58.01.01.586 "Toxic Air Emissions"	Rules for the control of air pollution in Idaho	A	Releases of carcinogenic and noncarcinogenic contaminants into the air from the site remediation activities will be modeled. Based on the modeling, the remediation activities will be in compliance in with the applicable requirements.
40 CFR 61.92, 61.93 "Emission Monitoring"	National Emissions Standards for Hazardous Air Pollutants for Radionuclides from DOE Facilities, Emission Monitoring, and Emission Compliance	A	Radionuclide emissions generated from the remediation activities will be modeled. Based on the modeling, the remediation activities will be in compliance in with the applicable National Emissions Standards for Hazardous Air Pollutants requirements. Measures will be implemented to minimize the generation of radionuclide emissions. Measures used to reduce emissions from contaminated soils may include use of water spray, keeping vehicle speeds to a minimum, covering soil piles with tarps or lockdown materials, and work controls during high winds.

Table 2-2. (continued).

Alternative/applicable or relevant and appropriate requirements Citation	Description	Relevancy	Compliance Strategy
IDAPA 58.01.05.006 (40 CFR 262.11) "Hazardous Waste Determination"	Hazardous waste determination for wastes	A	Hazardous waste determinations will be performed on all waste streams generated during remediation as specified in the Waste Management Plan (DOE-ID 2006b). (Note: This applicable or relevant and appropriate requirement applies to waste generated outside of the WAG 3 area of contamination.)
IDAPA 58.01.05.008 (40 CFR 264.553)	Temporary units	A	The siting of a temporary unit to manage remediation wastes is not planned due to the availability of the Staging and Storage Annex and ICDF for management of potential waste streams requiring storage.
IDAPA 58.01.05.008 (40 CFR 264.554) "Staging Piles"	Establishes the standards for remediation waste staging piles for remediation wastes	A	The use of staging piles at the excavation sites is not anticipated. If due to management needs, a waste staging pile is necessary for nonflowing remediation waste, it will be established in proximity to the remediation site. The project will provide facility operations with staging pile guidelines and an inspection checklist.
IDAPA 58.01.05.011 (40 CFR 268.40) "Land Disposal Restriction Treatment Standards"	Establishes the land disposal restriction (LDR) treatment standards	A	As applicable, land disposal restrictions will be met for CERCLA remediation wastes that would otherwise be managed as a RCRA hazardous waste and have triggered placement, are sent to an off-Site facility for disposal, or require LDR compliance prior to disposal as specified in the OU 3-13 ROD. Short-term management (less than 2 years) of remediation wastes in staging piles will not trigger placement. None of the Group 3 Phase II sites require LDR compliance by ROD citation prior to disposal.
IDAPA 58.01.05.011 (40 CFR 268.49) "Alternative Treatment Standards for Contaminated Soils"	Establishes the alternative LDR treatment standards for contaminated soil	A	The alternative treatment standards for contaminated soils will be met for the CERCLA remediation soils that would otherwise be managed as a RCRA hazardous waste and have triggered placement, are sent to an off-Site facility for disposal, or require LDR compliance prior to disposal, as specified in the OU 3-13 ROD (DOE-ID 1999a). None of the Group 3 Phase II sites require alternative LDR compliance by ROD citation prior to disposal.

Table 2-2. (continued).

Alternative/applicable or relevant and appropriate requirements Citation	Description	Relevancy	Compliance Strategy
Chemical-specific			
IDAPA 58.01.05.005 (40 CFR 261.20 through 24) "Characteristics of Hazardous Waste"	Hazardous waste characteristics identification	A	The applicable waste streams will be characterized in accordance with the Field Sampling Plan, RD/RA Waste Management Plan, and the Characterization Plan.
40 CFR 761.50(a)(5)	PCB disposal requirements	A	These requirements apply to PCB-contaminated soils and debris and will be met by disposing of Group 3 wastes to the ICDF, which is designed to meet these requirements. There has been no Phase II remediation wastes identified that would trigger the various PCB requirements. However, if wastes with PCB contamination are discovered that would trigger management as PCB-regulated wastes, they will be managed per the identified requirements.
40 CFR 761.50(b)(3)	Provides cleanup and disposal options for PCB remediation waste	A	Applies to PCB-contaminated soils and debris. Excavation, management, and disposal of PCB–contaminated wastes will be based on the concentration at which the PCBs are found. Where PCB waste is expected, waste stream sampling and analysis will be performed to document that levels of PCBs in the waste meet the ICDF waste acceptance criteria.
40 CFR 761.50(b)(7)	PCB radioactive waste Establishes the management and disposal requirements for PCB/radioactive waste	A	Applies to PCB-contaminated soils and debris. PCB/radioactive waste containing ≥50 ppm PCBs must be managed and disposed taking into account both its PCB concentration and its radioactive properties. Where PCB waste is expected, waste stream sampling and analysis will be performed to complete the waste profile and will document that levels of PCBs in the waste meet the ICDF waste acceptance criteria. The ICDF waste acceptance criteria accounts for both the PCB and radionuclide content. There has been no Phase II remediation wastes identified that would trigger the various PCB requirements. However, if wastes with PCB contamination are discovered that would trigger management as PCB-regulated wastes, they will be managed per the identified requirements.

Table 2-2. (continued).

Alternative/applicable or relevant and appropriate requirements Citation	Description	Relevancy	Compliance Strategy
40 CFR 761.50(b)(8)	Porous surfaces Requires that PCB-contaminated materials with porous surfaces be disposed as PCB waste	A	Applies to PCB-contaminated debris. All Group 3 PCB-contaminated wastes will be disposed at the ICDF, and will be considered PCB remediation waste. Disposing of Group 3 wastes at the ICDF meets this because the ICDF meets the requirements of 40 CFR 761.75.
40 CFR 761.50(d)(4) *Chemical waste landfills*	Disposal requirements for PCBs Sets the design requirements for chemical waste landfills.	A	Applies to PCB-contaminated soils and debris. Disposing of Group 3 wastes at the ICDF meets this requirement because the ICDF meets the design requirements of 40 CFR 761.75.
To Be Considered			
DOE Order 435.1 "Radioactive Waste Management"	Radioactive waste management performance objectives to protect workers	TBC	Dose to workers will be reduced through the use of monitoring, administrative, and engineering controls. Job safety analyses and/or radiological work permits will be prepared for tasks where there is the potential for exposures to radioactive contamination/materials. Radiological work permits will be developed by radiological control personnel based on actual hazards and in accordance with applicable company manuals.
DOE Order 5400.5, Chapter II (1) (a,b)	Establishes radiation protection standards and controls to limit the effective dose to the public.	TBC	Specific radiation dose limits to the public will be met through monitoring, administrative, and engineering controls as required during excavation and construction in contaminated areas.

A = Applicable
TBC = To be considered.

Note: When the OU 3-13 ROD was signed, the IDAPA requirements in place at that time were IDAPA 16. These have since been replaced by IDAPA 58. The requirements in place at time of signing of the ROD will be used.

2.3 Uncertainty Management

Unforeseen events may arise throughout the course of the remediation activities for the Group 3, Other Surface Soils sites. An objective of the RD/RA is to minimize unforeseen events by analyzing the potential uncertainties and develop an approach to manage each uncertainty. The uncertainties identified and the strategies for managing them are outlined below.

- Change from residential to industrial use area:
    - The OU 3-13 ROD designated the property within the INTEC perimeter as future residential land use. During the finalization of the OU 3-14 feasibility study (in early 2006) proposed a change from residential land use to industrial land use for and area containing and

surrounding the tank farm, which in excess of 40,000 m^2. If accepted, this proposed change will be documented in the OU 3-14 ROD, which is scheduled for completion in December 2006. A change from residential to industrial would have an impact on the remedial action approach to OU 3-13 contaminated soil sites located within the area. The main impacts that could happen include a reduction in excavation depth requirements (from 10 ft to 4 ft) and changes to applicable or relevant and appropriate requirements. Sites that could be impacted include CPP-13, -35, -36, -93, and -124.

2.4 Identification of Unresolved Issues

Two issues have been identified that cannot be resolved prior to finalization of this Work Plan and its supporting documents. Resolution of these issues is required to complete the remedial action described herein.

2.4.1 Potential Conflict Associated with the Schedule for Remediation of CPP-36

Currently, the Remote Handled Transuranic and Tank Farm Closure projects require unrestricted access to Olive Avenue. Due to the need to block access to Olive Avenue for an extended period of time during the removal of CPP-36 soils, coordination activities with the Remote Handled Transuranic and Tank Farm Closure programs have been initiated to eliminate any impact to the Group 3 remediation schedule. However, if substantial CERCLA costs are required to alleviate the impact, then it will be brought to the Agencies attention and the RD/RA work plan may be revised.

2.4.2 Potential Conflict Associated with the Schedule for Remediation of Sites Around CPP-603

Currently portions of the site boundaries for CPP-08/09 are identified as being underneath building CPP-603. Remediation of these sites is not expected to occur until the DD&D or capping of CPP-603. Coordination activities with the Spent Nuclear Fuel program have been initiated to eliminate any impact to the Group 3 remediation schedule. However, if substantial CERCLA costs are required to alleviate the impact, then it will be brought to the Agencies attention and the RD/RA work plan may be revised.

3. REMEDIAL DESIGN

This section describes the remedial design for the Group 3, Phase II remediation sites. This design was developed in accordance with the engineering design basis presented in Section 2. This section also includes design assumptions, design approach, a description of the real-time characterization and sampling activities required to identify additional data necessary to make decisions regarding the remedial actions for the Group 3, Other Surface Soil sites. Additionally, the remedial action objective implementation strategy, design approach, and the strategy for handling unexpected waste are described herein. The excavation figures for the soil remediation activities are included in Appendix B.

3.1 Design Assumptions

This section describes the design assumptions under which the RD/RA Work Plan design was developed for the Group 3 Other Surface Soils, Remediation Sets 4-6, Phase II sites. Several assumptions have been made relative to the design of the remedy. The design will proceed based on these assumptions until additional information or sampling data are made available to better define the assumptions.

- Soil with contaminant levels exceeding the OU 3-13 remediation goals will be excavated to a depth of 3 m (10 ft) to prevent future residential exposure.

- Contaminated soils at a depth in excess of 3 m (10 ft) will not be removed since it is at a depth that should not contribute to future residential exposure and does not cause an adverse impact to the Snake River Plain Aquifer (DOE-ID 2005a).

- Contaminated waste generated from the Group 3 soils remediation must meet the ICDF waste acceptance criteria prior to disposal.

- Remote operations are not required. The design approach will use standard excavation equipment and techniques to remove the soils and debris.

- There are no wastes containing PCBs > 50 ppm.

- Real-time spectroscopy and soil analysis methods (including, but not limited to, Jerome and Lumex Hg Analyzer, HNu, Backpack Spectroscopy System, and High Purity Germanium) are available to provide data to support field operations in determining that remediation has achieved the radionuclide remedial action objectives. Cs-137 will be used as an indicator of soil contamination, except at site CPP-93 where mercury is the only COC.

- Excavation limitations due to high radionuclide contamination and subsurface infrastructure may require the use of enclosures.

- Abandoned-in-place RCRA lines have not been RCRA-closed and are uncovered during excavations will be managed under applicable RCRA requirements. Line removal will be documented to support RCRA closure of the system. Lines identified as having been previously closed under RCRA will be cut and capped, as necessary, and generated waste will be managed as CERCLA waste.

3.2 Design Criteria

This section documents the engineering requirements and excavation depths used to develop the excavation design. This information, along with the latest engineering standards, will be used to develop

design documents and construction specifications that will be used in the field. The excavation figures are included in Appendix B of this plan.

3.2.1 Engineering Design Requirements

Engineering design requirements for excavation of contaminated soil include:

- Soils shall be excavated if contamination levels exceed the remedial action objectives to a maximum depth of 10 ft bgs.
- Excavations resulting from the remediation activity will be replaced with backfill or if uncontaminated overburden exists at a Group 3 site, it may be stock piled, surveyed for contamination and if clean (i.e., below remediation goals) may be reused.
- Sites will be backfilled and graded for erosion control.
- Abandoned underground utilities and structures shall be cut, capped, and removed.
- Abandoned HWMA/RCRA lines will be cut, capped, and removed as necessary to complete remediation. The removed line will be managed per any applicable HWMA/RCRA requirements that apply to the line.
- Active underground utilities and structures shall be maintained through excavation activities.
- Permanent above ground structures shall be maintained through excavation activities.
- Overhead utilities and structures shall be maintained through excavation activities.
- Fencing, roadways and ditches shall be maintained through excavation activities.

3.2.2 Remedial Action Objective Implementation Strategy

The following strategy was developed to implement the remedial action objectives for the Group 3, Other Surface Soils remediation as specified in the OU 3-13 ROD and summarized in Section 2.1 of this Work Plan.

3.2.2.1 Design Excavation Depths

The design excavation depths shown in the excavation figures (Appendix B) were based on the compilation and review of existing data for each site. The depth to which a site is to be excavated was determined by selecting the depth at each site where detected soil COCs were below the remediation goals. Where data were available at multiple depths for a given site, the excavation depth was determined by selecting the first sampled depth where COCs were below the remediation goals or to a maximum depth of 10 ft bgs. Table 3-1 presents the design excavation depth and its basis for each remediation site.

Table 3-1. Design excavation depths.

Site	Design Excavation Depth (ft)	Comments
CPP-01	10 ft	Effluent from supernatant drained to dry well (CPP-303) percolated into surrounding soil
CPP-04/05	5 ft	Soil above settling basin (CPP-740) and pit (CPP-301)
CPP-08/09	10 ft	Leak from recirculation line in CPP-603 basin
CPP-10	10 ft	Release from CPP-603 basin onto building floor and drained through access door contaminating adjacent soil
CPP-11	10 ft	Surface spill (directly above VES-SFE-106 tank) from CPP-603 fuel storage basin sludge and liquids
CPP-13	2–8 ft	Airborne contamination on the berm area from pressurization of the solid storage cyclone
CPP-19	10 ft	Leak in a waste transfer line north of CPP-603
CPP-35	10 ft	Release of decontamination solution through the air transport system during decontamination of calcine vessel WC-102
CPP-36	10 ft	Multiple releases from CPP-633 transfer line to WL-102
CPP-81	3-ft	Contaminants contained completely within the abandoned vessel off-gas line.
CPP-93	8 ft	Simulated calcine disposal trench

3.2.2.2 Contamination Below Design Depth. Based on an evaluation of existing Group 3 sites soil characterization data, many Group 3 soil sites have contamination at depths below 10 feet. The excavation of soil contamination below 10 feet bgs has been addressed in the OU 3-13 ROD and the Remedial Design/Remedial Action Scope of Work for Waste Area Group 3, Operable Unit 3-13 (DOE-ID-2000a). The ROD declaration for removal of contaminated soil at Group 3 sites states the following:

> "Major components of the selected remedy include:
>
> - Remove contaminated soil and debris from Group 3 sites using the following conventional excavation methods:
>
> - Remove contaminated soils and debris above the 1×10^{-4} risk level based on an assumed future residential use in the year 2095 and beyond and replace with clean soil, so that from the surface to a depth of 3 m (10 ft) the land can be released for future residential use. Contamination below 3 m (10 ft) may also be excavated at the discretion of the DOE, if determined to be more cost effective than maintaining necessary institutional controls, to prevent future drilling through deep contamination zones and transportation of contaminants to the underlying aquifer. In addition, excavation activities below the 3 m (10 ft) depth that could cause the movement of contaminants either to the surface or to the underlying aquifer will also be controlled.
>
> - Dispose of contaminated soils and debris in the ICDF.

- Survey and record contamination left in place at depths below 3 m (10 ft) for future institutional controls, as necessary.

- Replace excavated soils with clean backfill and re-grade."

In addition, Section 4.3.8.1, *Institutional Controls Scope* from the OU 3-13 RD/RA Scope of Work states the following:

> "Group 3 is composed of the surface soil site with in the INTEC. The remedy for the Group 3 soils is to excavate the soils to a maximum depth of 3 m (10 ft) and dispose the impacted material within the ICDF."

Group 3 sites with soil contamination at depths less than 10 feet bgs will be excavated until it is demonstrated through real-time confirmation spectroscopy and sampling that remediation goals have been achieved. If soil contamination above the remediation goals is encountered following initial excavation to design depths less that 10 feet bgs, excavation will continue until remediation goals have been met or to a maximum of 10 feet bgs. For radionuclide-contaminated soil, real-time spectroscopy will be performed on the soil at 10 feet bgs and confirmation samples will be collected from soil surfaces above 10 feet bgs prior to back filling the excavation (see Phase II Field Sampling Plan).

3.3 OU 3-13, Group 3, Phase II Design Approach

This section describes the design approach for remediation of the Phase II sites, CPP-01, -04/05, -08/09, -10, -11, -13, -19, -81, -93, -35, and -36. Remediation of these sites entails excavation and removal of contaminated soils above remediation goals and/or that pose an environmental risk. Real-time spectroscopy will be used during soil excavation operations to assess the nature and extent of contamination and support confirmation sampling. Direct push probes, gamma logging and sampling will be used primarily on highly contaminated and new sites. Table 3-2 shows the list of excavation plot plans for these Phase II remediation sites. The excavation plot plans are provided in Appendix B.

Table 3-2. Excavation figures list for OU 3-13 Phase II sites.

Sites	Figure	Sketch Description
CPP-01, 04 and 05	B-1	Excavation plan for CPP-01, 04 and 05
CPP-01, 04 and 05	B-2	Sections and excavation profiles for CPP-01, 04 and 05
CPP-08, 09 and 10	B-3	Excavation plan for CPP-08, 09 and 10
CPP-08, 09 and 10	B-4	Sections and excavation profiles for CPP-08, 09 and 10
CPP-11	B-5	Excavation plan, sections and profile for CPP-11
CPP-13	B-6	Excavation plan, sections and profile for CPP-13
CPP-19	B-7	Excavation plan, sections and profile for CPP-19
CPP-35	B-8	Excavation plan, sections and profile for CPP-35
CPP-36	B-9	Excavation plan for CPP-36
CPP-36	B-10	Sections and excavation profile for CPP-36
CPP-81	B-11	Excavation plan for CPP-81
CPP-93	B-12	Excavation plan for CPP-93
CPP-93	B-13	Sections and excavation profile for CPP-93

The estimated excavation and backfill volumes for sites to be remediated were calculated using TERRAMODEL computer software. These estimated volumes do not include adjustments for structures in the excavations or areas where shoring may be required. Actual soil volumes will be documented in the remedial action report.

3.3.1 Soil Characterization and Direct Push Probes

The RD/RA Scope of Work states that, "Preremedial characterization will not be performed [and] the prioritization and work planning process will be based solely on the results of the remedial investigation. However, during excavation, a statistical-based observational approach sampling method will be used to refine and confirm excavation extent."

Real-time spectroscopy methods are the observational approach sampling methods that will be used to assist in determining contamination extent during excavation of Group 3 contaminated soil sites. Existing data obtained during Track 1, Track 2, or RI/FS sampling events will be used to begin excavation with confirmation sampling being the final step to certify the remediation goals have been met at each soil site. Direct push probes will be used in those areas where real-time spectroscopy instrumentation is ineffective (i.e., due to high background radiation) or for those sides with no existing data, such as, for new sites. Where necessary, subsurface grab samples will be obtained using direct push probes. Hand auguring or limited vacuum excavation may also be necessary in those areas with substantial subsurface infrastructure.

3.3.1.1 Real-Time Spectroscopy and Analysis.

Real-time spectroscopy instrumentation with gamma and beta detectors will be used during the excavation of Group 3 Phase II soil sites to minimize costs and provide faster results. The real-time spectroscopy methods used during soil excavation are also known as wide area soil screen.

The real-time spectroscopy methods can report several radionuclides; however, the gamma methods will be calibrated for Cs-137 as the primary radionuclide indicator at the Group 3 Phase II sites. Concentrations are typically reported in pCi/g, with 1-sigma counting uncertainty. Results are reported along with uncertainties and minimum detectable activities.

In situ gamma spectrometry systems are used in two modes; field and sample. Field mode will be used for final confirmation of the Group 3 Sites remediation. Either the High Purity Germanium or Backpack Spectroscopy System will be used in field mode. In field mode, a 40–60% efficient high-purity germanium detector is placed on a tripod, and pointed in a downward direction. The height of the detector above the ground surface determines the field of view the detector "sees." This height can be easily varied such that the detector field of view can range from 10 to 70 ft in diameter. The detectors are laboratory calibrated using NIST traceable point sources, and quality control checks are performed and charted on every detector at least twice weekly. The Backpack Spectroscopy System is carried using a backpack and can detect real-time concentrations of Cs-137. The system can be used to walk across a given area and then the concentrations plotted to a figure to determine areas of highest concentration. The Backpack Spectroscopy System can also be used to determine the contamination at individual points to ensure that an area has been completely remediated.

3.3.1.2 Direct Push Probe Gamma Logging and Sampling. The lateral extent of soil contamination is defined by physical boundaries for several sites and by existing sampling data for others. Therefore, the primary purpose of the direct push probeholes is to define the extent and distribution of radionuclide, organic, and inorganic chemical contamination in the subsurface for release sites that do not lend themselves to real-time screening or for new site characterization Locations for new probeholes will be proposed in the Phase II Field Sampling Plan (Attachment 1) using best judgment based on the locations of known release sites, data gaps in the extent and distribution of contamination at those sites, and surface and subsurface infrastructure that may preclude installing probes at some locations. The subsurface gamma radiation surveys will be used to produce log plots showing variations in gamma-ray flux at depth. Correlation between log plots will be used as a basis to estimate the combined horizontal and vertical extent of soil contamination zones. Additionally, several existing probeholes (CPP-36 area) may be re-logged to establish a correlation between gamma readings obtained using past and current logging instruments.

Cs-137 soil contamination is expected to be the principal source of the mapped radiation fields, as it has been found in all contamination zones discovered in the tank farm to date. It is a universal constituent of processed waste streams in past and present tank farm operations, and it is easily detected at low concentrations (<10 pCi/g). Anomalous gamma radiation areas, most likely associated with Cs-137 contamination, will then serve as an indicator of contamination zones where other analytes of concern are most likely to occur.

Subsurface radiation logging will be conducted using a downhole high-density bismuth germanium oxide gamma-detector logging tool or equivalent. The actual gamma-logging tool and operating procedures will be identified in the technical approach document, based on the requirements. The gamma-ray logging tool will be operated in move-stop-acquire mode to detect and record gross gamma-radiation flux with depth. The suggested depth increment is 6 inches along the probehole length. Gross gamma is recorded at each depth increment at 100 counts per second for 10 seconds (this constitutes a logging time of 3 ft per minute under normal conditions). Systems of this type can achieve a minimum detection level of 3 pCi/g for Cs-137 in soil surrounding the casing.

Hand augering may be required prior to probing or sampling in those Phase II soil areas with significant or unknown subsurface infrastructure.

3.3.1.3 Characterization Sampling Requirements. Characterization sampling to determine the extent of contamination at Phase II soil sites is not expected to be required for the majority of Group 3 soil sites. Real-time spectroscopy techniques will be used during soil excavation at those sites with existing characterization data. Existing characterization data (see Appendix A) will also be used to prepare or update the ICDF material profile for Group 3 soil disposal.

Characterization samples will be required for site CPP-124. This site has no existing characterization data and is being included in this work plan for evaluation and potential remediation. Sampling and analysis requirements for this site are discussed in the Group 3 Phase II Field Sampling Plan. Additional New Sites that will be included in this Work Plan as defined in Section 1.3.3 will also require characterization sampling to determine contamination extent and ICDF disposal acceptance.

3.3.1.4 Confirmation Sampling. When excavation of a Phase II soil site is complete, field calibrated real-time spectroscopy and analysis methods will be used to ensure any remaining soil contamination is below the remediation goals. The real-time spectroscopy methods can report several radionuclides; however, the selected method will be calibrated for Cs-137 as the primary radionuclide indicator at the Group 3 Phase II sites. The confirmation soil sampling strategy is described in detail in the Field Sampling Plan (Attachment 1).

3.3.2 Remediation of Sites CPP-01, -04, and -05

Site CPP-01 includes concrete settling basins and dry wells east of CPP-603. Site CPP-04/05 is the contaminated soil area around CPP-603 settling tank and settling basin.

3.3.2.1 Utilities and Surface Features. Multiple active or abandoned utility lines pass through CPP-01 and -04/05. These lines include a process waste line and a high pressure steam line.

3.3.2.2 Excavation and Removal of Contaminated Soils. The remediation of Site CPP-01 involves the removal of the concrete settling basin in CPP-301 and excavation of contaminated soils to 10 ft bgs. Contaminated soils surrounding the deep dry well CPP-303 and the dry well components will be excavated and removed down to 10 ft bgs. The six-inch stainless steel pipe (approximately 12 ft bgs) used to discharge the supernatant from CPP-301 to the deep dry well CPP-303 will be left in place. Drain line 3-½ inch PLA-100115, located next to CPP-303, is a RCRA line and is considered clean (having been RCRA closed prior to 2000 [INEEL 2000]. The section of this line exposed during excavation of CPP-01 can be managed as CERCLA waste.

The remediation of Site CPP-04/05 involves excavation and removal of the contaminated soils around the CPP-603 settling tank and basin to 5 ft bgs.

The estimated volume of contaminated soil for CPP-01 and -04/05 is 1,375 yd^3.

3.3.2.3 Confirmation Soil Sampling. There are no specific design requirements for CPP-01, -04/05 confirmation sampling. The confirmation sampling strategy is described in detail in the Phase II Field Sampling Plan (Attachment 1).

3.3.2.4 Backfill Operations and Site Restoration. The sites will be backfilled with clean soil. The estimated volume is 1,375 yd^3. Contouring and grading of backfill excavation will be performed to maintain existing surface water drainage patterns or as designated in design drawings.

3.3.3 Remediation of Sites CPP-08/09 and -10

Site CPP-08/09 includes contaminated soils east of building CPP-603 resulting from a leak in the recirculation line in the CPP-603 basin. Portions of CPP-08/09 contaminated soils are expected to be beneath building CPP-603. Site CPP-10 includes contaminated soils and asphalt adjacent to the east side of building CPP-603 resulting from fluid draining onto the floor area and through a personnel access door at building CPP-603.

3.3.3.1 Utilities and Surface Features. Multiple active or abandoned utility lines pass through CPP-08/09 and -10. These lines include fire water lines, process waste lines, high-pressure steam lines, and electrical duct banks. Many of the utilities enter building CPP-603 in the same location as Sites CPP-08/09 and -10.

3.3.3.2 Excavation and Removal of Contaminated Soils. The remediation of Sites CPP-08/09 and -10 involves excavation and removal of contaminated soils outside building CPP-603 to 10 ft bgs. A phased excavation may be implemented if there are structural concerns associated with the foundation of the building. The estimated volume of contaminated soil for CPP-08/09 and -10 is 1,731 yd^3.

3.3.3.3 Confirmation Soil Sampling. There are no specific design requirements for CPP-08/09, -10 confirmation sampling. The confirmation sampling strategy is described in detail in the Phase II Field Sampling Plan (Attachment 1).

3.3.3.4 Backfill Operations and Site Restoration. The sites will be backfilled with clean soil. The estimated volume is 1,731 yd^3. Contouring and grading of backfill excavation will be performed to maintain existing surface water drainage patterns or as designated in design drawings.

3.3.4 Remediation of Sites CPP-11 and -19

Site CPP-11 is contaminated soil directly above the Basin Liquid Waste Tank (VES-SFE-106) (east of building CPP-603) resulting from a surface spill of CPP-603 fuel storage basin sludge and liquids. CPP-19 is contaminated soil between the Basin Liquid Waste Tank (VES-SFE-106) to the Waste Evaporator Feed Tank (WL-102) resulting from a leak.

3.3.4.1 Utilities and Surface Features. Electrical conduit passes through CPP-11. Multiple VES-SFE-106 structures including the tank, vault, and piping are present beneath Site CPP-11. The 25,000 gallon VES-SFE-106 is located approximately 6 ft bgs. Multiple utility lines pass through CPP-19 including fire water lines, process waste lines, and high pressure steam lines.

3.3.4.2 Excavation and Removal of Contaminated Soils. The remediation of Site CPP-11 involves excavation and removal of the contaminated soils to 5 ft bgs. Shoring may be required. The soil removal will be coordinated with the INTEC CPP 603 Basin Project tasked to remove the VES-SFE-106 tank and vault. The remediation of Site CPP-19 involves excavation and removal of the contaminated soils to 10 ft bgs. A section of the abandoned waste transfer line located 5 ft bgs will be cut and capped. Cut waste transfer line section will be removed under CERCLA and sent to a RCRA treatment, storage, and disposal facility for management.

The estimated volume of contaminated soil for CPP-11 is 1,175 yd^3.

The estimated volume of contaminated soil for CPP-19 is 570 yd^3.

3.3.4.3 Confirmation Soil Sampling. There are no specific design requirements for CPP-11 and, -19 confirmation sampling. The confirmation sampling strategy is described in detail in the Phase II Field Sampling Plan (Attachment 1).

3.3.4.4 Backfill Operations and Site Restoration. The backfill and site restoration for Site CPP-11 will be coordinated with the INTEC CPP 603 Basin Project tasked to remove the VES-SFE-106 tank and vault. The site will be backfilled with clean soil, contoured and graded to maintain existing surface water patterns or as designated in design drawings. The CPP-19 site will be backfilled with clean soil. The estimated volume at CPP-19 is 570 yd^3. Contouring and grading of backfill excavation will be performed to maintain existing surface water drainage patterns or as designated in design drawings.

3.3.5 Remediation of Sites CPP-13 and -93

Site CPP-13 is air-released contamination on the berm resulting from pressurization of calcine storage cyclone. The contamination was covered by 0.5 ft of soil. Site CPP-93 is non-radioactive, simulated mercury-contaminated calcine buried in a trench and covered by 4 ft of backfill.

3.3.5.1 Utilities and Surface Features. CPP-1682 is located near Site CPP-13 along with kerosene tanks and tank containment. Multiple active or abandoned utility lines pass through or are near Site CPP-93. These lines include water line, sanitary waste line, utility tunnel, and electrical duct bank. The transformer station, CPP-1782, and CPP-1864 are located near Site CPP-93.

3.3.5.2 Excavation and Removal of Contaminated Soils. The remediation of Site CPP-13 involves angle excavation up the berm to remove the contaminated soil. Stability of the berm will be analyzed to determine the recommended excavation approach. Closure of Olive Avenue is required during soil excavation and removal. The remediation of Site CPP-93 involves excavation and removal of contaminated soils 8 ft bgs. Shoring may be required.

The estimated volume of contaminated soil for CPP-13 is 685 yd^3.

The estimated volume of contaminated soil for CPP-93 is 3,945 yd^3.

3.3.5.3 Confirmation Soil Sampling. There are no specific design requirements for CPP-13 and -93 confirmation sampling. The confirmation sampling strategy is described in detail in the Phase II Field Sampling Plan (Attachment 1).

3.3.5.4 Backfill Operations and Site Restoration. The sites will be backfilled with clean soil gravel. The estimated volume is 4,630 yd^3. Contouring and grading of backfill excavation will be performed to maintain existing surface water drainage patterns or as designated in design drawings.

3.3.6 Remediation of Sites CPP-35 and -36

Site CPP-35 is a release of decontamination solution through the air transport at CPP-633 located east of CPP-633 adjacent to the bin set berm. Site CPP-36 is contaminated by three separate releases from transfer line leaks from CPP-633 to WL-102.

3.3.6.1 Utilities and Surface Features. Multiple active or abandoned utility lines pass through or are near Site CPP-35. These lines include process waste line, decontamination lines, air instrument/transport lines, and electrical duct bank. Multiple active or abandoned utility lines pass through or near Site CPP-36. These lines include process waste lines, service waste line, sanitary waste

line, nitric acid line, high pressure air lines, high pressure steam line, and utility tunnel. Site CPP-36 is located between the main stack (CPP-708) and the WCF Cap (CPP-633).

3.3.6.2 Excavation and Removal of Contaminated Soils. The remediation of Sites CPP-35 and -36 involves excavation and removal of contaminated soils to 10 ft bgs. Shoring may be required. Because of the complexity of the underground utilities and nearby structures, a phased excavation approach may be recommended.

The estimated volume of contaminated soil for CPP-35 is 1,405 yd^3.

The estimated volume of contaminated soil for CPP-36 is 2,510 yd^3.

3.3.6.3 Confirmation Soil Sampling. There are no specific design requirements for CPP-35 confirmation sampling. Confirmation sampling may not be possible for CPP-36 with the use of shoring in the excavation design due to the anticipated high radionuclide contamination in the soil. The general confirmation sampling strategy is described in the Phase II Field Sampling Plan (Attachment 1).

3.3.6.4 Backfill Operations and Site Restoration. The sites will be backfilled with clean soil gravel. The estimated volume is 3,915 yd^3. Contouring and grading of backfill excavation will be performed to maintain existing surface water drainage patterns or as designated in design drawings.

3.3.7 Remediation of Site CPP-124

Site CPP-124 is a potential contamination site where the underground process condensate transfer pipe from CPP-604/605 to the service waste system at or near CPP-709 leaked. There currently are no analytical data for Site CPP-124 and characterization of the site is planned.

3.3.7.1 Utilities and Surface Features. Active or abandoned utility lines pass through or are near Site CPP-124.

3.3.7.2 Excavation and Removal of Contaminated Soils. Future sampling and analysis results will determine whether remediation of Site CPP-124 is required.

3.3.7.3 Confirmation Soil Sampling. The confirmation soil sampling strategy is described in detail in the Field Sampling Plan (Attachment 1).

3.3.7.4 Backfill Operations and Site Restoration. If excavation is required for Site CPP-124, the site will be backfilled with clean soil.

3.3.8 Remediation of Site CPP-81

Site CPP-81 is the 68-ft length of abandoned vessel off-gas line that contains elevated levels of nonradioactive hazardous constituents. Remediation of this site includes the excavation and removal of the line while retaining of the line's contents.

3.3.8.1 Utilities and Surface Features. Buildings CPP-620 and CPP-637 were removed from over site CPP-81 in 2004 and the area is currently vacant. Existing along with the abandoned vessel off-gas line are several other abandoned utilities.

3.3.8.2 Excavation and Removal of Contaminated Soils. Remediation of Site CPP-81 involves the excavation and removal of the abandoned vessel off-gas line along with the other nearby abandoned utilities. Sufficient excavation of soils will be performed to fully remove the abandoned lines.

3.3.8.3 Confirmation Soil Sampling. Site CPP-81 contains no COCs. Confirmation sampling will not be performed.

3.3.8.4 Backfill Operations and Site Restoration. No release to the environment has occurred in the area due to the vessel off-gas line so soils excavated from the site are planned to be used as backfill. Additional cleans soils will be brought in, as necessary, to complete required contouring and grading of the areas as designated in the design drawings.

4. REMEDIAL ACTION WORK PLAN

This section presents the approach to conducting the Group 3, Other Surface Soils site remediations, including the remedial action work elements, the associated project cost and schedule, and the documentation required at completion of the remedial actions.

4.1 Remedial Action Work Elements

This section identifies and describes the work elements required to implement and complete the remediation of the Group 3, Other Surface Soils sites. Work will be performed in accordance with the approved Health and Safety Plan (PLN-2128) and this Work Plan. Modifications to this Work Plan will follow the procedure outlined in Section VIII, Subsection J of the FFA/CO for modifications to a Final Primary Document (DOE-ID 1991). The work elements comprising this remedial action consist of earthwork, including excavation of soils and rerouting or cutting and capping utility lines, followed by real-time soil spectroscopy and confirmation sampling. Real-time soil spectroscopy is also discussed in Section 3.3.1.1.

The following sections describe the general sequencing activities for site characterization operations and site remediation. The Site Characterization Operations section summarizes the general characterization activities during site remediation. Additional site characterization details can be found in the Group 3 Phase II Field Sampling Plan (see Attachment 1). The Group 3 Phase II sites remedial action sections outline a stepwise sequence with general descriptions for site setup, excavating contaminated soil, real-time soil spectroscopy, backfill operations, confirmation sampling and waste management.

4.1.1 Site Characterization Operations — General Sequencing

Group 3 Phase II site characterization operations will be performed prior to commencing soil excavation, during excavation operations and following the completing of excavation activities. Phase II characterization operations begin with initial site characterization using definitive sampling methods and direct push probe sampling and/or gamma logging. Characterization operations also include real-time soil spectroscopy during excavation and post excavation confirmation sampling and analysis. The following sections describe the general steps in performing site characterization operations.

4.1.1.1 Initial Site Characterization Steps. Initial site characterization is required for sites included in this RD/RA Work Plan with no historical existing site characterization data. Pre-remediation characterization sampling and analysis will be performed by collecting grab samples, by using direct push probes with sampling capabilities or by hand augering to collect samples. The following site will require initial characterization sampling and analysis:

- CPP-124 – Leak east of CPP-601.

The initial characterization operations for this site are sequenced in Steps 1 through 7. These sequencing steps are subject to change based upon the detailed sequencing requirements submitted by operations personnel or the subcontractor performing the work.

Step 1 – Site mobilization

Step 2 – Establish site survey controls and grids

Step 3 - Install direct push probes or hand augering to depth

Step 4 – Collect characterization samples

Step 5 – Handle, package, and label samples

Step 6 – Ship samples to a certified laboratory

Step 7 – Site cleanup and demobilization.

These steps are further outlined and detailed in the Field Sampling Plan. Once the laboratory analyses have been completed, verified, and validated, the data will be used to further assess the remedial design /remedial action approach as defined in this Work Plan or alternative action (i.e., no remediation required).

The Group 3 Phase II soil sites with COC above the remediation goals as described in Section 2.1 have sufficient existing (historical) data (see Appendix A) to proceed with site remediation. No additional pre-remediation characterization sampling and analysis is required at these sites prior to beginning excavation operations described in the following sections. Additionally, sufficient analytical data exists to meet the ICDF waste acceptance criteria for disposal and prepare a material profile.

4.1.1.2 Real-Time Spectroscopy Steps

Real-time spectroscopy during excavation (as described in Section 3.2.1) will be performed using field gamma and possibly beta detection instruments. The real-time soil spectroscopy operations are sequenced in Steps 1 through 7. These sequencing steps are subject to change based upon unique site conditions and restrictions.

Step 1 – Site mobilization

Step 2 – Perform a baseline or initial real-time spectroscopy of the site (optional)

Step 3 – Excavation begins and sloped to allow access

Step 4 – Perform area gamma and spectroscopy

Step 5 – Record hot spots locations and continue excavation

Step 6 – Repeat Step 4 and 5 until soil contamination is below remediation goals

Step 7 – Collect confirmation samples.

These steps are further outlined in the Field Sampling Plan (Attachment 1). Soil contamination will be excavated to a maximum depth of 10 ft bgs. Real-time spectroscopy will be used to determine soil contamination in soil above 10 ft bgs. Real-time spectroscopy will be used to determine when the excavation is complete and the remediation goals have been met. Unexpected contamination that may be encountered in soil above 10 ft bgs will be managed according to the approach described in Section 1.3.3.

4.1.1.3 Confirmation Sampling Steps

Confirmation sampling, as described in the Field Sampling Plan (Attachment 1), will be performed following excavation on those soils less than 10 ft bgs. Confirmation sampling operations are sequenced in Steps 1 through 6. These steps are subject to change based upon the detailed sequencing requirements submitted by operations personnel or the subcontractor performing the work.

Step 1 – Site mobilization

Step 2 – Establish site survey controls and grids

Step 3 – Collect confirmation samples

Step 4 – Handle, package, and label samples

Step 5 – Ship samples to the laboratory

Step 6 – Site cleanup and demobilization.

These steps are further outlined and detailed in the Field Sampling Plan. Once the laboratory analyses have been completed, verified, and validated, the information will be used to certify the Group 3 Phase II soil site has been remediated and contamination is below the remediation goals.

4.1.2 OU 3-13 Group 3 Phase II Sites Remedial Action — General Sequencing

The OU 3-13 site area excavation, waste removal, mass backfill, final grading and contouring, and final site restoration or re-vegetation operations are sequenced in Steps 1 through 10. These steps are:

Step 1 – Site mobilization

Step 2 – Establishment of perimeter fencing and site boundary

Step 3 – Establishment of decontamination areas and systems

Step 4 – Location and isolation of utilities

Step 5 – Soil excavation

Step 5a – Excavation of OU 3-13 site area limits to design depths or 10 ft bgs

Step 5b – Iterative excavation and real-time soil spectroscopy to meet remediation goals in remaining soil above 10 ft bgs

Step 6 – Final field confirmation sampling and spectroscopy of excavation

Step 7 - Backfill operations

Step 8 – Installation of final permanent utilities/structures

Step 9 – Final grading and contouring

Step 10 – Removal of decontamination areas/fencing/and other temporary construction and demobilization

4.1.2.1 Site Mobilization (Step 1). Mobilization is the work performed in preparation for construction activities. This work generally implements the project and site-required administrative, engineering, and health and safety controls. Mobilization will include such activities as setup of site offices; demarcation of parking areas, equipment and material laydown areas, and work zones; and installation of signs, postings, and fences. Required lay down areas, work zones, and postings will be set up and maintained for each phase of the remediation. Coordination of the remediation activities will be required between project and facility personnel to ensure that these activities have minimal impact on facility operations and maintenance.

Site preparation includes utility identification and isolation, security fencing/barrier installation (if necessary), site layout and surveying, establishment of storm water runoff barriers and collection points, setup of a temporary decontamination station, set up of dust control operations, and any required air monitoring. These activities are briefly discussed in the following sections.

4.1.2.2 Establishment of Perimeter Fencing and Site Boundary (Step 2). Temporary security barriers and/or fencing and access-control fencing will be installed to restrict unauthorized personnel into the work area. Existing barriers and/or fencing that will be impacted by remediation activities will be removed and/or relocated where necessary. Existing fencing around portions of the site may be used to establish the access control boundary. Ingress and egress control of contaminated areas will be defined in the Health and Safety Plan.

4.1.2.3 Establishment of Decontamination Areas and Systems (Step 3).

The remediation operations will establish appropriate equipment and transport vehicle decontamination areas and/or systems as necessary to assure the containment of contamination within the specific site boundary. This delineation is necessary to assure that contamination is not spread from the specific site boundary to the surrounding areas at INTEC and transportation roadways to the ICDF for waste disposal.

These decontamination areas and systems will use the best available technology to provide adequate decontamination of equipment and transport vehicles while minimizing the generation of secondary waste streams.

4.1.2.4 Location and Isolation of Utilities (Step 4).

The specific site utilities will be located in the field using the existing as-built engineering drawings and physical surveys of field conditions. These utilities will be managed as shown on design drawings to allow the excavation to be completed to the required depth to meet the remediation goals. Once the remediation has been accomplished, these utilities will be reinstalled/rerouted/replaced as shown on the design drawings prior to and/or in conjunction with backfill operations.

4.1.2.5 Soil Excavation (Step 5).

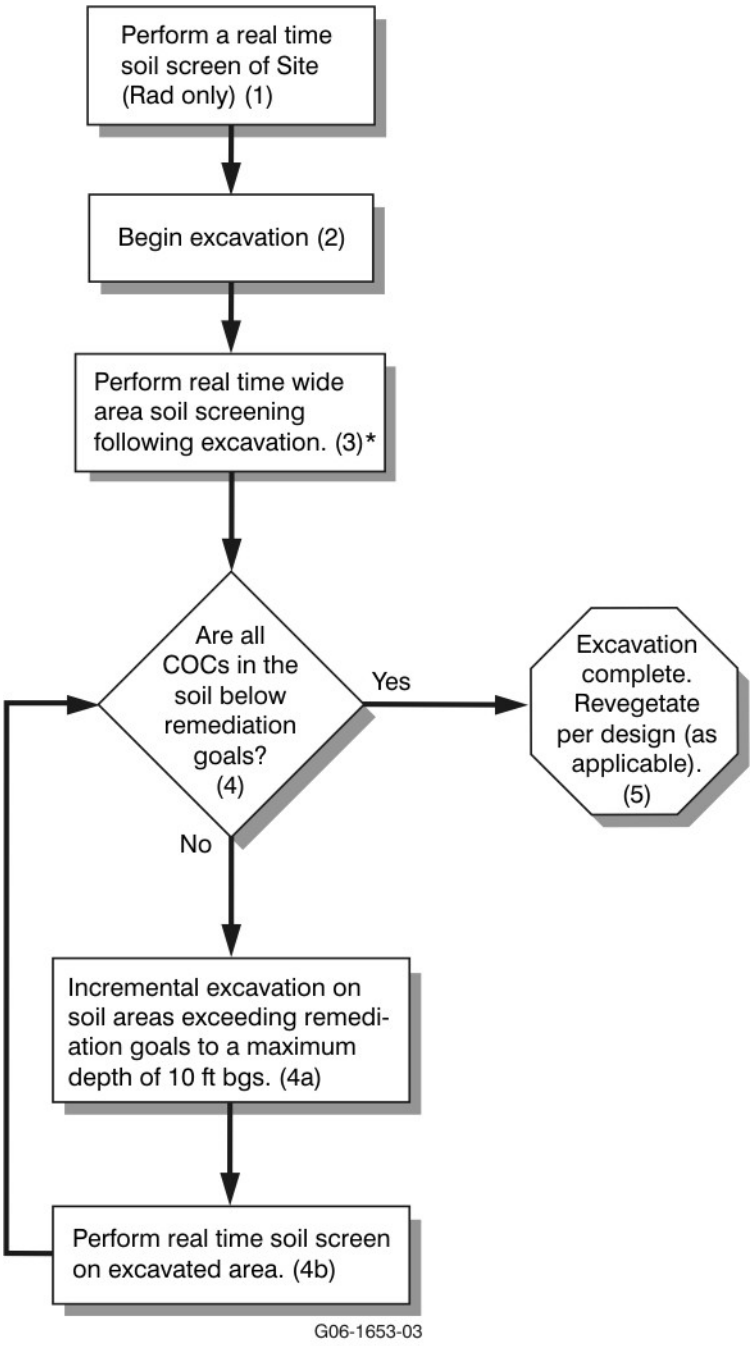
Real-time soil spectroscopy will be performed during the excavation. The flow chart presented in Figure 4-1 illustrates the excavation process and identifies when the excavation is complete. (The steps in the Figure 4-1 flow chart do not correlate to the overall remediation steps in Section 4.1.2.) There will be no excavation beyond 10 ft bgs for any Group 3 Phase II sites.

(Step 5a). The general sequencing of excavation activities is as follows:

- Excavation will typically proceed in accordance with design specification and field operation work control documentation.
- A water truck or other forms of water distribution equipment will be used for dust control (additional water spray systems may be required at the dig face during excavation operations).
- Material will be excavated and moved to the edge of the excavation for loading into selected transportation equipment.
- Roll-offs with plastic liners or dump trucks with solid formed dump bed (designed to avoid leakage of materials) will be loaded by the excavator or loader and moved to the decontamination station without entering the zone of contamination.
- Loaded roll-offs or dump trucks will be surveyed for radiological contamination and be decontaminated, if necessary. Any dirt or mud on the truck chasse will be removed by the laborers working at the decontamination station.
- The roll-offs, transport trucks, or soft-sided backs will be used to transfer the soil and debris to the ICDF, where ICDF Operations will review the waste manifests, accept the truck, and dispose of the soil.

(Step 5b). Real-time field spectroscopy and contamination removal accomplished by additional excavation of hot spots to the pre-established 10 ft bgs or design depth is an iterative process that must be worked dependent upon field conditions.

Controls will be established to address potential runoff of contaminated materials from excavations and work activities to waters of the U.S. These controls will meet the applicable and relevant requirements in the INEEL Interim Pollution Prevention Plan for industrial activities (Janke 2000), or construction activities (DOE-ID 1998), as applicable. Controls typically established include, but are not be limited to, control and containerization of contaminated soils; stockpiling and control of soils meeting the reuse criteria; providing for equipment maintenance and storage so that drips and spills are not released to the environment (e.g., tarps or soil lockdown materials are used); providing erosion and sediment controls for the worksite; and, as necessary, directing clean runoff away from the remediation area. It is not anticipated to control any runoff from the site.



Note: *If unexpected contamination or high radiation levels are encountered see Section 1.3.3 and Figure 1.4. Real time screening will also be performed at site CPP-93 for Hg.

Figure 4-1. Excavation and real-time spectroscopy flow chart.

4.1.2.6 *Final Field Confirmation Sampling and Geophysical Survey of Excavation (Step 6).*

The final field confirmation sampling will be performed to verify that remediation goals have been met as described in the Field Sampling Plan (Attachment 1). The excavation will be surveyed to establish backfill material needs.

4.1.2.7 *Backfill Operations (Step 7).*

Following verification that the remediation goals have been met, the excavation will be backfilled. Backfill will be placed and compacted to meet the requirements for future use of the site.

4.1.2.8 *Reinstallation of Structures/Equipment/Utilities (Step 8).*

Structures, facility equipment, and utilities will be reinstalled and tested as required. Security barriers/fencing and animal control fencing will be reinstalled as required. Reinstallation will be performed in conjunction with backfill operations.

4.1.2.9 *Final Grading and Contouring (Step 9).*

Final grading, contouring of the site topography, and placement of topsoil and revegetation will be performed as required.

4.1.2.10 *Removal of Decontamination Areas/Fencing/and other Temporary Construction and Demobilization (Step 10).*

Removal of the temporary decontamination station will include final sampling and transfer of wash water to the ICDF evaporation pond for disposal per the project Waste Management Plan (Attachment 2). Site cleanup and demobilization will include removal of equipment and reposting of the site boundary.

4.2 Project Cost Estimate

The project costs are estimated to be $8,760,000. The project cost estimate is provided in Appendix D.

4.3 Project Schedule

The remedial action schedule for Group 3 is presented in Appendix C and includes the project tasks from the finalization of the Phase II RD/RA Work Plan (Remediation Sets 4-6) through performance of the remedial action and submittal of the Phase II Completion Report. The schedule does not include any contingency for delays due to weather or other causes outside the control of the project team. Table 4-1 shows the targeted activities associated with the Group 3 Other Surface Soils Remediation Sets 4-6 (Phase II) Removal Project.

Table 4-1. Summary of major Group 3 Phase II reports.

Group 3 Activities	Target Date	Enforceable Milestone
Submit Pre-final Inspection Report	TBD	—
Submit Draft Group 3 Phase II RA Report	TBD	May 11, 2012

4.4 Field Documentation

Accurate and timely documentation of field and associated activities is essential to satisfy final document requirements as defined in the FFA/CO. Project personnel are responsible for maintaining a project logbook in which project-related activities are recorded. Information recorded, at a minimum, shall include:

- Chronology of events such as notice to proceed, project start/finish dates
- infrastructure modifications
- soil volumes excavated
- issues encountered during remediation activities and resolutions applied
- backfilling and reclamation activities
- waste management
- Sampling events
- Depths and dimensions of excavations.

4.5 Inspections and Inspection Reports

Upon completion of remedial action activities, a pre-final inspection will be performed at the discretion of the Agency project managers or designees. Periodic inspections can occur at any time during remediation activities and will be conducted to finalize project work elements. The inspection will establish compliance with the remedial design for each site, the remediation activities outlined in this Work Plan, and with requirements outlined therein.

4.5.1 Pre-final Inspection

Pre-final inspections are performed by the Agencies or their designees typically at the completion of the remedial action construction activities at each soil site to determine the status of those activities and to identify outstanding construction requirements and actions necessary to resolve any issues identified. The pre-final inspections will occur following backfill and site restoration. Results from the pre-final inspections will then determine the date for the final inspection.

4.5.1.1 Pre-final Inspection Checklist. A checklist will be developed for each soil site to be used during the pre-final inspection to document any unresolved or open items and the required actions for their resolution or completion. The checklist will contain specific project systems, components, or other areas agreed upon by the Agencies that will be inspected for acceptance of construction activities. The focus is on remedial action elements significant to meeting the requirements of the ROD. Backup sheets may be required to describe each item on the checklist and the criteria for acceptance/rejection of each item. A template for a pre-final inspection checklist is included in Appendix E.

Results of inspections will be documented in a Phase II Pre-Final Inspection Report, which will be issued as a letter report and will contain the following:

- The names of inspection participants.
- Specific project elements/hold points that were inspected.
- Completed pre-final inspection checklist documenting the performance of the inspection and inspection findings.
- Open items identified during the inspections.
- Corrective actions to be taken to close open items or to correct deficiencies, acceptance criteria or standards, and planned dates for completion of the actions. A corrective action plan may be developed to address open items or deficiencies that cannot be closed during the pre-final inspection.

- Date of final inspection (if required).

4.5.2 Final Inspection and Final Inspection Report

The Agency project managers will determine the need for a final inspection based on the results of the pre-final inspections and the content of pre-final inspection reports. Final inspections will verify the closure of open items from the pre-final inspections and will confirm and document that the remediation goals have been met. The final inspection, conducted by the Agency project managers, will confirm the resolution of outstanding items identified in the pre-final inspection and verify that the remediations have been completed in accordance with the requirements of the OU 3-13 ROD (DOE-ID 1999a). The results of the final inspection will be incorporated in the Group 3 Remedial Action Report. Information collected as part of the final inspection and final inspection report will be no less than that collected during a pre-final inspection and pre-final inspection report.

4.6 Phase II Remedial Action Report

The Phase II Remedial Action Report will be prepared following remediation of soil sites included in the Phase II Work Plan. A draft of the report will be due 60 days after the completion of the final inspection. The Group 3, Other Surface Soils Group will prepare separate remedial action reports—one for Phase I and the second for Phase II soil sites. The remedial action reports will include the following:

- Introduction to include site descriptions and histories
- Summary of the remedial design
- Remediation and demolition activities description including site mobilization and infrastructure establishment, demolition, excavation, and area completion
- Chronology of events
- Performance standards and construction quality control to include a summary of sampling activities and results
- Final inspection and certification
- As-built drawings showing final contours and configurations
- Final total costs of the Phase II remedial action
- Operation and maintenance
- Project contact information
- Observations and lessons learned.

The Phase II Remedial Action Report will be a primary document, subject to the standard FFA/CO review cycle for primary documents.

4.7 Waste Management and Tracking

Management of wastes generated from these remediation activities are addressed in the Waste Management Plan (Attachment 2). The Waste Management Plan (DOE-ID 2006b) provides identification of each waste stream, describes waste minimization actions, and provides requirements for waste tracking, storage, and ultimate disposal. The Waste Management Plan describes the waste to be generated, waste minimization, waste characterization strategy, on-Site management and disposition, and off-Site disposition.

5. RELEVANT CHANGES TO THE RD/RA SCOPE OF WORK

The RD/RA strategies for completing remediation of WAG 3 were summarized in the OU 3-13 RD/RA Scope of Work (DOE-ID 2000). The scope and strategy for remediation of Group 3, Other Surface Soils is found in Section 4.3.3 of the RD/RA Scope of Work. In the RD/RA Scope of Work description of the *Operable Unit 3-13, Group 3, Other Surface Soils, Prioritization and Site Grouping Report*, it was assumed that the Group 3 sites would be grouped into approximately five sets. The Prioritization Report resulted in six sets of sites to be remediated in two phases (DOE-ID 2002a). A letter from DOE to EPA and Idaho Department of Health and Welfare documented the following approach to phasing remediation of the Group 3 sites.[i] Minor changes to the described scope are discussed in Section 6.1 of the Group 3 Phase I RD/RA Work Plan. This Phase II RD/RA Work Plan contains no additional changes to the RD/RA Scope of Work.

i. Request for a milestone extension related to submission of Phased WAG 3, Group 3 RD/RA Work Plans, EM-ER-03-063, March 5, 2003.

6. ENVIRONMENTAL, HEALTH & SAFETY, AND QUALITY ASSURANCE

The Miscellaneous Site Program Health and Safety Plan (ICP 2006c) provides safety guidance applicable to project personnel. The Health and Safety Plan provides oversight, construction management support, and sampling activities for the remedial action. The Health and Safety Plan is a working document and will be reviewed and modified accordingly as the project planning documents are developed and finalized. The Health and Safety Plan covers the following safe-working areas of concern:

- Task-site responsibility
- Personnel training
- Occupational medical program and medical surveillance
- Safe work practices
- Site control and security
- Hazard evaluation
- Personal protective equipment
- Personnel decontamination and radiation control
- Emergency response for the project sites.

Safe work documents, such as radiation work permits and job safety analyses, will be developed in accordance with existing INL procedures and systems to implement the Health and Safety Plan requirements. They will be modified, supplemented, or generated (as necessary) during the work activities to address changing conditions onsite or revisions to the work methods described in the planning documents.

6.1 Spill Prevention/Response Program

A separate Spill Prevention and Response Plan is not necessary to implement the remedial actions for the Group 3, Other Surface Soil sites. In the event of a spill, the INTEC emergency response plan referenced in the Health and Safety Plan will be activated. Materials and substances on the work site will be stored and handled in accordance with the applicable regulations and will be stored in approved containers.

6.2 Quality Assurance

The quality program for Idaho Completion Project is described in applicable company policies and procedures. Applicable company policies and procedures, the Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Inactive Sites (DOE-ID 2002b), and this Work Plan govern the functional activities, organizations, and quality assurance/quality control protocols that will be used for this project. Where applicable, the project specifications give the quality assurance/quality control procedures for a given task, consistent with guidance provided in applicable company procedures and the safety category designation.

7. FIVE-YEAR REVIEW

As specified by Section 12.6 of the OU 3-13 ROD, the entire area of INTEC covered by the ROD will be included in a single periodic five-year review (DOE-ID 1999a).

If, following remediation of these sites, contaminants remain at the sites above levels that allow for unlimited use and unrestricted exposure, the action will be reviewed no less often than every five years as part of the INL Sitewide Five-Year Review.

Five-year reviews will be conducted by DOE for remediated sites with institutional controls at least until 2095 (i.e., until the 100-year institutional control period expires) or until it is determined during a five-year review that institutional controls and five-year reviews are no longer necessary. The Agencies may also determine that, in the case of a remedy that is no longer meeting performance standards, modifications to the remedy are required.

8. INSTITUTIONAL CONTROLS

The institutional controls at the INL are based on guidance in the May 3, 1999, U.S. Environmental Protection Agency (EPA) "Region 10 Final Policy on the Use of ICs at Federal Facilities" (EPA 1999); the September 29, 2000, EPA guidance "Institutional Controls: A Site Manager's Guide to Identifying, Evaluating, and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups" (EPA 2000); and the April 9, 2003, DOE policy "Use of Institutional Controls" (DOE P 454.1).

With the exception of Waste Area Groups 8 and 9, institutionally controlled sites are assessed and maintained on a sitewide basis. These activities are conducted in accordance with the requirements specified in decision documents that have been consolidated into the *Idaho National Engineering and Environmental Laboratory Sitewide Institutional Controls Plan* (DOE-ID 2004b). Consolidation of the institutional controls process has resulted in consistent implementation, maintenance, and inspection of institutional controls sitewide at INL.

Group 3 Phase II sites with hazards that preclude release for unrestricted residential use will retain institutional controls and be assessed, maintained, and reported annually. New sites that are identified as having unacceptable risk and determined by the regulatory agencies to be action or no-further-action sites have institutional controls and are included in the annual assessment, maintenance, and reporting program.

9. REFERENCES

40 CFR 264.310, 2002, "Standards for Owners and Operators and Hazardous Waste Treatment, Storage, and Disposal Facilities, Subpart G, Closure and Post-Closure Care," *Code of Federal Regulations,* Office of the Federal Register, July 2002.

42 USC 9601 et seq., 1980, "Comprehensive Environmental Response, Compensation, and Liability Act," *United States Code*.

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DOE-ID, 1999b, *Work Plan for Waste Area Groups 6 and 10, Operable Unit 10-04, Comprehensive Remedial Investigation/Feasibility Study*, DOE/ID-10554, U.S. Department of Energy Idaho Operations Office, April 1999.

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DOE-ID, 2005a, *Operable Unit 3-14 Tank Farm Soil and Groundwater Remedial Investigation/Baseline Risk Assessment*, DOE/NE-ID-11227, Rev. 0, December 2005.

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Appendix A

Sampling/Borehole Figures and Existing Data Summary Tables

Appendix A

Sampling/Borehole Figures and Existing Data Summary Tables

The following data tables for Group 3 Phase II sites were prepared using the sampling and analysis data reported in the OU 3-13 Track 2 Investigation (DOE-ID 1995) and the OU 3-13 RI/FS (BRA) (DOE-ID 1997a), Appendix G. Only data reported in these documents from ground surface to approximately 10 feet bgs are included in this data set. Phase II site sampling and analysis data from depths below 10 feet were useful in the development of previous OU 3-13 decision documents and will be used to establish future institutional controls.

The list of constituents in the following tables was compiled, primarily, from three documents. It includes those elements/compounds previously detected and formally reported in the Track 2 Investigation (DOE-ID 1995) and the RI/FS (DOE-ID 1997a), were identified as contributing to the Hazard Index, and additional constituents that are subject to restrictions imposed by the ICDF waste acceptance criteria. The constituents identified in the ICDF waste acceptance criteria are included because they are important for determining an acceptable location in which to dispose of the contaminated media removed during the OU 3-13 sites remediation, but are not otherwise significant contributors to the Hazard Index. Their inclusion in the list does not imply that they are present at the sites.

The data presented for the Track 2 and RI/FS investigations was previously summarized in the ROD, and are included here for completeness for the depth range 0 to 10 ft below ground surface. All additional data was collected in subsequent investigations. The inclusion of a constituent in this list does not imply its presence at any particular site, or if it was ever analyzed for and detected. Presence of a constituent in the list does indicate that the constituent is a chemical of concern, as identified in the ROD as contributing to the Hazard Index, or of concern for meeting disposal criteria.

Positions in the tables without an entered value (i.e., blank) indicate that: (1) the constituent was not analyzed for, or (2) the constituent was analyzed for and the results were rejected during the data review process, and are reported in above referenced documents.

The inclusion of a constituent in the list does not imply its presence at a particular site, or if it was ever analyzed for and detected. Its presence does indicate that sampling and analyses have been conducted at one or more INTEC sites and that it was previously identified as a potential contaminant of concern at INTEC. Entries in the corresponding adjacent columns having a numerical value, ND, or qualifier flag specifically indicate that sampling and analyses were conducted at this site and the results are as indicated. Rejected data reported in previous decision documents was not included in the ROD and will not be included in this data set.

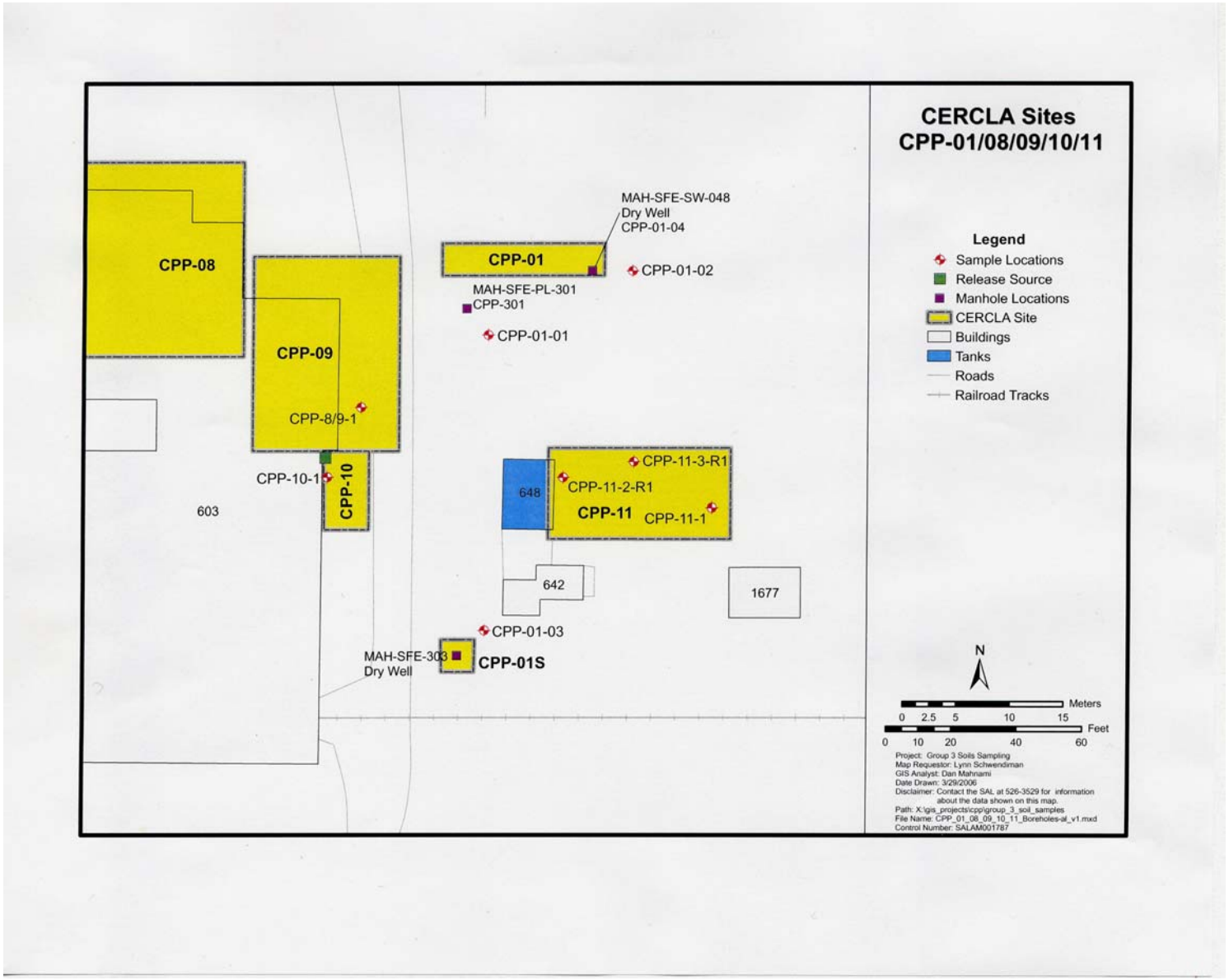


Figure A-1. CERCLA Sites 01/08/09/10/11.

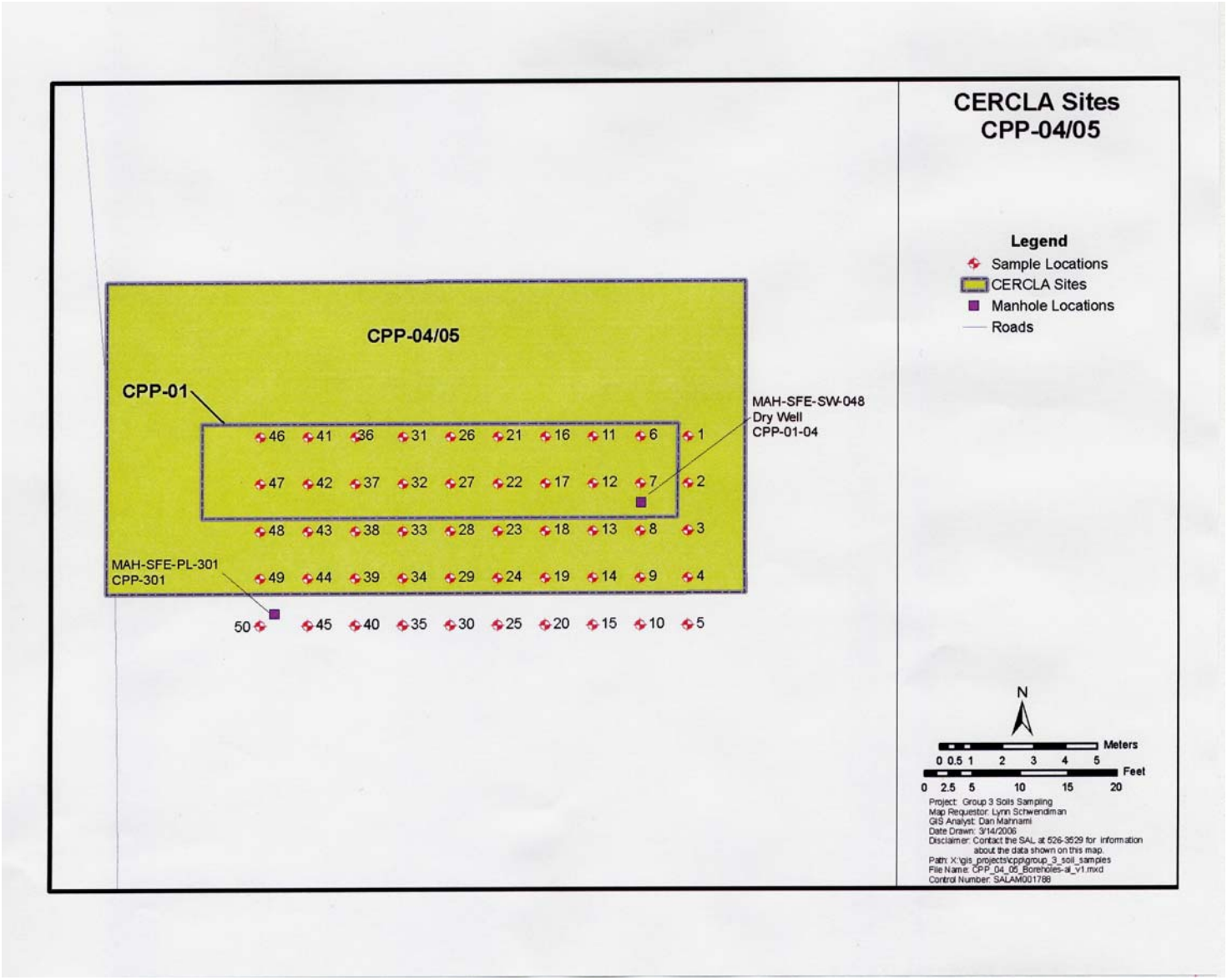


Figure A-2. CERCLA Sites CPP-04/05

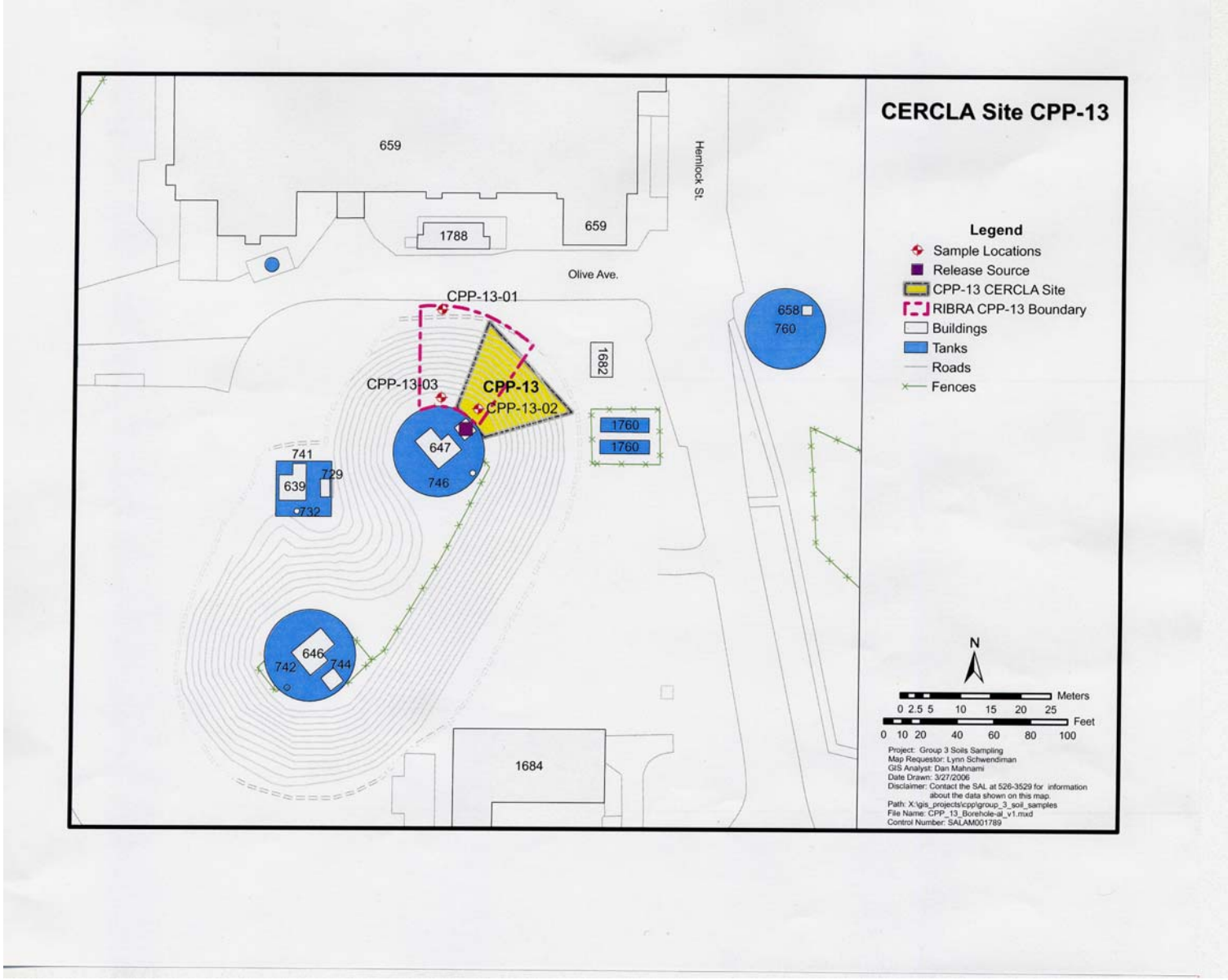


Figure A-3. CERCLA Site CPP-13.

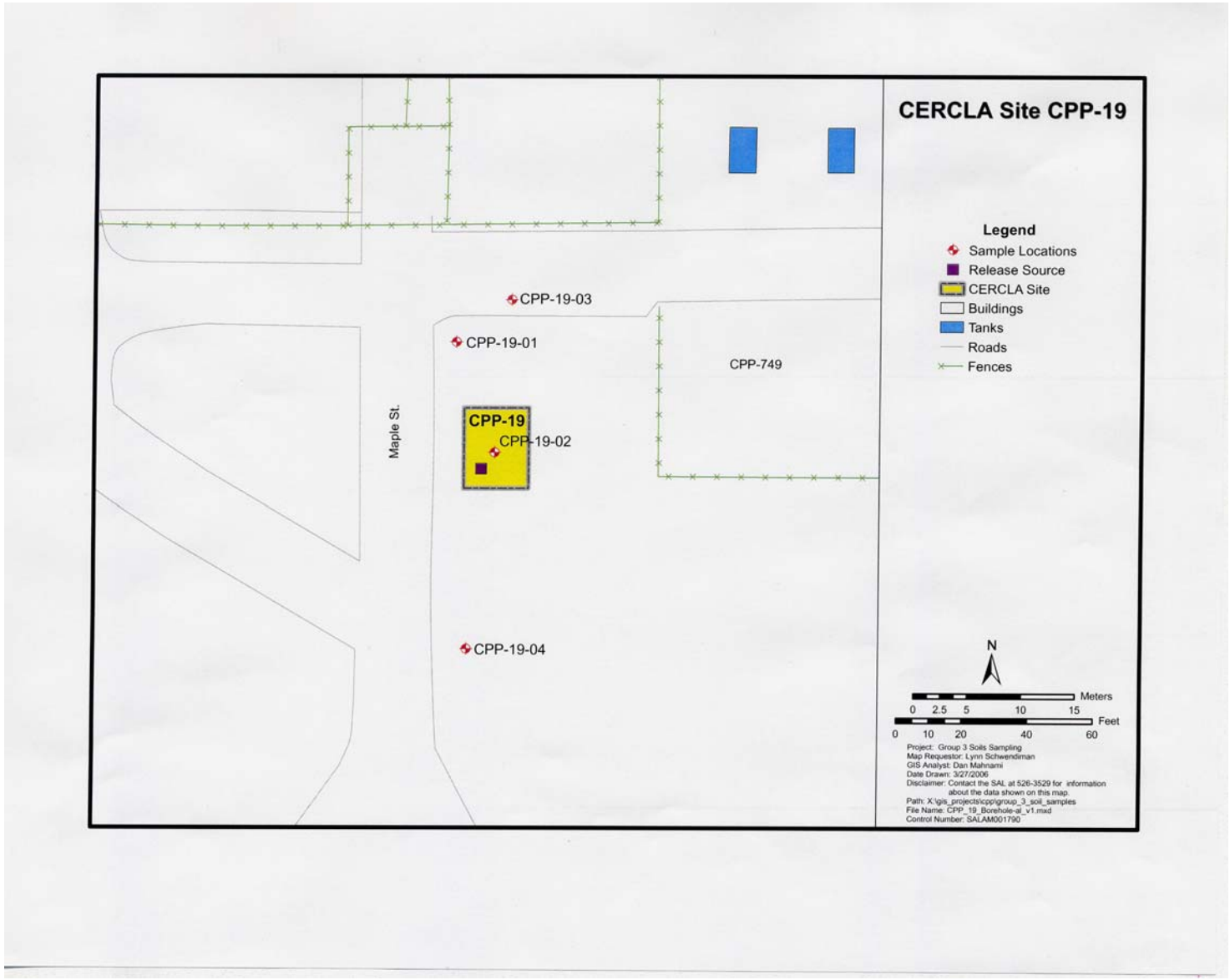


Figure A-4. CERCLA Site CPP-19.

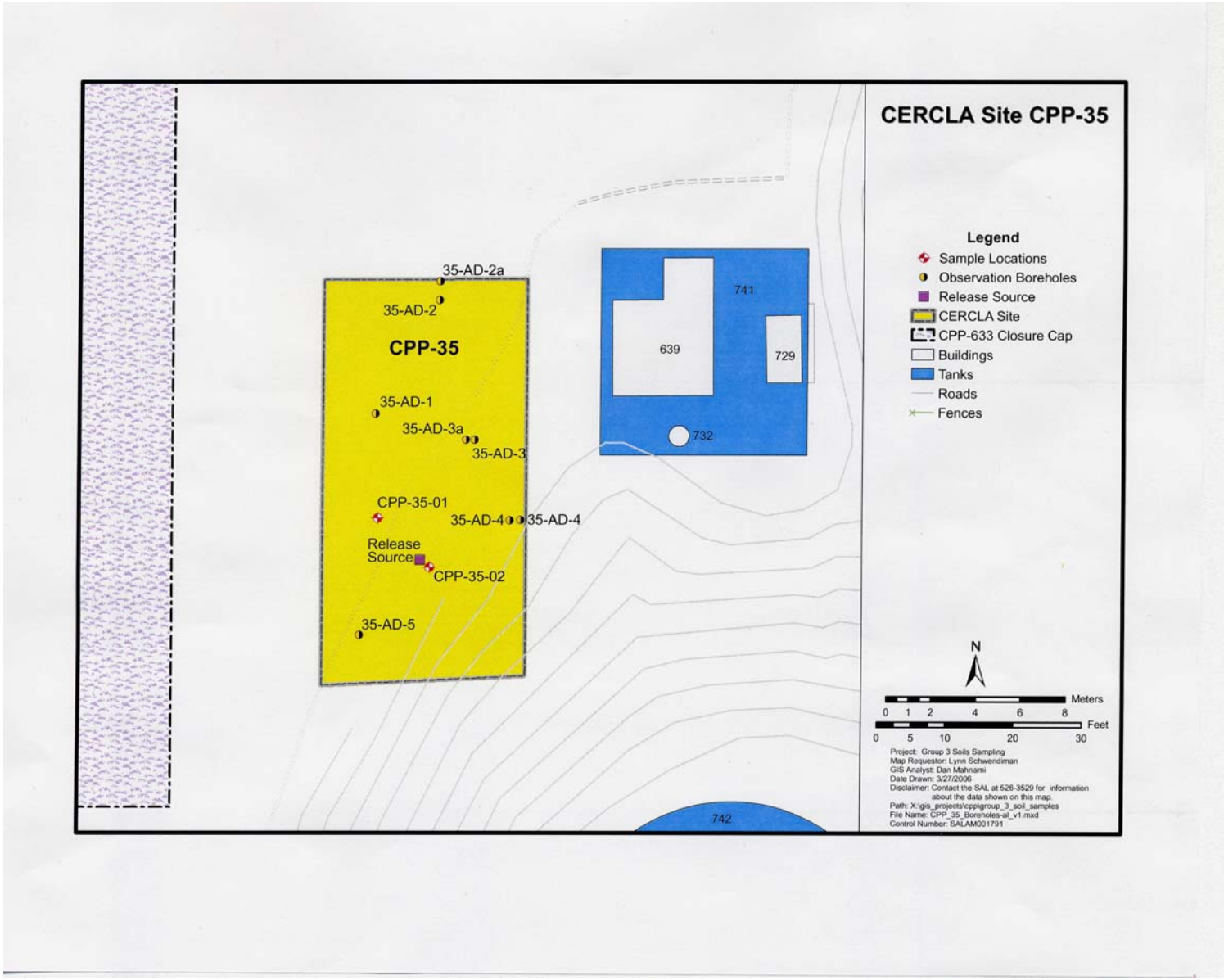


Figure A-5. CERCLA Site CPP-35.

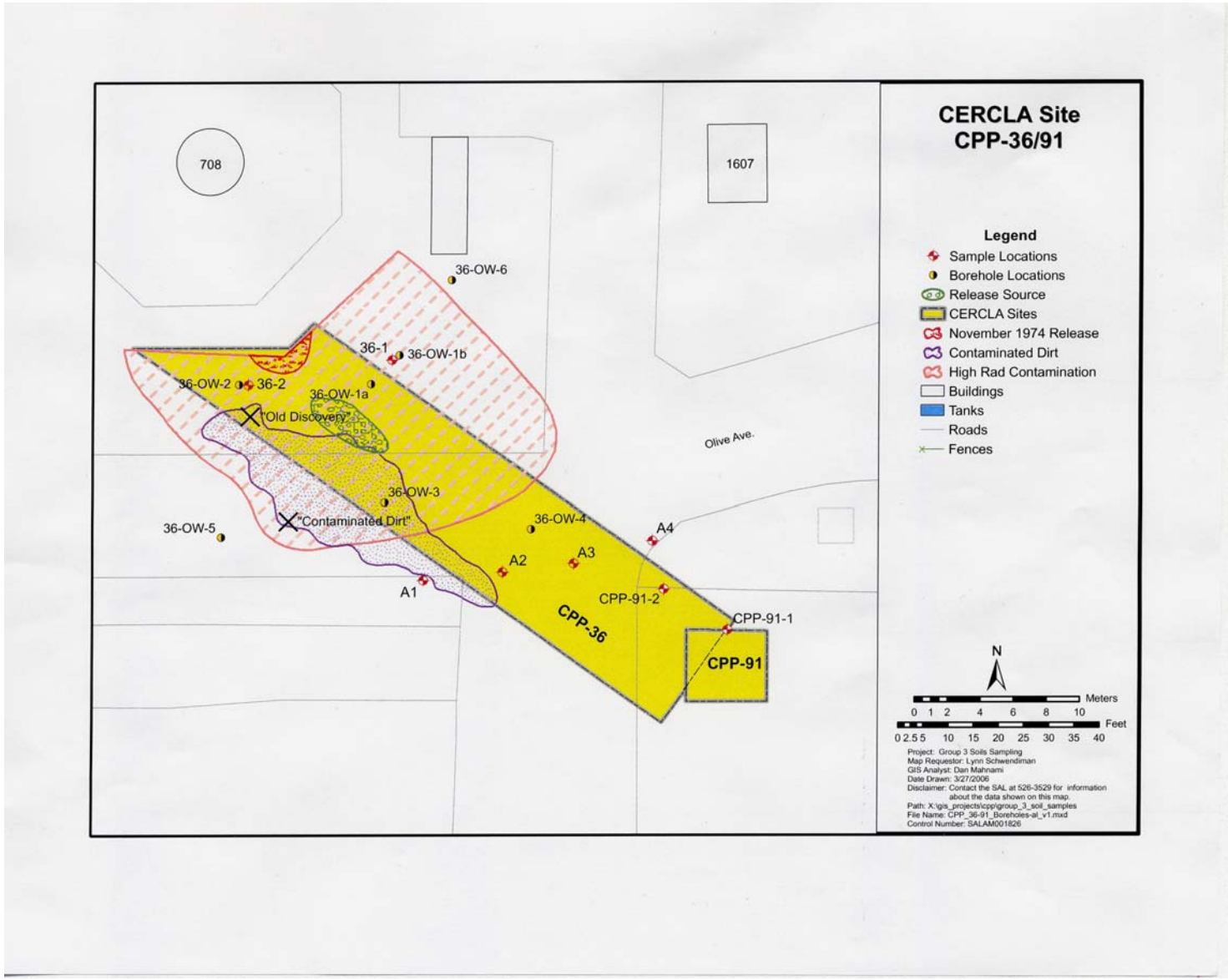


Figure A-6. CERCLA Site CPP-36/91.

Figure A-7. Sample locations at site CPP-129.

Appendix A
Existing Data Summary Tables

Table A-1. CPP - 01 - concrete settling basins and dry wells east of CPP-603.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 01 - 1 (pCi/g) Sample Depth (ft) 0 - 0.5	CPP 01 - 1 (pCi/g) Sample Depth (ft) 2 - 4	CPP 01 - 1 (pCi/g) Sample Depth (ft) 6 - 8	CPP 01 - 2 (pCi/g) Sample Depth (ft) 0 - 0.5	CPP 01 - 2 (pCi/g) Sample Depth (ft) 0.5 - 2	CPP 01 - 2 (pCi/g) Sample Depth (ft) 0.5 - 2[z]	CPP 01 - 2 (pCi/g) Sample Depth (ft) 8 - 10	CPP 01 - 3 (pCi/g) Sample Depth (ft) 0 - 0.5	CPP 01 - 3 (pCi/g) Sample Depth (ft) 2 - 4	CPP 01 - 3 (pCi/g) Sample Depth (ft) 8 - 10
Organics				Not Analyzed									
Inorganics													
Cadmium (ug/g)		3.6E+03		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Radionuclides													
Ag-108m		8.0E + 05											
Am-241		1.0E + 04	2.9E+02					ND					
Am-243		3.3E + 02											
Ba-137m		NA											
C-14		3.0E + 03											
Cd-113m		1.6E + 06											
Ce-144		1.8E + 03											
Co-57		3.7E + 03		ND	1.0E+00	ND	ND	ND	ND	ND	ND	ND	ND
Co-60		1.9E + 08		ND	ND	ND	ND	1.4E+00	ND	6.7E+00	ND	ND	3.0E+00
Cs-134		1.1E + 07											
Cs-137		2.3E + 12	2.3E+01	2.6E+01	7.4E+00	1.3E+00	1.3E+01	1.6E+02	6.0E+01	3.9E+03	8.3E+01	2.2E+02	1.8E+03
Eu-152		9.7E + 08	2.7E+02	5.6E+00	ND	ND	2.2E+00	1.0E+02	5.4E+01	ND	ND	ND	ND
Eu-154		8.2E + 08	5.2E+03	ND	ND	ND	ND	6.7E+01	ND	ND	ND	ND	4.0E+00
Eu-155		1.8E + 08		ND	ND	ND	ND	8.8E+00	5.6E+00	ND	ND	ND	ND
H-3		5.0E + 07											
I-129		3.1E + 03											
K-40		2.4E + 05		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Kr-85		NA											
Np-237		6.4E + 05						ND	ND	ND	ND	ND	ND
Pm-147		3.8E + 08											
Pu-238		1.0E + 07	6.7E+02					ND	ND	ND	ND	ND	ND
Pu-239		6.7E + 06	2.5E+02					ND	ND	ND	ND	ND	9.2E+00
Pu-240		1.5E + 06	2.5E+02										
Pu-241		6.4E + 07	5.6E+04										
Ra-226		4.7E + 05											
Ru-106		1.2E + 04											
Sb-125		9.3E + 06											
Sm-151		3.4E + 08											
Sr-90		3.5E + 12	2.2E+02	5.9E+01	1.2E+01		1.1E+01	7.2E+01	5.7E+01	1.7E+03 J	4.1E+01	9.0E+01	6.5E+02

Table A-1. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 01 - 1 (pCi/g) Sample Depth (ft) 0 - 0.5	CPP 01 - 1 (pCi/g) Sample Depth (ft) 2 - 4	CPP 01 - 1 (pCi/g) Sample Depth (ft) 6 - 8	CPP 01 - 2 (pCi/g) Sample Depth (ft) 0 - 0.5	CPP 01 - 2 (pCi/g) Sample Depth (ft) 0.5 - 2	CPP 01 - 2 (pCi/g) Sample Depth (ft) 0.5 - 2[z]	CPP 01 - 2 (pCi/g) Sample Depth (ft) 8 - 10	CPP 01 - 3 (pCi/g) Sample Depth (ft) 0 - 0.5	CPP 01 - 3 (pCi/g) Sample Depth (ft) 2 - 4	CPP 01 - 3 (pCi/g) Sample Depth (ft) 8 - 10
Tc-99		5.8E + 06											
Te-125m		2.3E + 06											
Th-228		1.6E + 04											
Th-230		1.4E + 04											
Th-232		1.7E + 04											
U-233		1.6E + 08											
U-234		6.0E + 06						ND	ND	ND		ND	ND	ND
U-235		1.1E + 05						2.5E-02	2.8E-02	2.2E-02		1.5E-02	9.3E-03	2.0E-02
U-236		2.0E + 05											
U-238		2.0E + 06						2.5E-01	2.4E-01	1.9E-01		2.5E-01	1.1E-01	1.8E-01
Y-90		2.3E + 10											

NOTES: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
z. Duplicate sample result

ND - Not Detected (concentration reported was below the detection limit)
NA - Not Applicable

B - Sample result is greater than the instrument detection limit, but less than the contract required detection limit.
J - The sample concentration reported is an estimated value as a result of data validation.

Table A-2. CPP - 04/05 - contaminated soil area around CPP-633 settling tanks and settling basin.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 1 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 2 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 3 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 4 (pCi/g) Sample Depth (ft) TOP	1	2	3
Organics				NOT Analyzed															
Inorganics				NOT Analyzed															
Radionuclides																			
Ag-108m		8.0E + 05																	
Am-241		1.0E + 04	2.9E+02																
Am-243		3.3E + 02																	
Ba-137m		NA																	
C-14		3.0E + 03																	
Cd-113m		1.6E + 06																	
Ce-144		1.8E + 03		1.3E+01	1.9E+00	2.6E+02	1.8E+00	3.2E+00	1.0E+01	ND	6.6E+01	1.6E+02	1.5E+02	9.6E+00	7.4E-01	5.9E+00	2.9E+01	ND	8.7E-01
Co-57		3.7E + 03																	
Co-60		1.9E + 08		2.0E+00	3.1E-01	7.0E+01	5.5E-01	5.5E-01	3.6E+00	2.9E-02	2.5E+01	5.0E+01	4.5E+01	2.6E+00	2.2E-01	2.4E+00	1.0E+01	ND	ND
Cs-134		1.1E + 07		4.3E-01	3.0E-01	1.8E+01	ND	ND	1.1E+00	ND	4.1E+00	3.3E+01	8.7E+00	ND	ND	7.0E-01	2.1E+00	ND	ND
Cs-137		2.3E + 12	2.3E+01	5.9E+01	2.5E+01	1.6E+03	8.6E+00	3.4E+01	1.3E+02	9.7E-01	1.3E+03	3.1E+03	8.0E+02	3.7E+01	2.9E+00	9.2E+01	2.7E+02	8.8E-01	5.9E+00
Eu-152		9.7E + 08	2.7E+02	4.9E+01	1.4E+01	2.3E+03	9.6E+00	1.5E+01	8.3E+01	7.1E-01	5.9E+02	1.6E+03	1.5E+03	7.4E+01	6.0E+00	5.8E+01	2.4E+02	5.5E-01	3.3E+00
Eu-154		8.2E + 08	5.2E+03	4.9E+01	1.1E+01	2.0E+03	9.1E+00	1.4E+01	8.2E+01	5.9E-01	5.4E+02	1.4E+03	1.3E+03	7.1E+01	6.0E+00	5.8E+01	2.2E+02	6.1E-01	2.7E+00
Eu-155		1.8E + 08		1.1E+01	ND	5.8E+02	2.6E+00	3.5E+00	1.8E+01	2.9E-01	1.2E+02	3.9E+02	3.7E+02	2.0E+01	1.5E+00	1.3E+01	5.7E+01	ND	1.0E+00
H-3		5.0E + 07																	
I-129		3.1E + 03																	
K-40		2.4E + 05																	
Kr-85		NA																	
Np-237		6.4E + 05																	
Pm-147		3.8E + 08																	
Pu-238		1.0E + 07	6.7E+02																
Pu-239		6.7E + 06	2.5E+02																
Pu-240		1.5E + 06	2.5E+02																
Pu-241		6.4E + 07	5.6E+04																
Ra-226		4.7E + 05																	
Ru-106		1.2E + 04																	
Sb-125		9.3E + 06																	
Sm-151		3.4E + 08																	
Sr-90		3.5E + 12	2.2E+02																
Tc-99		5.8E + 06																	
Te-125m		2.3E + 06																	
Th-228		1.6E + 04																	
Th-230		1.4E + 04																	
Th-232		1.7E + 04																	
U-233		1.6E + 08																	

Table A-2. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 1 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 2 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 3 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 4 (pCi/g) Sample Depth (ft) TOP	1	2	3
U-234		6.0E + 06																	
U-235		1.1E + 05																	
U-236		2.0E + 05																	
U-238		2.0E + 06																	
Y-90		2.3E + 10																	

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

Table A-3. CPP - 04/05 - contaminated soil area around CPP-633 settling tanks and settling basin.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 5 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 6 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 7 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 8 (pCi/g) Sample Depth (ft) TOP	1	2	3
Organics				NOT Analyzed															
Inorganics				NOT Analyzed															
Radionuclides																			
Ag-108m		8.0E + 05																	
Am-241		1.0E + 04	2.9E+02																
Am-243		3.3E + 02																	
Ba-137m		NA																	
C-14		3.0E + 03																	
Cd-113m		1.6E + 06																	
Ce-144		1.8E + 03		ND	2.1E+00	7.1E-01	ND	8.5E+00	2.1E+02	ND	ND	3.0E+01	2.2E+00	5.7E-01	2.4E+00	9.2E+00	2.1E+02	4.1E-01	ND
Co-57		3.7E + 03																	
Co-60		1.9E + 08		1.0E+00	5.8E-01	1.1E-01	2.1E-02	4.0E+00	6.8E+01	1.2E-02	1.1E-02	2.4E+02	5.2E-01	2.5E+00	7.7E-01	4.1E+00	7.3E+01	3.6E-01	ND
Cs-134		1.1E + 07		ND	1.1E-01	ND	ND	ND	1.2E+01	ND	ND	ND	ND	ND	ND	8.8E-01	1.5E+01	ND	ND
Cs-137		2.3E + 12	2.3E+01	3.5E+01	5.2E+01	5.4E+00	2.5E+00	8.8E+01	1.4E+03	2.0E+00	3.1E+00	7.9E+03	2.3E+01	8.8E+00	6.6E+00	1.3E+02	1.4E+03	2.6E+00	3.1E+00
Eu-152		9.7E + 08	2.7E+02	1.7E+01	9.8E+00	2.4E+00	1.3E+00	7.9E+01	2.2E+03	7.7E-01	3.0E+00	7.2E+03	1.6E+01	5.3E+00	1.3E+01	9.4E+01	2.3E+03	3.1E+00	9.2E-01
Eu-154		8.2E + 08	5.2E+03	1.6E+01	8.6E+00	2.6E+00	1.3E+00	7.8E+01	2.0E+03	9.5E-01	2.9E+00	7.3E+03	1.5E+01	5.0E+00	1.3E+01	9.2E+01	2.1E+03	2.6E+00	9.7E-01
Eu-155		1.8E + 08		4.3E+00	2.9E+00	6.4E-01	4.0E-01	1.6E+01	4.9E+02	4.0E-01	7.1E-01	1.4E+03	3.1E+00	1.3E+00	2.9E+00	2.0E+01	5.3E+02	8.3E-01	1.5E-01
H-3		5.0E + 07																	
I-129		3.1E + 03																	
K-40		2.4E + 05																	
Kr-85		NA																	
Np-237		6.4E + 05																	
Pm-147		3.8E + 08																	
Pu-238		1.0E + 07	6.7E+02																
Pu-239		6.7E + 06	2.5E+02																
Pu-240		1.5E + 06	2.5E+02																
Pu-241		6.4E + 07	5.6E+04																
Ra-226		4.7E + 05																	
Ru-106		1.2E + 04																	
Sb-125		9.3E + 06																	
Sm-151		3.4E + 08																	
Sr-90		3.5E + 12	2.2E+02																
Tc-99		5.8E + 06																	
Te-125m		2.3E + 06																	
Th-228		1.6E + 04																	
Th-230		1.4E + 04																	
Th-232		1.7E + 04																	
U-233		1.6E + 08																	

Table A-3. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 5 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 6 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 7 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 8 (pCi/g) Sample Depth (ft) TOP	1	2	3
U-234		6.0E + 06																	
U-235		1.1E + 05																	
U-236		2.0E + 05																	
U-238		2.0E + 06																	
Y-90		2.3E + 10																	

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

Table A-4. CPP - 04/05 - contaminated soil area around CPP-633 settling tanks and settling basin.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 9 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 10 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 11 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 12 (pCi/g) Sample Depth (ft) TOP	1	2	3
Organics				NOT Analyzed															
Inorganics				NOT Analyzed															
Radionuclides																			
Ag-108m		8.0E + 05																	
Am-241		1.0E + 04	2.9E+02																
Am-243		3.3E + 02																	
Ba-137m		NA																	
C-14		3.0E + 03																	
Cd-113m		1.6E + 06																	
Ce-144		1.8E + 03		6.1E+00	5.1E+01	ND	2.5E-01	9.1E-01	ND	ND	ND	5.1E+01	2.0E+01	5.5E-01	ND	3.3E+02	5.2E+00	5.3E+00	4.2E-01
Co-57		3.7E + 03																	
Co-60		1.9E + 08		2.0E+00	2.4E+01	ND	ND	9.1E-02	2.0E+00	ND	ND	1.8E+01	9.8E+00	ND	ND	1.0E+02	2.2E+00	1.3E+00	ND
Cs-134		1.1E + 07		5.0E-01	4.0E+00	ND	ND	ND	6.3E-01	ND	ND	2.8E+00	1.9E+00	ND	ND	3.5E+01	ND	ND	ND
Cs-137		2.3E + 12	2.3E+01	7.0E+01	4.4E+02	4.9E-01	8.8E-01	1.6E+00	9.6E+01	4.8E-01	4.1E-01	3.0E+02	2.0E+02	3.2E+00	1.8E+00	3.4E+03	6.7E+01	1.5E+01	3.2E+00
Eu-152		9.7E + 08	2.7E+02	5.4E+01	5.2E+02	5.8E-01	7.2E-01	1.9E+00	2.9E+01	2.9E-01	ND	5.1E+02	2.1E+02	2.6E+00	5.4E-01	3.3E+03	4.5E+01	4.6E+01	1.5E+00
Eu-154		8.2E + 08	5.2E+03	5.3E+01	5.2E+02	9.0E-01	5.4E-01	1.3E+00	2.8E+01	ND	ND	4.9E+02	2.1E+02	2.8E+00	ND	3.1E+03	4.5E+01	4.4E+01	1.4E+00
Eu-155		1.8E + 08		1.2E+01	1.1E+02	ND	2.1E-01	ND	6.0E+00	2.2E-01	ND	1.2E+02	4.5E+01	8.7E-01	4.8E-01	7.5E+02	9.9E+00	1.1E+01	6.0E-01
H-3		5.0E + 07																	
I-129		3.1E + 03																	
K-40		2.4E + 05																	
Kr-85		NA																	
Np-237		6.4E + 05																	
Pm-147		3.8E + 08																	
Pu-238		1.0E + 07	6.7E+02																
Pu-239		6.7E + 06	2.5E+02																
Pu-240		1.5E + 06	2.5E+02																
Pu-241		6.4E + 07	5.6E+04																
Ra-226		4.7E + 05																	
Ru-106		1.2E + 04																	
Sb-125		9.3E + 06																	
Sm-151		3.4E + 08																	
Sr-90		3.5E + 12	2.2E+02																
Tc-99		5.8E + 06																	
Te-125m		2.3E + 06																	
Th-228		1.6E + 04																	
Th-230		1.4E + 04																	
Th-232		1.7E + 04																	
U-233		1.6E + 08																	
U-234		6.0E + 06																	
U-235		1.1E + 05																	
U-236		2.0E + 05																	

Table A-4. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 9 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 10 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 11 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 12 (pCi/g) Sample Depth (ft) TOP	1	2	3
U-238		2.0E + 06																	
Y-90		2.3E + 10																	

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

Table A-5. CPP - 04/05 - contaminated soil area around CPP-633 settling tanks and settling basin.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 13 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 14 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 15 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 16 (pCi/g) Sample Depth (ft) TOP	1	2	3
Organics				NOT Analyzed															
Inorganics				NOT Analyzed															
Radionuclides																			
Ag-108m		8.0E + 05																	
Am-241		1.0E + 04	2.9E+02																
Am-243		3.3E + 02																	
Ba-137m		NA																	
C-14		3.0E + 03																	
Cd-113m		1.6E + 06																	
Ce-144		1.8E + 03		2.4E+00	1.9E+02	2.1E+00	ND	5.0E+01	2.3E+01	ND	ND	1.1E+01	9.7E-01	1.5E+00	ND	9.9E+01	4.6E+00	2.9E+00	ND
Co-57		3.7E + 03																	
Co-60		1.9E + 08		8.6E-01	6.4E+01	1.1E+00	1.1E-01	1.0E+01	8.6E+00	ND	2.0E-02	3.7E+00	2.8E-01	1.7E+00	3.8E-02	3.0E+01	1.5E+00	2.0E-01	1.3E-01
Cs-134		1.1E + 07		2.1E-01	2.5E+01	ND	ND	1.2E+01	1.7E+00	ND	ND	1.2E+00	ND	ND	ND	1.1E+01	ND	ND	ND
Cs-137		2.3E + 12	2.3E+01	2.4E+01	2.5E+03	1.9E+01	3.1E+00	1.2E+03	1.8E+02	1.6E+00	2.5E+00	1.6E+02	1.3E+01	4.5E+01	1.6E+00	9.4E+02	5.4E+01	3.5E+00	3.6E+00
Eu-152		9.7E + 08	2.7E+02	1.5E+01	1.8E+03	2.0E+01	1.5E+00	2.4E+02	1.8E+02	1.7E+00	ND	7.9E+01	4.4E+00	1.3E+01	6.4E-01	8.5E+02	3.8E+01	3.8E+00	2.4E+00
Eu-154		8.2E + 08	5.2E+03	1.5E+01	1.7E+03	1.7E+01	1.3E+00	2.1E+02	1.7E+02	1.5E+00	ND	7.3E+01	4.8E+00	1.3E+01	ND	8.3E+02	3.7E+01	3.9E+00	2.0E+00
Eu-155		1.8E + 08		3.4E+00	4.0E+02	5.1E+00	ND	6.1E+01	4.3E+01	ND	ND	1.9E+01	1.1E+00	3.3E+00	ND	1.8E+02	8.6E+00	1.2E+00	7.2E-01
H-3		5.0E + 07																	
I-129		3.1E + 03																	
K-40		2.4E + 05																	
Kr-85		NA																	
Np-237		6.4E + 05																	
Pm-147		3.8E + 08																	
Pu-238		1.0E + 07	6.7E+02																
Pu-239		6.7E + 06	2.5E+02																
Pu-240		1.5E + 06	2.5E+02																
Pu-241		6.4E + 07	5.6E+04																
Ra-226		4.7E + 05																	
Ru-106		1.2E + 04																	
Sb-125		9.3E + 06																	
Sm-151		3.4E + 08																	
Sr-90		3.5E + 12	2.2E+02																
Tc-99		5.8E + 06																	
Te-125m		2.3E + 06																	
Th-228		1.6E + 04																	
Th-230		1.4E + 04																	
Th-232		1.7E + 04																	
U-233		1.6E + 08																	
U-234		6.0E + 06																	
U-235		1.1E + 05																	

Table A-5. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 13 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 14 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 15 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 16 (pCi/g) Sample Depth (ft) TOP	1	2	3
U-236		2.0E + 05																	
U-238		2.0E + 06																	
Y-90		2.3E + 10																	

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

Table A-6. CPP - 04/05 - contaminated soil area around CPP-633 settling tanks and settling basin.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 17 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 18 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 19 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 20 (pCi/g) Sample Depth (ft) TOP	1	2	3
Organics				NOT Analyzed															
Inorganics				NOT Analyzed															
Radionuclides																			
Ag-108m		8.0E + 05																	
Am-241		1.0E + 04	2.9E+02																
Am-243		3.3E + 02																	
Ba-137m		NA																	
C-14		3.0E + 03																	
Cd-113m		1.6E + 06																	
Ce-144		1.8E + 03		5.5E+00	1.9E+00	2.7E+00	ND	8.1E+00	3.3E+01	ND	1.9E+00	7.2E+01	ND	ND	ND	ND	8.1E-01	ND	ND
Co-57		3.7E + 03																	
Co-60		1.9E + 08		1.5E+00	4.0E-01	5.7E-01	2.0E-02	3.8E+00	1.1E+01	1.1E-01	6.7E-01	3.3E+01	4.4E-01	4.4E-02	5.8E-02	4.0E+00	3.3E-01	ND	ND
Cs-134		1.1E + 07			2.3E-01	ND	ND	1.2E+00	1.5E+00	ND	ND	7.2E+00	ND	ND	ND	8.5E-01	ND	ND	ND
Cs-137		2.3E + 12	2.3E+01	4.6E+01	2.6E+01	1.4E+01	3.1E+00	1.6E+02	1.4E+02	4.6E+00	1.7E+01	8.1E+02	8.1E+00	7.4E+00	3.9E+00	1.1E+02	1.4E+01	1.2E+00	2.2E-01
Eu-152		9.7E + 08	2.7E+02	4.3E+01	9.5E+00	8.2E+00	2.1E+00	5.8E+01	2.3E+02	2.0E+00	1.4E+01	7.1E+02	7.0E+00	4.2E-01	7.0E-01	9.6E+01	6.5E+00	9.7E-01	3.2E-01
Eu-154		8.2E + 08	5.2E+03	4.1E+01	9.9E+00	8.4E+00	2.3E+00	6.8E+01	2.4E+02	2.0E+00	1.4E+01	7.1E+02	6.4E+00	ND	1.0E+00	9.4E+01	6.5E+00	ND	ND
Eu-155		1.8E + 08		1.1E+01	2.1E+00	2.2E+00	5.9E-01	9.5E+00	4.8E+01	4.8E-01	3.2E+00	1.5E+02	2.1E+00	ND	5.4E-02	ND	1.8E+00	ND	ND
H-3		5.0E + 07																	
I-129		3.1E + 03																	
K-40		2.4E + 05																	
Kr-85		NA																	
Np-237		6.4E + 05																	
Pm-147		3.8E + 08																	
Pu-238		1.0E + 07	6.7E+02																
Pu-239		6.7E + 06	2.5E+02																
Pu-240		1.5E + 06	2.5E+02																
Pu-241		6.4E + 07	5.6E+04																
Ra-226		4.7E + 05																	
Ru-106		1.2E + 04																	
Sb-125		9.3E + 06																	
Sm-151		3.4E + 08																	
Sr-90		3.5E + 12	2.2E+02																
Tc-99		5.8E + 06																	
Te-125m		2.3E + 06																	
Th-228		1.6E + 04																	
Th-230		1.4E + 04																	
Th-232		1.7E + 04																	
U-233		1.6E + 08																	

Table A-6. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 17 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 18 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 19 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 20 (pCi/g) Sample Depth (ft) TOP	1	2	3
U-234		6.0E + 06																	
U-235		1.1E + 05																	
U-236		2.0E + 05																	
U-238		2.0E + 06																	
Y-90		2.3E + 10																	

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

Table A-7. CPP - 04/05 - contaminated soil area around CPP-633 settling tanks and settling basin.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 21 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 22 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 23 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 24 (pCi/g) Sample Depth (ft) TOP	1	2	3
Organics				NOT Analyzed															
Inorganics				NOT Analyzed															
Radionuclides																			
Ag-108m		8.0E + 05																	
Am-241		1.0E + 04	2.9E+02																
Am-243		3.3E + 02																	
Ba-137m		NA																	
C-14		3.0E + 03																	
Cd-113m		1.6E + 06																	
Ce-144		1.8E + 03		2.0E+01	5.2E+02	4.6E+00	ND	ND	7.0E+01	ND	1.6E+01	1.4E+02	1.6E+02	6.1E-01	3.4E+00	4.2E+00	1.4E+02	8.8E+00	3.5E+01
Co-57		3.7E + 03																	
Co-60		1.9E + 08		8.3E+00	1.8E+02	9.9E-01	3.0E-02	2.3E-01	3.4E+01	ND	2.3E+00	5.8E+01	6.5E+01	4.6E-01	1.1E+00	1.9E+00	6.4E+01	4.3E+00	1.3E+01
Cs-134		1.1E + 07		2.6E+00	5.8E+01	1.6E-01	ND	ND	4.9E+00	ND	3.1E-01	1.4E+01	9.2E+00	ND	ND	7.1E-01	1.3E+01	1.4E+00	1.9E+00
Cs-137		2.3E + 12	2.3E+01	2.5E+02	6.2E+03	1.2E+01	2.2E+00	5.7E+00	5.6E+02	5.3E-01	5.6E+01	1.5E+03	1.1E+03	3.0E+00	7.6E+00	7.0E+01	1.2E+03	1.4E+02	2.3E+02
Eu-152		9.7E + 08	2.7E+02	2.1E+02	5.2E+03	1.7E+01	1.6E+00	1.8E+00	7.1E+02	2.8E-01	5.6E+01	1.7E+03	1.3E+03	2.6E+00	1.7E+01	3.7E+01	1.5E+03	9.7E+01	2.9E+02
Eu-154		8.2E + 08	5.2E+03	2.2E+02	4.9E+03	1.6E+01	2.1E+00	1.7E+00	7.3E+02	ND	5.3E+01	1.4E+03	1.4E+03	3.2E+00	1.6E+01	3.9E+01	1.5E+03	9.7E+01	2.7E+02
Eu-155		1.8E + 08		4.4E+01	1.2E+03	4.4E+00	6.4E-01	6.3E-01	1.5E+02	ND	1.2E+01	3.4E+02	2.9E+02	6.9E-01	3.6E+00	7.3E+00	3.4E+02	1.8E+01	7.6E+01
H-3		5.0E + 07																	
I-129		3.1E + 03																	
K-40		2.4E + 05																	
Kr-85		NA																	
Np-237		6.4E + 05																	
Pm-147		3.8E + 08																	
Pu-238		1.0E + 07	6.7E+02																
Pu-239		6.7E + 06	2.5E+02																
Pu-240		1.5E + 06	2.5E+02																
Pu-241		6.4E + 07	5.6E+04																
Ra-226		4.7E + 05																	
Ru-106		1.2E + 04																	
Sb-125		9.3E + 06																	
Sm-151		3.4E + 08																	
Sr-90		3.5E + 12	2.2E+02																
Tc-99		5.8E + 06																	
Te-125m		2.3E + 06																	
Th-228		1.6E + 04																	
Th-230		1.4E + 04																	
Th-232		1.7E + 04																	
U-233		1.6E + 08																	

Table A-7. (continued).

	Selected ICDF WAC Concentration Guideline[a]		Remediation Goals (RGs) from ROD[b]	CPP 04/05 - 21 (pCi/g) Sample Depth (ft)				CPP 04/05 - 22 (pCi/g) Sample Depth (ft)				CPP 04/05 - 23 (pCi/g) Sample Depth (ft)				CPP 04/05 - 24 (pCi/g) Sample Depth (ft)			
Constituent[a]	(mg/kg)	(pCi/g)	(mg/kg or pCi/g)	TOP	1	2	3	TOP	1	2	3	TOP	1	2	3	TOP	1	2	3
U-234		6.0E + 06																	
U-235		1.1E + 05																	
U-236		2.0E + 05																	
U-238		2.0E + 06																	
Y-90		2.3E + 10																	

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

Table A-8. CPP - 04/05 - contaminated soil area around CPP-633 settling tanks and settling basin.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 25 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 26 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 27 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 28 (pCi/g) Sample Depth (ft) TOP	1	2	3
Organics				NOT Analyzed															
Inorganics				NOT Analyzed															
Radionuclides																			
Ag-108m		8.0E + 05																	
Am-241		1.0E + 04	2.9E+02																
Am-243		3.3E + 02																	
Ba-137m		NA																	
C-14		3.0E + 03																	
Cd-113m		1.6E + 06																	
Ce-144		1.8E + 03		2.1E+01	ND	ND	ND	1.7E+02	5.3E+01	ND	ND	4.7E+01	2.1E+01	ND	ND	1.0E+01	2.4E+03	ND	3.1E+00
Co-57		3.7E + 03																	
Co-60		1.9E + 08		7.6E+00	1.2E-01	ND	3.4E-02	6.4E+01	1.6E+01	2.5E-01	4.3E-02	2.1E+01	7.6E+00	2.3E-01	ND	3.6E+00	1.5E+03	3.7E+00	9.7E-01
Cs-134		1.1E + 07		2.3E+00	ND	ND	7.5E-02	1.8E+01	2.9E+00	ND	ND	5.5E+00	8.2E-01	ND	ND	9.9E-01	2.3E+02	ND	1.7E-01
Cs-137		2.3E + 12	2.3E+01	2.4E+02	4.3E+00	2.2E-01	3.4E-01	1.7E+03	3.2E+02	1.5E+00	2.6E+00	4.9E+02	1.5E+02	1.7E+00	3.2E+00	1.1E+02	2.7E+04	6.6E+01	1.9E+01
Eu-152		9.7E + 08	2.7E+02	2.1E+02	2.3E+00	2.0E-01	4.1E-01	1.8E+03	4.3E+02	2.1E+00	9.6E-01	4.6E+02	1.9E+02	1.2E+00	9.9E-01	8.7E+01	3.5E+04	7.6E+01	1.7E+01
Eu-154		8.2E + 08	5.2E+03	1.9E+02	2.2E+00	ND	6.5E-01	1.8E+03	4.3E+02	2.3E+00	6.9E-01	4.7E+02	1.8E+02	1.3E+00	6.3E-01	8.1E+01	3.2E+04	7.5E+01	1.5E+01
Eu-155		1.8E + 08		4.8E+01	6.6E-01	ND	ND	3.8E+02	1.1E+02	5.4E-01	2.9E-01	9.1E+01	4.3E+01	4.4E-01	3.3E-01	1.7E+01	7.6E+03	1.8E+01	3.9E+00
H-3		5.0E + 07																	
I-129		3.1E + 03																	
K-40		2.4E + 05																	
Kr-85		NA																	
Np-237		6.4E + 05																	
Pm-147		3.8E + 08																	
Pu-238		1.0E + 07	6.7E+02																
Pu-239		6.7E + 06	2.5E+02																
Pu-240		1.5E + 06	2.5E+02																
Pu-241		6.4E + 07	5.6E+04																
Ra-226		4.7E + 05																	
Ru-106		1.2E + 04																	
Sb-125		9.3E + 06																	
Sm-151		3.4E + 08																	
Sr-90		3.5E + 12	2.2E+02																
Tc-99		5.8E + 06																	
Te-125m		2.3E + 06																	
Th-228		1.6E + 04																	
Th-230		1.4E + 04																	
Th-232		1.7E + 04																	

Table A-8. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 25 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 26 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 27 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 28 (pCi/g) Sample Depth (ft) TOP	1	2	3
U-233		1.6E + 08																	
U-234		6.0E + 06																	
U-235		1.1E + 05																	
U-236		2.0E + 05																	
U-238		2.0E + 06																	
Y-90		2.3E + 10																	

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

Table A-9. CPP - 04/05 - contaminated soil area around CPP-633 settling tanks and settling basin.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 29 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 30 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 31 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 32 (pCi/g) Sample Depth (ft) TOP	1	2	3
Organics				NOT Analyzed															
Inorganics				NOT Analyzed															
Radionuclides																			
Ag-108m		8.0E + 05																	
Am-241		1.0E + 04	2.9E+02																
Am-243		3.3E + 02																	
Ba-137m		NA																	
C-14		3.0E + 03																	
Cd-113m		1.6E + 06																	
Ce-144		1.8E + 03		4.3E+01	1.5E+01	ND	ND	1.7E+00	6.8E+00	1.1E+01	ND	2.2E+00	1.9E+02	1.3E+00	ND	6.8E+01	ND	ND	ND
Co-57		3.7E + 03																	
Co-60		1.9E + 08		1.5E+01	6.2E+00	2.1E+00	1.3E-01	6.4E-01	4.5E+00	3.9E+00	ND	4.3E-01	7.6E+01	6.4E-01	ND	3.3E+01	1.9E-01	ND	ND
Cs-134		1.1E + 07		6.2E+00	1.6E+00	ND	ND	ND	ND	ND	ND	ND	1.8E+01	ND	ND	5.1E+00	ND	ND	ND
Cs-137		2.3E + 12	2.3E+01	5.8E+02	1.8E+02	1.8E+01	7.0E+00	3.8E+01	3.8E+01	2.27E+01	4.4E-01	2.26E+01	1.5E+03	9.5E+00	7.1E+00	7.6E+02	5.6E+00	6.0E+00	3.5E+00
Eu-152		9.7E + 08	2.7E+02	4.3E+02	1.4E+02	1.8E+01	2.4E+00	1.6E+01	5.6E+01	1.0E+02	6.0E-01	1.5E+01	2.1E+03	1.1E+01	2.2E+00	6.4E+02	1.0E+00	ND	4.8E-01
Eu-154		8.2E + 08	5.2E+03	3.9E+02	1.5E+02	1.8E+01	1.4E+00	1.6E+01	5.5E+01	9.0E+01	5.3E-01	1.6E+01	2.1E+03	1.1E+01	2.2E+00	6.4E+02	2.1E+00	ND	ND
Eu-155		1.8E + 08		9.7E+01	3.5E+01	4.1E+00	ND	3.0E+00	1.4E+01	1.1E+01	4.0E-01	3.3E+00	4.5E+02	2.5E+00	ND	1.5E+02	3.1E-01	1.5E-01	5.6E-01
H-3		5.0E + 07																	
I-129		3.1E + 03																	
K-40		2.4E + 05																	
Kr-85		NA																	
Np-237		6.4E + 05																	
Pm-147		3.8E + 08																	
Pu-238		1.0E + 07	6.7E+02																
Pu-239		6.7E + 06	2.5E+02																
Pu-240		1.5E + 06	2.5E+02																
Pu-241		6.4E + 07	5.6E+04																
Ra-226		4.7E + 05																	
Ru-106		1.2E + 04																	
Sb-125		9.3E + 06																	
Sm-151		3.4E + 08																	
Sr-90		3.5E + 12	2.2E+02																
Tc-99		5.8E + 06																	
Te-125m		2.3E + 06																	
Th-228		1.6E + 04																	
Th-230		1.4E + 04																	
Th-232		1.7E + 04																	
U-233		1.6E + 08																	

Table A-9. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 29 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 30 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 31 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 32 (pCi/g) Sample Depth (ft) TOP	1	2	3
U-234		6.0E + 06																	
U-235		1.1E + 05																	
U-236		2.0E + 05																	
U-238		2.0E + 06																	
Y-90		2.3E + 10																	

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

Table A-10. CPP - 04/05 - contaminated soil area around CPP-633 settling tanks and settling basin.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 33 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 34 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 35 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 36 (pCi/g) Sample Depth (ft) TOP	1	2	3
Organics				NOT Analyzed															
Inorganics				NOT Analyzed															
Radionuclides																			
Ag-108m		8.0E + 05																	
Am-241		1.0E + 04	2.9E+02																
Am-243		3.3E + 02																	
Ba-137m		NA																	
C-14		3.0E + 03																	
Cd-113m		1.6E + 06																	
Ce-144		1.8E + 03		5.8E+00	9.1E+00	ND	ND	9.9E+00	2.9E+02	1.2E+00	ND	ND	ND	ND	ND	9.5E-01	3.0E+02	ND	1.4E+00
Co-57		3.7E + 03																	
Co-60		1.9E + 08		3.1E+00	6.0E+00	1.0E-01	ND	4.3E+00	1.4E+02	7.6E-01	4.1E-01	2.7E+00	7.4E-02	3.6E-02	ND	1.5E-01	1.2E+02	ND	1.1E+00
Cs-134		1.1E + 07		6.4E-01	9.2E-01	ND	ND	9.5E-01	6.2E+01	ND	ND	5.3E-01	ND	ND	ND	ND	2.0E+01	ND	ND
Cs-137		2.3E + 12	2.3E+01	9.0E+01	3.3E+02	5.1E+00	3.4E+00	1.3E+02	7.5E+03	2.6E+01	6.9E+00	1.5E+02	5.1E+00	2.9E+00	1.0E+00	1.4E+01	2.9E+03	5.6E+00	1.8E+01
Eu-152		9.7E + 08	2.7E+02	6.0E+01	1.1E+02	7.9E-01	3.1E-01	1.1E+02	3.1E+03	9.2E+00	3.9E+00	4.0E+01	1.5E+00	1.2E+00	ND	2.8E+00	3.3E+03	1.1E+00	1.7E+01
Eu-154		8.2E + 08	5.2E+03	5.9E+01	9.4E+01	8.7E-01	ND	1.1E+02	3.1E+03	8.9E+00	3.5E+00	3.9E+01	1.3E+00	9.3E-01	ND	2.7E+00	3.1E+03	5.9E-01	1.5E+01
Eu-155		1.8E + 08		1.3E+01	2.6E+01	2.2E-01	ND	2.4E+01	6.5E+02	2.3E+00	1.1E+00	9.4E+00	1.2E+00	ND	ND	7.3E-01	7.0E+02	3.0E-01	3.9E+00
H-3		5.0E + 07																	
I-129		3.1E + 03																	
K-40		2.4E + 05																	
Kr-85		NA																	
Np-237		6.4E + 05																	
Pm-147		3.8E + 08																	
Pu-238		1.0E + 07	6.7E+02																
Pu-239		6.7E + 06	2.5E+02																
Pu-240		1.5E + 06	2.5E+02																
Pu-241		6.4E + 07	5.6E+04																
Ra-226		4.7E + 05																	
Ru-106		1.2E + 04																	
Sb-125		9.3E + 06																	
Sm-151		3.4E + 08																	
Sr-90		3.5E + 12	2.2E+02																
Tc-99		5.8E + 06																	
Te-125m		2.3E + 06																	
Th-228		1.6E + 04																	
Th-230		1.4E + 04																	
Th-232		1.7E + 04																	
U-233		1.6E + 08																	

Table A-10. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 33 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 34 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 35 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 36 (pCi/g) Sample Depth (ft) TOP	1	2	3
U-234		6.0E + 06																	
U-235		1.1E + 05																	
U-236		2.0E + 05																	
U-238		2.0E + 06																	
Y-90		2.3E + 10																	

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

Table A-11. CPP - 04/05 - contaminated soil area around CPP-633 settling tanks and settling basin.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 37 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 38 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 39 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 40 (pCi/g) Sample Depth (ft) TOP	1	2	3
Organics				NOT Analyzed															
Inorganics				NOT Analyzed															
Radionuclides																			
Ag-108m		8.0E + 05																	
Am-241		1.0E + 04	2.9E+02																
Am-243		3.3E + 02																	
Ba-137m		NA																	
C-14		3.0E + 03																	
Cd-113m		1.6E + 06																	
Ce-144		1.8E + 03		ND	ND	2.7E+02	5.8E+01	ND	ND	4.0E+00	4.8E+00	1.4E+03	1.7E+02	1.9E+01	4.0E+00	2.7E+00	1.7E+03	9.7E+00	1.7E+01
Co-57		3.7E + 03																	
Co-60		1.9E + 08		3.6E-01	1.8E-02	1.3E+02	2.8E+01	2.7E-01	ND	2.3E+00	2.5E+00	4.9E+02	8.1E+01	5.9E+00	1.6E+00	1.3E+00	8.8E+02	4.4E+00	3.5E+00
Cs-134		1.1E + 07		ND	ND	2.2E+01	4.1E+00	ND	ND	6.1E-01	1.9E-01	6.1E+01	1.3E+01	ND	4.0E-01	ND	1.2E+02	3.6E-01	ND
Cs-137		2.3E + 12	2.3E+01	5.0E+00	2.2E+00	3.2E+03	6.9E+02	5.3E+00	6.0E+00	6.9E+01	3.8E+02	1.6E+04	3.8E+03	9.2E+01	1.2E+03	4.4E+01	1.3E+04	3.4E+02	5.8E+01
Eu-152		9.7E + 08	2.7E+02	3.0E+00	6.2E-01	3.0E+03	6.3E+02	1.9E+00	9.1E-01	4.9E+01	2.9E+01	1.4E+04	1.7E+03	1.0E+02	1.8E+01	2.7E+01	2.0E+04	6.0E+01	8.8E+01
Eu-154		8.2E + 08	5.2E+03	2.8E+00	7.7E-01	2.8E+03	5.8E+02	2.5E+00	1.0E+00	5.1E+01	2.8E+01	1.2E+04	1.6E+03	9.5E+01	1.5E+01	2.6E+01	1.9E+04	5.9E+01	8.6E+01
Eu-155		1.8E + 08		7.8E-01	1.5E+00	6.3E+02	1.4E+02	5.8E-01	4.0E-01	9.4E+00	5.6E+00	3.0E+03	3.6E+02	2.2E+01	4.7E+00	6.2E+00	4.3E+03	1.4E+01	2.2E+01
H-3		5.0E + 07																	
I-129		3.1E + 03																	
K-40		2.4E + 05																	
Kr-85		NA																	
Np-237		6.4E + 05																	
Pm-147		3.8E + 08																	
Pu-238		1.0E + 07	6.7E+02																
Pu-239		6.7E + 06	2.5E+02																
Pu-240		1.5E + 06	2.5E+02																
Pu-241		6.4E + 07	5.6E+04																
Ra-226		4.7E + 05																	
Ru-106		1.2E + 04																	
Sb-125		9.3E + 06																	
Sm-151		3.4E + 08																	
Sr-90		3.5E + 12	2.2E+02																
Tc-99		5.8E + 06																	
Te-125m		2.3E + 06																	
Th-228		1.6E + 04																	
Th-230		1.4E + 04																	
Th-232		1.7E + 04																	
U-233		1.6E + 08																	

Table A-11. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 37 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 38 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 39 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 40 (pCi/g) Sample Depth (ft) TOP	1	2	3
U-234		6.0E + 06																	
U-235		1.1E + 05																	
U-236		2.0E + 05																	
U-238		2.0E + 06																	
Y-90		2.3E + 10																	

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

Table A-12. CPP - 04/05 - contaminated soil area around CPP-633 settling tanks and settling basin.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 41 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 42 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 43 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 44 (pCi/g) Sample Depth (ft) TOP	1	2	3
Organics				NOT Analyzed															
Inorganics				NOT Analyzed															
Radionuclides																			
Ag-108m		8.0E + 05																	
Am-241		1.0E + 04	2.9E+02																
Am-243		3.3E + 02																	
Ba-137m		NA																	
C-14		3.0E + 03																	
Cd-113m		1.6E + 06																	
Ce-144		1.8E + 03		9.8E-01	3.7E+02	ND	1.3E+01	1.2E+03	3.5E+00	ND	1.6E+00	2.9E+01	4.4E+01	ND	ND	1.1E+03	2.3E+01	2.2E+00	ND
Co-57		3.7E + 03																	
Co-60		1.9E + 08		3.2E-01	2.2E+02	1.0E-01	6.0E+00	6.2E+02	1.4E+00	ND	1.8E-01	1.3E+01	1.4E+01	2.2E-01	ND	5.8E+02	8.8E+00	1.4E+00	3.3E-01
Cs-134		1.1E + 07		2.5E-01	3.6E+01	ND	8.3E-01	1.3E+02	ND	4.1E-01	ND	4.8E+00	3.4E+00	ND	ND	1.5E+02	ND	ND	ND
Cs-137		2.3E + 12	2.3E+01	3.4E+01	4.0E+03	1.0E+01	8.8E+01	1.5E+04	2.8E+01	9.2E+00	6.4E+00	4.9E+02	5.4E+02	3.3E+00	3.0E+00	2.4E+04	3.6E+02	3.5E+01	1.3E+01
Eu-152		9.7E + 08	2.7E+02	8.1E+00	4.9E+03	3.6E+00	1.4E+02	1.6E+04	3.2E+01	3.1E+00	6.1E+00	3.0E+02	3.6E+02	2.8E+00	1.2E+00	1.2E+04	1.3E+02	2.3E+01	5.5E+00
Eu-154		8.2E + 08	5.2E+03	7.9E+00	5.0E+03	3.0E+00	1.3E+02	1.4E+04	3.1E+01	3.1E+00	5.4E+00	3.4E+02	3.3E+02	2.6E+00	1.5E+00	1.1E+04	1.3E+02	2.1E+01	5.5E+00
Eu-155		1.8E + 08		2.3E+00	9.0E+02	8.6E-01	2.9E+01	3.5E+03	7.6E+00	1.1E+00	1.8E+00	5.7E+01	9.0E+01	ND	3.5E-01	2.6E+03	3.1E+01	5.4E+00	1.7E+00
H-3		5.0E + 07																	
I-129		3.1E + 03																	
K-40		2.4E + 05																	
Kr-85		NA																	
Np-237		6.4E + 05																	
Pm-147		3.8E + 08																	
Pu-238		1.0E + 07	6.7E+02																
Pu-239		6.7E + 06	2.5E+02																
Pu-240		1.5E + 06	2.5E+02																
Pu-241		6.4E + 07	5.6E+04																
Ra-226		4.7E + 05																	
Ru-106		1.2E + 04																	
Sb-125		9.3E + 06																	
Sm-151		3.4E + 08																	
Sr-90		3.5E + 12	2.2E+02																
Tc-99		5.8E + 06																	
Te-125m		2.3E + 06																	
Th-228		1.6E + 04																	
Th-230		1.4E + 04																	
Th-232		1.7E + 04																	
U-233		1.6E + 08																	

Table A-12. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 41 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 42 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 43 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 44 (pCi/g) Sample Depth (ft) TOP	1	2	3
U-234		6.0E + 06																	
U-235		1.1E + 05																	
U-236		2.0E + 05																	
U-238		2.0E + 06																	
Y-90		2.3E + 10																	

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

Table A-13. CPP - 04/05 - contaminated soil area around CPP-633 settling tanks and settling basin.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 45 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 46 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 47 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 48 (pCi/g) Sample Depth (ft) TOP	1	2	3
Organics				NOT Analyzed															
Inorganics				NOT Analyzed															
Radionuclides																			
Ag-108m		8.0E + 05																	
Am-241		1.0E + 04	2.9E+02																
Am-243		3.3E + 02																	
Ba-137m		NA																	
C-14		3.0E + 03																	
Cd-113m		1.6E + 06																	
Ce-144		1.8E + 03		5.4E+02	1.0E+03	3.0E+00	5.5E+01	ND	7.8E+01	1.0E+00	ND	1.3E+02	4.6E+01	1.2E+00	ND	ND	5.7E+01	ND	2.0E-01
Co-57		3.7E + 03																	
Co-60		1.9E + 08		3.4E+02	3.6E+02	7.0E-01	1.4E+01	ND	2.3E+01	2.2E-01	ND	4.3E+01	1.4E+01	3.9E-01	3.2E-01	2.7E-01	2.5E+01	ND	1.1E-01
Cs-134		1.1E + 07		4.4E+01	4.0E+01	ND	ND	ND	3.9E+00	ND	ND	1.8E+01	3.0E+00	ND	ND	5.1E+00	ND	ND	ND
Cs-137		2.3E + 12	2.3E+01	6.6E+03	7.2E+03	6.8E+00	2.1E+02	1.3E+01	4.9E+02	6.1E+00	3.4E+00	1.7E+03	4.1E+02	1.3E+01	9.0E+00	8.7E+00	5.8E+02	7.7E+00	3.0E+00
Eu-152		9.7E + 08	2.7E+02	4.8E+03	1.2E+04	1.8E+01	4.1E+02	6.7E-01	7.8E+02	6.7E+00	3.4E-01	1.3E+03	4.0E+02	8.3E+00	3.6E+00	3.4E+00	5.2E+02	5.3E-01	1.7E+00
Eu-154		8.2E + 08	5.2E+03	4.5E+03	1.1E+04	1.7E+01	3.6E+02	ND	6.9E+02	7.0E+00	5.4E-01	1.2E+03	3.7E+02	8.0E+00	3.0E+00	3.4E+00	4.7E+02	5.8E-01	1.4E+00
Eu-155		1.8E + 08		1.0E+03	2.6E+03	4.3E+00	9.8E+01	ND	1.8E+02	1.9E+00	ND	2.7E+02	1.0E+02	1.9E+00	1.2E+00	1.1E+00	1.4E+02	1.3E-01	3.3E-01
H-3		5.0E + 07																	
I-129		3.1E + 03																	
K-40		2.4E + 05																	
Kr-85		NA																	
Np-237		6.4E + 05																	
Pm-147		3.8E + 08																	
Pu-238		1.0E + 07	6.7E+02																
Pu-239		6.7E + 06	2.5E+02																
Pu-240		1.5E + 06	2.5E+02																
Pu-241		6.4E + 07	5.6E+04																
Ra-226		4.7E + 05																	
Ru-106		1.2E + 04																	
Sb-125		9.3E + 06																	
Sm-151		3.4E + 08																	
Sr-90		3.5E + 12	2.2E+02																
Tc-99		5.8E + 06																	
Te-125m		2.3E + 06																	
Th-228		1.6E + 04																	
Th-230		1.4E + 04																	
Th-232		1.7E + 04																	
U-233		1.6E + 08																	
U-234		6.0E + 06																	

Table A-13. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 45 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 46 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 47 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 48 (pCi/g) Sample Depth (ft) TOP	1	2	3
U-235		1.1E + 05																	
U-236		2.0E + 05																	
U-238		2.0E + 06																	
Y-90		2.3E + 10																	

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

Table A-14. CPP - 04/05 - contaminated soil area around CPP-633 settling tanks and settling basin.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 49 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 50 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 51 (pCi/g) Sample Depth (ft) TOP	1	2	3
Organics				NOT Analyzed											
Inorganics				NOT Analyzed											
Radionuclides															
Ag-108m		8.0E + 05													
Am-241		1.0E + 04	2.9E+02												
Am-243		3.3E + 02													
Ba-137m		NA													
C-14		3.0E + 03													
Cd-113m		1.6E + 06													
Ce-144		1.8E + 03		ND	ND	ND	6.6E+00	5.9E+00	5.8E+02	1.2E+00	9.6E-01	5.5E+00	ND	ND	ND
Co-57		3.7E + 03													
Co-60		1.9E + 08		6.1E-01	2.6E-01	1.5E-01	1.4E+00	2.5E+01	4.7E+02	3.9E+00	1.5E+00	2.8E+00	1.1E-01	ND	ND
Cs-134		1.1E + 07		2.1E-01	ND	ND	7.1E-01	2.3E+00	6.6E+01	3.5E-01	ND	ND	ND	ND	ND
Cs-137		2.3E + 12	2.3E+01	1.8E+01	4.8E+01	6.4E+01	1.1E+02	2.9E+02	1.1E+04	6.3E+01	1.1E+01	2.9E+01	2.3E+00	1.1E+00	1.6E+00
Eu-152		9.7E + 08	2.7E+02	2.8E+00	2.9E+00	ND	1.9E+01	1.4E+01	5.2E+03	7.9E+00	6.9E+00	1.9E+01	2.0E+00	2.0E-01	3.5E-01
Eu-154		8.2E + 08	5.2E+03	2.9E+00	2.5E+00	ND	1.8E+01	1.4E+01	4.6E+03	6.9E+00	5.8E+00	1.7E+01	1.7E+00	4.7E-01	ND
Eu-155		1.8E + 08		ND	ND	ND	4.7E+00	4.0E+00	1.2E+03	1.9E+00	2.2E+00	4.4E+00	8.5E-01	2.0E-01	1.1E-01
H-3		5.0E + 07													
I-129		3.1E + 03													
K-40		2.4E + 05													
Kr-85		NA													
Np-237		6.4E + 05													
Pm-147		3.8E + 08													
Pu-238		1.0E + 07	6.7E+02												
Pu-239		6.7E + 06	2.5E+02												
Pu-240		1.5E + 06	2.5E+02												
Pu-241		6.4E + 07	5.6E+04												
Ra-226		4.7E + 05													
Ru-106		1.2E + 04													
Sb-125		9.3E + 06													
Sm-151		3.4E + 08													
Sr-90		3.5E + 12	2.2E+02												
Tc-99		5.8E + 06													
Te-125m		2.3E + 06													
Th-228		1.6E + 04													
Th-230		1.4E + 04													
Th-232		1.7E + 04													
U-233		1.6E + 08													
U-234		6.0E + 06													

Table A-14. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 04/05 - 49 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 50 (pCi/g) Sample Depth (ft) TOP	1	2	3	CPP 04/05 - 51 (pCi/g) Sample Depth (ft) TOP	1	2	3
U-235		1.1E + 05													
U-236		2.0E + 05													
U-238		2.0E + 06													
Y-90		2.3E + 10													

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

Table A-15. CPP - 08/09 - basin filter system line failure & northeast corner of CPP-603 south basin.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-08/09 – 1 (pCi/g) Sample Depth (ft) 0-0.5	2-4	6-8	8-10
Organics				NOT Analyzed			
Inorganics				NOT Analyzed			
Radionuclides							
Ag-108m		8.0E + 05					
Am-241		1.0E + 04	2.9E+02				
Am-243		3.3E + 02					
Ba-137m		NA					
C-14		3.0E + 03					
Cd-113m		1.6E + 06					
Ce-144		1.8E + 03					
Co-57		3.7E + 03					
Co-60		1.9E + 08					
Cs-134		1.1E + 07					
Cs-137		2.3E + 12	2.3E+01	4.2E+01	9.9E+02	1.1E+03	
Eu-152		9.7E + 08	2.7E+02		4.4E+00		
Eu-154		8.2E + 08	5.2E+03	7.8E-01	3.0E+00		
Eu-155		1.8E + 08					
H-3		5.0E + 07					
I-129		3.1E + 03					
K-40		2.4E + 05					
Kr-85		NA					
Np-237		6.4E + 05					
Pm-147		3.8E + 08					
Pu-238		1.0E + 07	6.7E+02				
Pu-239		6.7E + 06	2.5E+02				
Pu-240		1.5E + 06	2.5E+02				
Pu-241		6.4E + 07	5.6E+04				
Ra-226		4.7E + 05					
Ru-106		1.2E + 04					
Sb-125		9.3E + 06					
Sm-151		3.4E + 08					
Sr-90		3.5E + 12	2.2E+02	2.5E+01 J		1.4E+02	
Tc-99		5.8E + 06					
Te-125m		2.3E + 06					
Th-228		1.6E + 04					
Th-230		1.4E + 04					
Th-232		1.7E + 04					

Table A-15. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-08/09 – 1 (pCi/g) Sample Depth (ft) 0-0.5	2-4	6-8	8-10
U-233		1.6E + 08					
U-234		6.0E + 06					
U-235		1.1E + 05			2.6E-02	1.9E-02	
U-236		2.0E + 05					
U-238		2.0E + 06			1.6E-01	1.6E-01	
Y-90		2.3E + 10					

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

NA - Not Applicable

J - The sample concentration reported is an estimated value as a result of data validation.

Table A-16. CPP-10 - CPP-603 plastic pipeline break.

	Selected ICDF WAC Concentration Guideline[a]		Remediation Goals (RGs) from ROD[b]	CPP 10 - 1 (pCi/g) Sample Depth (ft)			
Constituent[a]	(mg/kg)	(pCi/g)	(mg/kg or pCi/g)	0-0.5	2-4	4-6	8-10
Organics				NOT Analyzed			
Inorganics				NOT Analyzed			
Radionuclides							
Ag-108m		8.0E + 05					
Am-241		1.0E + 04	2.9E+02				
Am-243		3.3E + 02					
Ba-137m		NA					
C-14		3.0E + 03					
Cd-113m		1.6E + 06					
Ce-144		1.8E + 03					
Co-57		3.7E + 03					
Co-60		1.9E + 08					
Cs-134		1.1E + 07					
Cs-137		2.3E + 12	2.3E+01	3.9E+02	1.2E+03	1.1E+03	
Eu-152		9.7E + 08	2.7E+02				
Eu-154		8.2E + 08	5.2E+03				
Eu-155		1.8E + 08					
H-3		5.0E + 07					
I-129		3.1E + 03					
K-40		2.4E + 05					
Kr-85		NA					
Np-237		6.4E + 05					
Pm-147		3.8E + 08					
Pu-238		1.0E + 07	6.7E+02		ND		
Pu-239		6.7E + 06	2.5E+02		ND		
Pu-240		1.5E + 06	2.5E+02				
Pu-241		6.4E + 07	5.6E+04				
Ra-226		4.7E + 05					
Ru-106		1.2E + 04					
Sb-125		9.3E + 06					
Sm-151		3.4E + 08					
Sr-90		3.5E + 12	2.2E+02				
Tc-99		5.8E + 06					
Te-125m		2.3E + 06					
Th-228		1.6E + 04					
Th-230		1.4E + 04					
Th-232		1.7E + 04					
U-233		1.6E + 08					
U-234		6.0E + 06					

Table A-16. (continued).

	Selected ICDF WAC Concentration Guideline[a]		Remediation Goals (RGs) from ROD[b]	CPP 10 - 1 (pCi/g) Sample Depth (ft)			
Constituent[a]	(mg/kg)	(pCi/g)	(mg/kg or pCi/g)	0-0.5	2-4	4-6	8-10
U-235		1.1E + 05			1.3E-02	1.4E-02	
U-236		2.0E + 05					
U-238		2.0E + 06			2.1E-01	1.8E-01	
Y-90		2.3E + 10					

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

Table A-17. CPP-11 – CPP-603 sludge and water release.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-11 – 1 (mg/kg or pCi/g) Sample Depth (ft) 0 - 0.5	0.5 - 2.5	7.5 - 10	CPP 11 – 2 (mg/kg or pCi/g) Sample Depth (ft) 0 - 0.5	0.5 - 2.5	7.5 - 10	Cpp 11 – 3 (mg/kg or pCi/g) Sample Depth (ft) 0 - 0.5	2.5 - 5	5 - 7.5
Organics				NOT Analyzed								
Inorganics												
Aluminum	1.6E + 05			6.6E+03	6.5E+03	4.1E+03	5.1E+03	4.5E+03	6.1E+03	6.6E+03	7.0E+03	7.4E+03
Antimony	5.8E + 03			4.4E-01 B	5.9E-01 B	4.5E-01 B	6.2E-01 B	4.7E-01 B	ND	4.9E-01 B	8.3E-01 B	7.8E-01 B
Arsenic	5.8E + 01			6.4E+00	5.7E+00	2.8E+00	5.3E+00	4.8E+00	6.2E+00	4.3E+00	2.9E+00	3.9E+00
Barium	3.0E + 03			1.0E+02	1.1E+02	6.3E+01	8.2E+01	7.3E+01	9.2E+01	1.1E+02	1.2E+02	1.2E+02
Beryllium	1.8E + 01			4.5E-01	4.3E-01	2.5E-01	3.9E-01	3.6E-01	4.5E-01	4.7E-01	4.7E-01	5.0E-01
Boron	3.3E + 03											
Cadmium	3.6E + 03			1.7E+00	1.6E+00	1.1E+00 B	1.5E+00	1.4E+00	1.6E+00	6.1E-01 B	7.1E-01 B	5.5E-01 B
Calcium	No Limit			1.6E+04 J	3.1E+04 J	2.3E+04 J	2.8E+04 J	1.1E+04 J	1.3E+04 J	2.0E+04	1.2E+04	1.2E+04
Chloride	3.3E + 04											
Chromium	4.1E + 04			2.0E+01 J	1.9E+01 J	1.3E+01 J	1.9E+01 J	1.4E+0 J	2.1E+01 J	1.8E+01	1.7E+01	2.1E+01
Cobalt	1.1E + 02			5.4E+00 B	5.3E+00 B	3.5E+00 B	5.0E+00 B	4.3E+00 B	5.2E+00 B	5.4E+00 B	5.9E+00 B	6.3E+00 B
Copper	3.0E + 04			1.5E+01	1.3E+01	7.8E+00	1.3E+01	1.1E+01	1.5E+01	1.4E+01	1.3E+01	1.4E+01
Cyanide	3.4E + 02											
Dysprosium	5.9E + 04											
Fluoride	3.9E + 03											
Iron	2.4E + 05			1.3E+04	1.2E+04	8.0E+03	1.1E+04	1.0E+04	1.2E+04	1.2E+04	1.3E+04	1.4E+04
Lead	5.8E + 04			7.6E+00	8.0E+00	5.3E+00	8.8E+00	6.1E+00	7.6E+00	5.9E+00	6.0E+00	7.5E+00
Magnesium	1.2E + 05			4.1E+03 J	4.1E+03 J	3.3E+03 J	4.1E+03 J	2.8E+03 J	3.9E+03 J	4.2E+03	4.2E+03	4.7E+03
Manganese	4.9E + 03			2.0E+02	1.9E+02	1.3E+02	1.6E+02	1.4E+02	1.9E+02	2.3E+02 J	2.3E+02 J	2.5E+02 J
Mercury	9.5E + 03		2.3E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND
Molybdenum	1.0E + 04											
Nickel	3.5E + 02			1.8E+01	1.8E+01	1.2E+01	1.9E+01	1.4E+01	1.7E+01	1.8E+01	1.6E+01	2.0E+01
Nitrate	3.9E + 03											
Nitrate/Nitrite-N	3.3E + 04											
Nitrite	8.5E + 00								ND			
Phosphate	3.30E+04											
Phosphorus	No Limit											
Potassium	4.3E + 04			1.3E+03 J	1.4E+03 J	7.2E+02 J	9.8E+02 J	8.6E+02 J	1.1E+03 J	1.3E+03 J	1.3E+03 J	1.4E+03 J
Selenium	8.5E + 02			ND	ND	ND	8.5 E-01B	ND	ND	ND	ND	ND
Silicon	3.30E+04											
Silver	9.8E + 03			ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	3.2E + 03			1.4E+02 B	1.5E+02 B	9.5E+01 B	1.7E+02 B	1.2E+02 B	1.2E+02 B	1.2E+02 J	1.2E+02 J	1.3E+02 J
Strontium	1.8E + 04											
Sulfate	3.3E + 04											
Sulfide	3.3E + 04											
Terbium	No Limit											
Thallium	4.3E + 00			ND	ND	1.3E+00 B	ND	ND	ND	ND	ND	ND

Table A-17. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-11 – 1 (mg/kg or pCi/g) Sample Depth (ft) 0 - 0.5	CPP-11 – 1 (mg/kg or pCi/g) Sample Depth (ft) 0.5 - 2.5	CPP-11 – 1 (mg/kg or pCi/g) Sample Depth (ft) 7.5 - 10	CPP 11 – 2 (mg/kg or pCi/g) Sample Depth (ft) 0 - 0.5	CPP 11 – 2 (mg/kg or pCi/g) Sample Depth (ft) 0.5 - 2.5	CPP 11 – 2 (mg/kg or pCi/g) Sample Depth (ft) 7.5 - 10	Cpp 11 – 3 (mg/kg or pCi/g) Sample Depth (ft) 0 - 0.5	Cpp 11 – 3 (mg/kg or pCi/g) Sample Depth (ft) 2.5 - 5	Cpp 11 – 3 (mg/kg or pCi/g) Sample Depth (ft) 5 - 7.5
Tin	3.00E+03											
Vanadium	4.5E + 02			2.8E+01	2.6E+01	1.8E+01	2.7E+01	2.1E+01	2.6E+01	2.6E+01	2.5E+01	2.8E+01
Ytterbium	No Limit											
Zinc	2.1E + 05			5.3E+01	5.4E+01	3.3E+01	4.8E+01	4.3E+01	4.8E+01	5.7E+01	5.5E+01	6.4E+01
Zirconium	No Limit											
Radionuclides												
Ag-108m		8.0E + 05										
Am-241		1.0E + 04	2.9E+02									
Am-243		3.3E + 02										
Ba-137m		NA										
C-14		3.0E + 03										
Cd-113m		1.6E + 06										
Ce-144		1.8E + 03										
Co-57		3.7E + 03										
Co-58		NA		ND	ND	ND	ND	ND	ND	ND	ND	ND
Co-60		1.9E + 08		1.6E-01	ND	6.1E-01	1.1E-01	ND	ND	ND	ND	ND
Cs-134		1.1E + 07		ND	ND	ND	ND	ND	ND			
Cs-137		2.3E + 12	2.3E+01	2.7E+01	1.7E+01	7.1E+01	2.9E+01	7.3E+01	2.2E+00	2.4E+01	1.0E+01	3.5E+00
Eu-152		9.7E + 08	2.7E+02					ND				
Eu-154		8.2E + 08	5.2E+03	1.0E+00	3.6E-01	1.8E+00	3.9E-01	5.3E-01	ND	4.4E-01	ND	ND
Eu-155		1.8E + 08		ND	ND	ND	ND	ND	ND	ND	ND	ND
H-3		5.0E + 07										
I-129		3.1E + 03										
K-40		2.4E + 05										
Kr-85		NA										
Nb-95		NA		ND	ND	ND	ND	ND	ND	ND	ND	ND
Np-237		6.4E + 05						1.5E-01				
Pm-147		3.8E + 08										
Pu-238		1.0E + 07	6.7E+02					ND				
Pu-239		6.7E + 06	2.5E+02					ND				
Pu-240		1.5E + 06	2.5E+02					ND				
Pu-241		6.4E + 07	5.6E+04									
Ra-226		4.7E + 05										
Ru-103		NA		ND	ND	ND	ND	ND	ND	ND	ND	ND
Ru-106		1.2E + 04		ND	ND	ND	ND	ND	ND	ND	ND	ND
Sb-125		9.3E + 06		ND	ND	ND	ND	ND	ND	ND	ND	ND
Sm-151		3.4E + 08										
Sr-90		3.5E + 12	2.2E+02	2.0E+01			1.3E+01 J					
Tc-99		5.8E + 06										
Te-125m		2.3E + 06										
Th-228		1.6E + 04										

Table A-17. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-11 – 1 (mg/kg or pCi/g) Sample Depth (ft) 0 - 0.5	CPP-11 – 1 (mg/kg or pCi/g) Sample Depth (ft) 0.5 - 2.5	CPP-11 – 1 (mg/kg or pCi/g) Sample Depth (ft) 7.5 - 10	CPP 11 – 2 (mg/kg or pCi/g) Sample Depth (ft) 0 - 0.5	CPP 11 – 2 (mg/kg or pCi/g) Sample Depth (ft) 0.5 - 2.5	CPP 11 – 2 (mg/kg or pCi/g) Sample Depth (ft) 7.5 - 10	Cpp 11 – 3 (mg/kg or pCi/g) Sample Depth (ft) 0 - 0.5	Cpp 11 – 3 (mg/kg or pCi/g) Sample Depth (ft) 2.5 - 5	Cpp 11 – 3 (mg/kg or pCi/g) Sample Depth (ft) 5 - 7.5
Th-230		1.4E + 04										
Th-232		1.7E + 04										
U-233		1.6E + 08										
U-234		6.0E + 06						1.2E+00				
U-235		1.1E + 05						ND				
U-236		2.0E + 05										
U-238		2.0E + 06						1.0E+00				
Y-90		2.3E + 10										

NOTES: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
z. Duplicate sample result

ND - Not Detected (concentration reported was below the detection limit)
NA - Not Applicable

B - Sample result is greater than the instrument detection limit, but less than the contract required detection limit.
J - The sample concentration reported is an estimated value as a result of data validation.

Table A-18. CPP-13 – pressurization of solid storage cyclone northeast of CPP-633.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 13 – 1 (mg/kg or pCi/g) Sample Depth (ft) 0.5 - 1	CPP 13 – 1 (mg/kg or pCi/g) Sample Depth (ft) 1 - 2.5	CPP 13 – 1 (mg/kg or pCi/g) Sample Depth (ft) 7.5 - 10	CPP 13 – 1 (mg/kg or pCi/g) Sample Depth (ft) 7.5 - 10[z]	CPP 13 – 2 (mg/kg or pCi/g) Sample Depth (ft) 0.5 - 1	CPP 13 – 2 (mg/kg or pCi/g) Sample Depth (ft) 2.5 - 4	CPP 13 – (mg/kg or pCi/g) Sample Depth (ft) 0.5 - 1	CPP 13 – (mg/kg or pCi/g) Sample Depth (ft) 2.5 - 4
Organics				NOT Analyzed							
Inorganics											
Aluminum	1.6E + 05			6.2E+03	4.8E+03	6.2E+03	5.5E+03	5.5E+03	5.1E+03	6.4E+03	4.7E+03
Antimony	5.8E + 03			ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	5.8E + 01			6.1E+00	7.0E+00 B	5.3E+00 B	5.2E+00	5.8E+00 B	5.9E+00	8.3E+00	5.7E+00
Barium	3.0E + 03			1.1E+02	8.4E+01	1.1E+02	9.5E+01	8.1E+01	7.6E+01	1.0E+02	7.6E+01
Beryllium	1.8E + 01			4.6E-01	3.8E-01	4.4E-01	4.3E-01	4.3E-01 B	4.4E-01 B	5.3E-01 B	3.8E-01 B
Boron	3.3E + 03										
Cadmium	3.6E + 03			ND	ND	ND	ND	ND	ND	ND	ND
Calcium	NA			1.4E+04	7.0E+03	1.6E+04	1.4E+04	4.1E+03 J	5.2E+03 J	6.8E+03 J	7.9E+03 J
Chloride	3.3E + 04										
Chromium	4.1E + 04			1.6E+01	1.2E+01	1.5E+01	1.4E+01	1.2E+01	1.2E+01	1.7E+01	1.2E+01
Cobalt	1.1E + 02			5.6E+00 B	4.2E+00 B	5.4E+00 B	4.8E+00 B	4.3E+00 B	4.2E+00 B	5.1E+00 B	4.1E+00 B
Copper	3.0E + 04			1.7E+01 J	1.2E+01 J	1.5E+01 J	1.5E+01 J	1.3E+01	1.3E+01	1.6E+01	1.3E+01
Cyanide	3.4E + 02										
Dysprosium	5.9E + 04										
Fluoride	3.9E + 03										
Iron	2.4E + 05			1.2E+04	9.6E+03	1.2E+04	1.1E+04	9.3E+03	9.1E+03	1.2E+04	8.6E+03
Lead	5.8E + 04			1.4E+01	7.6E+00	6.9E+00	6.3E+00	7.1E+00	8.2E+00	8.5E+00	7.6E+00
Magnesium	1.2E + 05			3.9E+03	2.8E+03	3.8E+03	3.4E+03	3.2E+03	3.1E+03	3.8E+03	3.0E+03
Manganese	4.9E + 03			2.6E+02 J	1.7E+02 J	2.0E+02 J	1.9E+02 J	1.6E+02 J	1.6E+02 J	2.1E+02 J	1.4E+02 J
Mercury	9.5E + 03		2.3E+01	2.8E-01	1.3E-01	9.1E-01	2.8E-01	ND	ND	ND	ND
Molybdenum	1.0E + 04										
Nickel	3.5E + 02			2.0E+01	1.4E+01	1.7E+01	1.5E+01	1.4E+01	1.5E+01	1.8E+01	1.4E+01
Nitrate	3.9E + 03										
Nitrate/Nitrite-N	3.3E + 04										
Nitrite	8.5E + 00										
Phosphate	3.30E+04										
Phosphorus	NA										
Potassium	4.3E + 04			1.20E+03	8.8E+02 B	1.1E+03 B	9.0E+02 B	8.7E+02 B	8.0E+02 B	1.10E+03	7.6E+02 B
Selenium	8.5E + 02			6.8E-01 B	ND	9.1E-01 B	8.8E-01 B	9.6E-01 B	ND	8.1E-01 B	ND
Silicon	3.30E+04										
Silver	9.8E + 03			ND	ND	ND	ND	ND	ND	ND	ND
Sodium	3.2E + 03			1.4E+02 BJ	9.1E+01 BJ	1.1E+02 BJ	1.1E+02 BJ	9.5E+01 B	1.0E+02 B	1.1E+02 B	1.0E+02 B
Strontium	1.8E + 04										
Sulfate	3.3E + 04										
Sulfide	3.3E + 04										
Terbium	NA										
Thallium	4.3E + 00			ND	ND	ND	ND	ND	ND	ND	ND
Tin	3.00E+03										

Table A-18. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 13 – 1 (mg/kg or pCi/g) Sample Depth (ft) 0.5 - 1	CPP 13 – 1 (mg/kg or pCi/g) Sample Depth (ft) 1 - 2.5	CPP 13 – 1 (mg/kg or pCi/g) Sample Depth (ft) 7.5 - 10	CPP 13 – 1 (mg/kg or pCi/g) Sample Depth (ft) 7.5 - 10[z]	CPP 13 – 2 (mg/kg or pCi/g) Sample Depth (ft) 0.5 - 1	CPP 13 – 2 (mg/kg or pCi/g) Sample Depth (ft) 2.5 - 4	CPP 13 – (mg/kg or pCi/g) Sample Depth (ft) 0.5 - 1	CPP 13 – (mg/kg or pCi/g) Sample Depth (ft) 2.5 - 4
Vanadium	4.5E + 02			2.3E+01	1.9E+01	2.4E+01	2.3E+01	1.9E+01	2.0E+01	2.7E+01	1.7E+01
Ytterbium	NA										
Zinc	2.1E + 05			8.6E+01	3.8E+01	5.7E+01	4.6E+01	4.1E+01	4.6E+01	5.1E+01	4.2E+01
Zirconium	NA			1.2E+01	7.5E+00	1.4E+01	1.2E+01	1.1E+01	1.0E+01	1.2E+01	1.0E+01
Radionuclides											
Ag-108m		8.0E + 05									
Am-241		1.0E + 04	2.9E+02								
Am-243		3.3E + 02									
Ba-137m		NA									
C-14		3.0E + 03									
Cd-113m		1.6E + 06									
Ce-144		1.8E + 03		ND	ND	ND	ND	ND	ND	ND	ND
Co-57		3.7E + 03									
Co-58		NA		ND	ND	ND	ND	ND	ND	ND	ND
Co-60		1.9E + 08		ND	ND	ND	ND	ND	ND	4.9E-01	9.0E-01
Cs-134		1.1E + 07		ND	ND	ND	ND	ND	ND	6.0E-01	ND
Cs-137		2.3E + 12	2.3E+01	2.8E+00	1.2E+00	8.0E-02	ND	4.7E+01	4.6E+01	3.7E+03	4.6E+03
Eu-152		9.7E + 08	2.7E+02								
Eu-154		8.2E + 08	5.2E+03	ND	ND	ND	ND	ND	ND	2.2E+01	3.1E+01
Eu-155		1.8E + 08		ND	ND	ND	ND	ND	ND	ND	ND
H-3		5.0E + 07									
I-129		3.1E + 03									
K-40		2.4E + 05									
Kr-85		NA									
Nb-95		NA		ND	ND	ND	ND	ND	ND	ND	ND
Np-237		6.4E + 05									
Pm-147		3.8E + 08									
Pu-238		1.0E + 07	6.7E+02								
Pu-239		6.7E + 06	2.5E+02								
Pu-240		1.5E + 06	2.5E+02								
Pu-241		6.4E + 07	5.6E+04								
Ra-226		4.7E + 05									
Ru-103		NA		ND	ND	ND	ND	ND	ND	ND	ND
Ru-106		1.2E + 04		ND	ND	ND	ND	ND	ND	ND	ND
Sb-125		9.3E + 06		ND	ND	ND	ND	ND	ND	ND	ND
Sm-151		3.4E + 08									
Sr-90		3.5E + 12	2.2E+02	4.7E+00				2.9E+01	2.6E+01	4.2E+03	2.6E+03
Tc-99		5.8E + 06						9.0E-01	ND	2.7E+00	1.4E+00
Te-125m		2.3E + 06									
Th-228		1.6E + 04									
Th-230		1.4E + 04									
Th-232		1.7E + 04									

Table A-18. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 13 – 1 (mg/kg or pCi/g) Sample Depth (ft) 0.5 - 1	CPP 13 – 1 (mg/kg or pCi/g) Sample Depth (ft) 1 - 2.5	CPP 13 – 1 (mg/kg or pCi/g) Sample Depth (ft) 7.5 - 10	CPP 13 – 1 (mg/kg or pCi/g) Sample Depth (ft) 7.5 - 10[z]	CPP 13 – 2 (mg/kg or pCi/g) Sample Depth (ft) 0.5 - 1	CPP 13 – 2 (mg/kg or pCi/g) Sample Depth (ft) 2.5 - 4	CPP 13 – (mg/kg or pCi/g) Sample Depth (ft) 0.5 - 1	CPP 13 – (mg/kg or pCi/g) Sample Depth (ft) 2.5 - 4
U-233		1.6E + 08									
U-234		6.0E + 06									
U-235		1.1E + 05									
U-236		2.0E + 05									
U-238		2.0E + 06									
Y-90		2.3E + 10									

NOTES: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
z. Duplicate sample result

ND - Not Detected (concentration reported was below the detection limit)
NA - Not Applicable

B - Sample result is greater than the instrument detection limit, but less than the contract required detection limit.
J - The sample concentration reported is an estimated value as a result of data validation.

Table A-19. CPP-14 – old storage treatment plant/IMHOFF.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 14 - PLANT (mg/kg or pCi/g) Sample Depth (ft) 3	3.5	5	7	CPP 14 - IMHOFF (mg/kg or pCi/g) Sample Depth (ft) 9	10
Organics									
1,1,1-Trichloroethane	1.6E + 01								
1,1,2,2-Tetrachloroethane	5.0E - 02								
1,1,2-Trichloroethane	2.4E - 01								
1,1-Dichloroethane	2.3E + 00								
1,1-Dichloroethene	1.5E + 00								
1,2,4-Trichlorobenzene	1.1E + 01								
1,2-Dichlorobenzene	1.1E + 01								
1,2-Dichloroethane	5.4E - 03								
1,2-Dichloroethene (total)	3.2E - 01							3.0E-03 J	
1,3-Dichlorobenzene	1.1E + 01								
1,4-Dichlorobenzene	4.4E + 01								3.1E-01 J
1,4-Dioxane	1.9E - 02								
2,4,5-Trichlorophenol	4.5E + 01								
2,4,6-Trichlorophenol	1.8E + 01								
2,4-Dichlorophenol	2.2E + 01								
2,4-Dimethylphenol	1.8E + 01								
2,4-Dinitrophenol	5.1E + 01								
2,4-Dinitrotoluene	1.1E + 01								
2,6-Dinitrotoluene	2.1E + 01								
2-Butanone	2.5E + 01								
2-Chloronaphthalene	1.1E + 01								
2-Chlorophenol	1.8E + 01								
2-Hexanone	2.7E + 00								
2-Methylnaphthalene	5.1E + 02								
2-Methylphenol	2.1E + 01								
2-Nitroaniline	1.0E - 01								
2-Nitrophenol	1.8E + 01								
3,3-Dichlorobenzidine	1.1E + 01								
3-Methyl Butanal	3.3E + 04								
3-Nitroaniline	1.0E - 01								
4,6-Dinitro-2-methylphenol	4.5E + 01								
4-Bromophenyl-phenylether	8.5E + 04								
4-Chloro-3-methylphenol	9.6E + 04								
4-Chloroaniline	4.1E + 01							6.4E-01 J	1.1E+00 J
4-Chlorophenyl-phenylether	1.0E + 05								
4-Methyl-2-Pentanone	3.0E + 01								
4-Methylphenol	3.9E + 01							7.6E-01 J	
4-Nitroaniline	1.0E - 01								
4-Nitrophenol	5.2E + 01								
Acenaphthene	2.0E + 02								
Acenaphthylene	2.1E + 01								
Acetone	4.9E + 01							1.3E-02	2.1E-02
Acetonitrile	1.2E + 00								

Table A-19. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 14 - PLANT (mg/kg or pCi/g) Sample Depth (ft) 3	3.5	5	7	CPP 14 - IMHOFF (mg/kg or pCi/g) Sample Depth (ft) 9	10
Acrolein	5.5E - 01								
Acrylonitrile	5.8E - 01								
Anthracene	3.2E + 02								
Aramite	6.7E + 00								
Aroclor-1016	7.7E + 00								
Aroclor-1254	1.3E + 02				2.1E-02 J				
Aroclor-1260	5.0E + 02			1.0E-01 J		5.7E-01 J		6.00E+00	2.30E+01
Aroclor-1268	6.2E + 01								
Benzene	2.2E + 02								
Benzidine	1.7E + 01								
Benzo(a)anthracene	2.5E + 02							1.5E-01 J	3.8E-01 J
Benzo(a)pyrene	1.1E + 02								3.4E-01 J
Benzo(b)fluoranthene	1.8E + 02								3.2E-01 J
Benzo(g,h,i)perylene	1.1E + 01								
Benzo(k)fluoranthene	1.9E + 01								2.7E-01 J
Benzoic acid	8.6E + 00							2.3E-01 J	3.2E-01 J
bis(2-Chloroethoxy)methane	1.6E + 02								
bis(2-Chloroethyl)ether	1.1E + 01								
bis(2-Chloroisopropyl)ether	1.1E + 01								
bis(2-Ethylhexyl)phthalate	1.5E + 02							9.8E-01	1.7E+00
Butane,1,1,3,4-Tetrachloro-	1.0E + 05								
Butylbenzylphthalate	6.8E + 01								
Carbazole	3.2E + 01								
Carbon Disulfide	4.6E + 01								
Chlorobenzene	6.6E + 00								
Chloroethane	1.5E - 01								
Chloromethane	3.5E - 01								
Chrysene	2.7E + 02								3.8E-01 J
Decane, 3,4-Dimethyl	3.3E + 04								
Diacetone alcohol	1.0E + 05								
Dibenz(a,h)anthracene	1.1E + 01								
Dibenzofuran	3.2E + 02								
Diethylphthalate	1.1E + 01								
Dimethyl Disulfide	3.3E + 04								
Dimethylphthalate	1.1E + 01								
Di-n-butylphthalate	2.4E + 01								
Di-n-octylphthalate	2.6E + 01								2.9E-01 J
Eicosane	1.0E + 05								
Ethyl cyanide	3.3E + 04								
Ethylbenzene	7.8E + 01								
Famphur	1.0E + 05								
Fluoranthene	7.6E + 02							2.4E-01 J	7.2E-01 J
Fluorene	1.8E + 02								
Heptadecane, 2,6,10,15-Tetra	3.3E + 04								
Hexachlorobenzene	1.1E + 01								
Hexachlorobutadiene	2.1E + 01								

Table A-19. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 14 - PLANT (mg/kg or pCi/g) Sample Depth (ft) 3	3.5	5	7	CPP 14 - IMHOFF (mg/kg or pCi/g) Sample Depth (ft) 9	10
Hexachlorocyclopentadiene	1.1E + 01								
Hexachloroethane	1.1E + 01								
Indeno(1,2,3-cd)pyrene	1.1E + 01								
Isobutyl alcohol	1.2E + 00								
Isophorone	1.1E + 01								
Isopropyl Alcohol/2-propanol	1.0E + 05								
Kepone	9.9E + 01								
Mesityl oxide	1.0E + 05								
Methyl Acetate	4.8E - 01								
Methylene Chloride	2.7E + 01								1.2E-01 B
Naphthalene	4.3E + 02							1.3E+00	1.7E-01 J
Nitrobenzene	1.1E + 01								
N-Nitroso-di-n-propylamine	1.1E + 01								
N-Nitrosodiphenylamine	1.1E + 01								
Octane,2,3,7-Trimethyl	3.3E + 04								
o-Toluenesulfonamide	3.3E + 04								
Pentachlorophenol	5.6E + 01								
Phenanthrene	1.2E + 03							1.5E-01 J	3.7E-01 J
Phenol	8.0E + 01							2.3E+00	2.2E-01 J
Phenol,2,6-Bis(1,1-Dimethyl)	1.0E + 05								
p-Toluenesulfonamide	3.3E + 04								
Pyrene	2.5E + 02							3.0E-01 J	6.6E-01 J
RDX	1.0E + 01								
Styrene	6.1E - 02								
Tetrachloroethene	9.6E + 00		1.0E-03 J						
Toluene	3.0E + 01							2.9E-02	6.0E-03 J
Tributylphosphate	4.8E + 02								
Trichloroethene	3.1E + 01								
Trinitrotoluene	1.1E + 01								
Undecane,4,6-Dimethyl-	3.3E + 02								
Xylene (ortho)	3.9E + 00								
Xylene (total)	2.8E + 02							5.0E-03 J	2.7E-02
Inorganics									
Aluminum	1.6E + 05			4.3E+03	3.1E+03 J			9.0E+03	8.8E+03
Antimony	5.8E + 03			ND	ND			2.00E+01	ND
Arsenic	5.8E + 01			3.8E+00 J	ND			4.6E+00	4.9E+00
Barium	3.0E + 03			9.5E+01	6.7E+01			1.8E+02	2.1E+02
Beryllium	1.8E + 01			4.7E-01 B	2.4E-01 B			5.3E-01 B	5.6E-01 B
Boron	3.3E + 03								
Cadmium	3.6E + 03			6.6E-01 J	ND			ND	ND
Calcium	NA			1.2E+04 J	1.5E+04			2.7E+04 J	6.9E+04 J
Chloride	3.3E + 04								
Chromium	4.1E + 04			1.8E+01	1.2E+01 J			5.1E+01	6.1E+01
Cobalt	1.1E + 02			5.6E+00 B	ND			ND	ND
Copper	3.0E + 04			1.0E+01	ND			ND	9.60E+01

Table A-19. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 14 - PLANT (mg/kg or pCi/g) Sample Depth (ft) 3	3.5	5	7	CPP 14 - IMHOFF (mg/kg or pCi/g) Sample Depth (ft) 9	10
Cyanide	3.4E + 02				ND	ND		ND	ND
Dysprosium	5.9E + 04								
Fluoride	3.9E + 03								
Iron	2.4E + 05				7.3E+03	6.9E+03		1.4E+04	2.2E+04
Lead	5.8E + 04				1.0E+01	ND		3.6E+01 J	2.1E+02
Magnesium	1.2E + 05				3.6E+03	2.5E+03		5.8E+03	5.6E+03
Manganese	4.9E + 03				1.6E+02	1.0E+02 J		2.5E+02	2.1E+02
Mercury	9.5E + 03		2.3E+01		ND	ND		1.2E+00	4.0E+00
Molybdenum	1.0E + 04								
Nickel	3.5E + 02				1.5E+01	1.1E+01		2.4E+01	2.6E+01
Nitrate	3.9E + 03								
Nitrate/Nitrite-N	3.3E + 04								
Nitrite	8.5E + 00								
Phosphate	3.30E+04								
Phosphorus	NA								
Potassium	4.3E + 04				7.5E+02 B	6.1E+02 J		1.9E+03 J	1.9E+03 J
Selenium	8.5E + 02				ND	ND		ND	ND
Silicon	3.30E+04								
Silver	9.8E + 03				3.0E+00 J	ND		1.2E+01	4.9E+01
Sodium	3.2E + 03				9.0E+01 B	ND		2.7E+02 B	5.5E+02 J
Strontium	1.8E + 04								
Sulfate	3.3E + 04								
Sulfide	3.3E + 04								
Terbium	NA								
Thallium	4.3E + 00				ND	ND		2.4E-01 B	ND
Tin	3.00E+03								
Vanadium	4.5E + 02				1.4E+01	1.5E+01		3.1E+01	3.5E+01
Ytterbium	NA								
Zinc	2.1E + 05				ND	3.8E+01		1.4E+02	4.8E+02
Zirconium	NA								
Radionuclides									
Ag-108m		8.0E + 05							
Am-241		1.0E + 04	2.9E+02		ND	ND	ND	ND	ND
Am-243		3.3E + 02							
Ba-137m		NA							
C-14		3.0E + 03							
Cd-113m		1.6E + 06							
Ce-144		1.8E + 03			ND	ND	ND	ND	ND
Co-57		3.7E + 03							
Co-58		NA			ND	ND	ND	ND	ND
Co-60		1.9E + 08			ND	ND	ND	ND	ND
Cs-134		1.1E + 07			ND	ND	ND	ND	ND
Cs-137		2.3E + 12	2.3E+01		7.7E-01	3.9E+00	1.8E+00	4.9E+00	6.2E+00
Eu-152		9.7E + 08	2.7E+02						
Eu-154		8.2E + 08	5.2E+03						

Table A-19. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 14 - PLANT (mg/kg or pCi/g) Sample Depth (ft) 3	3.5	5	7	CPP 14 - IMHOFF (mg/kg or pCi/g) Sample Depth (ft) 9	10
Eu-155		1.8E + 08							
H-3		5.0E + 07							
I-129		3.1E + 03			ND	ND	ND	ND	ND
K-40		2.4E + 05							
Kr-85		NA							
Np-237		6.4E + 05			3.5E+00	2.5E+00	4.5E-01	2.0E+00	1.7E+00
Pm-147		3.8E + 08							
Pu-238		1.0E + 07	6.7E+02		ND	ND	ND	ND	ND
Pu-239[c]		6.7E + 06	2.5E+02		ND	ND	ND	ND	ND
Pu-240[c]		1.5E + 06	2.5E+02		ND	ND	ND	ND	ND
Pu-241		6.4E + 07	5.6E+04						
Ra-226		4.7E + 05							
Ru-103		NA			ND	ND	ND	ND	ND
Ru-106		1.2E + 04			ND	ND	ND	ND	ND
Sb-125		9.3E + 06			ND	ND	ND	ND	ND
Sm-151		3.4E + 08							
Sr-90		3.5E + 12	2.2E+02		1.9E-01	3.5E-01	5.7E-01	7.1E-01	1.1E+00
Tc-99		5.8E + 06							
Te-125m		2.3E + 06							
Th-228		1.6E + 04							
Th-230		1.4E + 04							
Th-232		1.7E + 04							
U-233		1.6E + 08							
U-234		6.0E + 06			1.7E-01	4.3E-01	2.1E-01	7.9E-01	1.2E+00
U-235		1.1E + 05			ND	ND	ND	ND	ND
U-236		2.0E + 05							
U-238		2.0E + 06			1.4E-01	3.8E-01	1.4E-01	5.3E-01	5.1E-01
Y-90		2.3E + 10				4.0E-01		7.0E-01	1.1E+00

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

B - Sample result is greater than the instrument detection limit, but less than the contract required detection limit.
J - The sample concentration reported is an estimated value as a result of data validation.

ND - Non-Detect (value is below the minimum dection limit)
NA - Not Applicable

Table A-20. CPP-19 – CPP-603 to CPP-604 line leak.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 19 – 1 (mg/kg or pCi/g) Sample Depth (ft) 0 - 0.5	CPP 19 – 1 (mg/kg or pCi/g) Sample Depth (ft) 0.5 - 1.5	CPP 19 – 2 (mg/kg or pCi/g) Sample Depth (ft) 0 - 0.5	CPP 19 – 2 (mg/kg or pCi/g) Sample Depth (ft) 2 - 4	CPP 19 – 2 (mg/kg or pCi/g) Sample Depth (ft) 4 - 6
Organics				NOT Analyzed				
Inorganics				NOT Analyzed				
Radionuclides								
Ag-108m		8.0E + 05						
Am-241		1.0E + 04	2.9E+02					2.0E+00
Am-243		3.3E + 02						
Ba-137m		NA						
C-14		3.0E + 03						
Cd-113m		1.6E + 06						
Ce-144		1.8E + 03						
Co-57		3.7E + 03						
Co-60		1.9E + 08						2.2E+04
Cs-134		1.1E + 07						
Cs-137		2.3E + 12	2.3E+01	1.1E+01	2.4E+00	7.4E+01	8.2E+00	4.1E+05
Eu-152		9.7E + 08	2.7E+02	1.5E+00				8.8E+04
Eu-154		8.2E + 08	5.2E+03					5.4E+04
Eu-155		1.8E + 08						9.6E+03
H-3		5.0E + 07						
I-129		3.1E + 03						
K-40		2.4E + 05			2.0E+01			
Kr-85		NA						
Np-237		6.4E + 05						
Pm-147		3.8E + 08						
Pu-238		1.0E + 07	6.7E+02					
Pu-239		6.7E + 06	2.5E+02					1.4E+02J
Pu-240		1.5E + 06	2.5E+02					1.4E+02J
Pu-241		6.4E + 07	5.6E+04					
Ra-226		4.7E + 05						
Ru-106		1.2E + 04						
Sb-125		9.3E + 06						
Sm-151		3.4E + 08						
Sr-90		3.5E + 12	2.2E+02	2.9E+01	3.3E+01	5.0E+01	5.2E+01	1.3E+05
Tc-99		5.8E + 06						
Te-125m		2.3E + 06						
Th-228		1.6E + 04						
Th-230		1.4E + 04						
Th-232		1.7E + 04						
U-233		1.6E + 08						
U-234		6.0E + 06						

Table A-20. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 19 – 1 (mg/kg or pCi/g) Sample Depth (ft) 0 - 0.5	CPP 19 – 1 (mg/kg or pCi/g) Sample Depth (ft) 0.5 - 1.5	CPP 19 – 2 (mg/kg or pCi/g) Sample Depth (ft) 0 - 0.5	CPP 19 – 2 (mg/kg or pCi/g) Sample Depth (ft) 2 - 4	CPP 19 – 2 (mg/kg or pCi/g) Sample Depth (ft) 4 - 6
U-235		1.1E + 05						2.4E+00
U-236		2.0E + 05						
U-238		2.0E + 06						4.5E-01
Y-90		2.3E + 10						

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum dection limit)
NA - Not Applicable

Table A-21. CPP-19 – CPP-603 to CPP-604 line leak.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a]		Remediation Goals (RGs) from ROD[b]	CPP 19 – 3 (mg/kg or pCi/g) Sample Depth (ft)			CPP 19 – 4 (mg/kg or pCi/g) Sample Depth (ft)			
	(mg/kg)	(pCi/g)	(mg/kg or pCi/g)	0 - 0.5	2.5 - 5	5 - 7.5	0.5 - 2.5	2.5 - 5	2.5 - 5[z]	7.5 - 10
Organics				NOT Analyzed						
Inorganics										
Aluminum	1.6E + 05			5.00E+03	8.80E+03	9.4E+03	3.1E+03	2.5E+03	2.4E+03	1.3E+03
Antimony	5.8E + 03			ND	7.6E-01 B	5.3E-01 B	8.1E-01 B	ND	ND	ND
Arsenic	5.8E + 01			3.30E+00	3.90E+00	5.80E+00	4.0E+00 J	8.3E+00 J	4.3E+00 J	3.1E+00 J
Barium	3.0E + 03			8.80E+01	1.50E+02	1.60E+02	7.60E+01	7.20E+01	6.70E+01	4.50E+01
Beryllium	1.8E + 01			4.20E-01	6.30E-01	6.60E-01	3.30E-01	2.90E-01	2.60E-01	1.60E-01
Boron	3.3E + 03									
Cadmium	3.6E + 03			4.7E-01 B	7.5E-01 B	7.4E-01 B	2.6E-01 B	2.3E-01 B	1.9E-01 B	1.3E-01 B
Calcium	NA			1.90E+04	1.80E+04	2.80E+04	1.60E+04	1.10E+04	9.40E+03	2.30E+04
Chloride	3.3E + 04									
Chromium	4.1E + 04			1.7E+01	2.2E+01	2.6E+01	8.3E+00 J	6.9E+00 J	6.8E+00 J	5.1E+00 J
Cobalt	1.1E + 02			5.1E+00 B	7.6E+00 B	8.2E+00 B	3.6E+00 B	3.0E+00 B	3.0E+00 B	1.9E+00 B
Copper	3.0E + 04			1.40E+01	1.50E+01	1.60E+01	9.00E+00	8.20E+00	7.60E+00	6.00E+00
Cyanide	3.4E + 02									
Dysprosium	5.9E + 04									
Fluoride	3.9E + 03									
Iron	2.4E + 05			1.2E+04	1.6E+04	1.8E+04	6.8E+03	5.8E+03	5.6E+03	3.5E+03
Lead	5.8E + 04			5.70E+00	1.00E+01	9.20E+00	6.3E+00 J	6.7E+00 J	6.6E+00 J	3.8E+00 J
Magnesium	1.2E + 05			3.90E+03	5.90E+03	7.40E+03	2.60E+03	2.10E+03	2.00E+03	1.80E+03
Manganese	4.9E + 03			2.1E+02 J	2.9E+02 J	2.7E+02 J	1.40E+02	1.30E+02	1.20E+02	9.10E+01
Mercury	9.5E + 03		2.3E+01	ND	ND	ND	ND	ND	ND	ND
Molybdenum	1.0E + 04									
Nickel	3.5E + 02			1.9E+01	2.3E+01	2.6E+01	1.3E+01	1.0E+01	1.0E+01	8.4E+00 B
Nitrate	3.9E + 03									
Nitrate/Nitrite-N	3.3E + 04									
Nitrite	8.5E + 00									
Phosphate	3.30E+04									
Phosphorus	NA									
Potassium	4.3E + 04			9.1E+02 J	1.7E+03 J	1.5E+03 J	6.1E+02 J	4.6E+02 J	4.2E+02 J	2.3E+02 J
Selenium	8.5E + 02			ND	ND	ND	ND	ND	ND	ND
Silicon	3.30E+04									
Silver	9.8E + 03			ND	ND	ND	ND	ND	ND	ND
Sodium	3.2E + 03			1.1E+02 J	1.7E+02 J	2.2E+02 J	7.9E+01 B	7.0E+01 B	6.9E+01 B	6.5E+01 B
Strontium	1.8E + 04									
Sulfate	3.3E + 04									
Sulfide	3.3E + 04									
Terbium	NA									
Thallium	4.3E + 00			ND	ND	ND	ND	ND	ND	ND
Tin	3.00E+03									

Table A-21. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a]		Remediation Goals (RGs) from ROD[b]	CPP 19 – 3 (mg/kg or pCi/g) Sample Depth (ft)			CPP 19 – 4 (mg/kg or pCi/g) Sample Depth (ft)			
	(mg/kg)	(pCi/g)	(mg/kg or pCi/g)	0 - 0.5	2.5 - 5	5 - 7.5	0.5 - 2.5	2.5 - 5	2.5 - 5[z]	7.5 - 10
Vanadium	4.5E + 02			2.5E+01	3.1E+01	3.6E+01	1.1E+01	9.3E+00 B	9.2E+00 B	6.5E+01 B
Ytterbium	NA									
Zinc	2.1E + 05			5.0E+01	7.9E+01	8.6E+01	4.1E+01 J	3.8E+01 J	3.7E+01 J	2.2E+01 J
Zirconium	NA									
Radionuclides										
Ag-108m		8.0E + 05								
Am-241		1.0E + 04	2.9E+02							
Am-243		3.3E + 02								
Ba-137m		NA								
C-14		3.0E + 03								
Cd-113m		1.6E + 06								
Ce-144		1.8E + 03								
Co-57		3.7E + 03								
Co-58		NA		ND	ND	ND	ND	ND	ND	ND
Co-60		1.9E + 08		1.9E-01	ND	ND	ND	ND	ND	ND
Cs-134		1.1E + 07		ND	ND	ND	ND	ND	ND	ND
Cs-137		2.3E + 12	2.3E+01	1.2E+01	1.9E-01	6.0E-02	1.8E+00	4.4E+00	8.6E-01	ND
Eu-152		9.7E + 08	2.7E+02							
Eu-154		8.2E + 08	5.2E+03	7.6E-01	ND	ND	1.7E-01	ND	ND	ND
Eu-155		1.8E + 08		ND	ND	ND	ND	2.4E-01	ND	1.6E-01
H-3		5.0E + 07								
I-129		3.1E + 03								
K-40		2.4E + 05								
Kr-85		NA								
Nb-95		NA		ND	ND	ND	9.00E-02	8.00E-02	ND	ND
Np-237		6.4E + 05								
Pm-147		3.8E + 08								
Pu-238		1.0E + 07	6.7E+02							
Pu-239		6.7E + 06	2.5E+02							
Pu-240		1.5E + 06	2.5E+02							
Pu-241		6.4E + 07	5.6E+04							
Ra-226		4.7E + 05								
Ru-103		NA		ND	ND	ND	ND	ND	ND	ND
Ru-106		1.2E + 04								
Sb-125		9.3E + 06		ND	ND	ND	ND	ND	ND	ND
Sm-151		3.4E + 08								
Sr-90		3.5E + 12	2.2E+02							
Tc-99		5.8E + 06								
Te-125m		2.3E + 06								
Th-228		1.6E + 04								
Th-230		1.4E + 04								
Th-232		1.7E + 04								

Table A-21. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a]		Remediation Goals (RGs) from ROD[b]	CPP 19 – 3 (mg/kg or pCi/g) Sample Depth (ft)			CPP 19 – 4 (mg/kg or pCi/g) Sample Depth (ft)			
	(mg/kg)	(pCi/g)	(mg/kg or pCi/g)	0 - 0.5	2.5 - 5	5 - 7.5	0.5 - 2.5	2.5 - 5	2.5 - 5[z]	7.5 - 10
U-233		1.6E + 08								
U-234		6.0E + 06								
U-235		1.1E + 05								
U-236		2.0E + 05								
U-238		2.0E + 06								
Y-90		2.3E + 10								

NOTES: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
z. Duplicate sample result

ND - Not Detected (concentration reported was below the detection limit)
NA - Not Applicable

B - Sample result is greater than the instrument detection limit, but less than the contract required detection limit.
J - The sample concentration reported is an estimated value as a result of data validation.

Table A-22. CPP-35 – CPP-633 decontamination spill.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 35 - 1 (mg/kg or pCi/g) Sample Depth (ft) 0 - 2	2- 4	4 - 6	10 - 12	CPP 35 - 2 (mg/kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6	4 - 6[z]	10 - 12
Organics				NOT Analyzed								
Inorganics												
Aluminum	1.6E + 05											
Antimony	5.8E + 03											
Arsenic	5.8E + 01											
Barium	3.0E + 03											
Beryllium	1.8E + 01											
Boron	3.3E + 03											
Cadmium	3.6E + 03			ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	NA											
Chloride	3.3E + 04											
Chromium	4.1E + 04											
Cobalt	1.1E + 02											
Copper	3.0E + 04											
Cyanide	3.4E + 02											
Dysprosium	5.9E + 04											
Fluoride	3.9E + 03			1.0E+00 J	1.4E+00 J	1.1E+00 J	1.4E+00 J	1.9E+00 J	1.6E+00 J	1.6E+00 J	1.2E+00 J	1.4E+00 J
Iron	2.4E + 05											
Lead	5.8E + 04											
Magnesium	1.2E + 05											
Manganese	4.9E + 03											
Mercury	9.5E + 03		2.3E+01	1.6E+00	7.2E+00	6.0E+00	1.8E-01	3.1E+00	3.4E-01	2.1E-01	1.7E-01	9.9E-01
Molybdenum	1.0E + 04											
Nickel	3.5E + 02											
Nitrate	3.9E + 03			ND	ND	ND	ND	2.3E+00 J	8.9E-01 J	1.2E+00 J	1.0E+00 J	1.3E+00 J
Nitrate/Nitrite-N	3.3E + 04											
Nitrite	8.5E + 00			ND	ND	ND	ND	ND	ND	ND	ND	ND
Phosphate	3.30E+04											
Phosphorus	NA											
Potassium	4.3E + 04											
Selenium	8.5E + 02											
Silicon	3.30E+04											
Silver	9.8E + 03											
Sodium	3.2E + 03											
Strontium	1.8E + 04											
Sulfate	3.3E + 04											
Sulfide	3.3E + 04											
Terbium	NA											
Thallium	4.3E + 00											
Tin	3.00E+03											

Table A-22. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 35 - 1 (mg/kg or pCi/g) Sample Depth (ft) 0 - 2	2- 4	4 - 6	10 - 12	CPP 35 - 2 (mg/kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6	4 - 6[z]	10 - 12
Vanadium	4.5E + 02											
Ytterbium	NA											
Zinc	2.1E + 05											
Zirconium	NA											
Radionuclides												
Ag-108m		8.0E + 05										
Am-241		1.0E + 04	2.9E+02		1.4E-01	2.0E-01		1.2E+00				
Am-243		3.3E + 02										
Ba-137m		NA										
C-14		3.0E + 03										
Cd-113m		1.6E + 06										
Ce-144		1.8E + 03										
Co-57		3.7E + 03										
Co-60		1.9E + 08										
Cs-134		1.1E + 07										
Cs-137		2.3E + 12	2.3E+01	1.3E+02	5.0E+02	9.1E+02	8.6E+00	8.6E+03	2.5E+02	9.8E+01	7.7E+01	1.2E+00
Eu-152		9.7E + 08	2.7E+02									
Eu-154		8.2E + 08	5.2E+03		1.3E+00	2.8E+00		1.2E+01	3.2E-01	5.8E-01		
Eu-155		1.8E + 08										
H-3		5.0E + 07										
I-129		3.1E + 03										
K-40		2.4E + 05		2.0E+01	2.4E+01	1.8E+01	1.7E+01	1.5E+01	2.1E+01	1.8E+01	1.7E+01	2.1E+01
Kr-85		NA										
Np-237		6.4E + 05										
Pm-147		3.8E + 08										
Pu-238		1.0E + 07	6.7E+02		7.9E-01	2.3E+00		1.3E+01				
Pu-239[c]		6.7E + 06	2.5E+02		5.2E-02	1.9E-01		7.3E-01				
Pu-240[c]		1.5E + 06	2.5E+02		5.2E-02	1.9E-01		7.3E-01				
Pu-241		6.4E + 07	5.6E+04									
Ra-226		4.7E + 05										
Ru-106		1.2E + 04										
Sb-125		9.3E + 06										
Sm-151		3.4E + 08										
Sr-90		3.5E + 12	2.2E+02	8.1E+01	2.7E+02	6.3E+02	9.7E+00	3.2E+03	2.8E+02	9.5E+01	8.5E+01	
Tc-99		5.8E + 06										
Te-125m		2.3E + 06										
Th-228		1.6E + 04										
Th-230		1.4E + 04										
Th-232		1.7E + 04										

Table A-22. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 35 - 1 (mg/kg or pCi/g) Sample Depth (ft) 0 - 2	2- 4	4 - 6	10 - 12	CPP 35 - 2 (mg/kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6	4 - 6[z]	10 - 12
U-233		1.6E + 08										
U-234		6.0E + 06			9.8E-01 J	1.0E+00 J		9.6E-01 J				
U-235		1.1E + 05			7.2E-02	5.2E-02		5.8E-02				
U-236		2.0E + 05										
U-238		2.0E + 06			1.1E+00	1.0E+00		1.1E+00				
Y-90		2.3E + 10										

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

J - The sample concentration reported is an estimated value as a result of data validation.

Table A-23. CPP-36 – transfer line leak from CPP-633.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 36 – 1 (mg/kg or pCi/g) Sample Depth (ft) 3 - 6	CPP 36 – 1 (mg/kg or pCi/g) Sample Depth (ft) 3 - 6[z]	CPP 36 – 1 (mg/kg or pCi/g) Sample Depth (ft) 3 - 6[z]	CPP 36 – 1 (mg/kg or pCi/g) Sample Depth (ft) 6 - 8	CPP 36 – 1 (mg/kg or pCi/g) Sample Depth (ft) 8 - 10	CPP 36 – 2 (mg/kg or pCi/g) Sample Depth (ft) 4 -6	CPP 36 – 2 (mg/kg or pCi/g) Sample Depth (ft) 6 - 8	CPP 36 – 2 (mg/kg or pCi/g) Sample Depth (ft) 8 - 10	CPP 36 – 2 (mg/kg or pCi/g) Sample Depth (ft) 8 - 10[z]
Organics				NOT Analyzed								
Inorganics												
Aluminum	1.6E + 05											
Antimony	5.8E + 03											
Arsenic	5.8E + 01											
Barium	3.0E + 03											
Beryllium	1.8E + 01											
Boron	3.3E + 03											
Cadmium	3.6E + 03			ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	NA											
Chloride	3.3E + 04											
Chromium	4.1E + 04											
Cobalt	1.1E + 02											
Copper	3.0E + 04											
Cyanide	3.4E + 02											
Dysprosium	5.9E + 04											
Fluoride	3.9E + 03			2.4E+00 J	2.3E+00 J		2.4E+00 J	2.3E+00 J	2.0E+00 J	2.4E+00 J	2.7E+00 J	2.4E+00 J
Iron	2.4E + 05											
Lead	5.8E + 04											
Magnesium	1.2E + 05											
Manganese	4.9E + 03											
Mercury	9.5E + 03	2.3E+01		4.1E+00	2.3E-01		2.7E-01	4.0E-01	1.2E-01	1.8E-01	4.2E-01	3.6E-01
Molybdenum	1.0E + 04											
Nickel	3.5E + 02											
Nitrate	3.9E + 03			3.1E+00 J	3.1E+00 J		4.4E+00 J	4.8E+00 J	3.5E+00 J	6.8E+00 J	6.1E+00 J	6.0E+00 J
Nitrate/Nitrite-N	3.3E + 04											
Nitrite	8.5E + 00			2.2E-01 J	ND		ND	ND	2.3E-01 J	2.2E-01 J	ND	ND
Phosphate	3.30E+04											
Phosphorus	NA											
Potassium	4.3E + 04											
Selenium	8.5E + 02											
Silicon	3.30E+04											
Silver	9.8E + 03											
Sodium	3.2E + 03											
Strontium	1.8E + 04											
Sulfate	3.3E + 04											
Sulfide	3.3E + 04											
Terbium	NA											
Thallium	4.3E + 00											
Tin	3.00E+03											

Table A-23. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 36 – 1 (mg/kg or pCi/g) Sample Depth (ft) 3 - 6	3 - 6[z]	3 - 6[z]	6 - 8	8 - 10	CPP 36 – 2 (mg/kg or pCi/g) Sample Depth (ft) 4 -6	6 - 8	8 - 10	8 - 10[z]
Vanadium	4.5E + 02											
Ytterbium	NA											
Zinc	2.1E + 05											
Zirconium	NA											
Radionuclides												
Ag-108m		8.0E + 05										
Am-241		1.0E + 04	2.9E+02								7.6E+02	
Am-243		3.3E + 02										
Ba-137m		NA										
C-14		3.0E + 03										
Cd-113m		1.6E + 06										
Ce-144		1.8E + 03										
Co-57		3.7E + 03										
Co-60		1.9E + 08										
Cs-134		1.1E + 07										
Cs-137		2.3E + 12	2.3E+01	3.1E+01	2.9E+01		4.6E+01	7.1E+01	2.0E+01	3.1E+01	1.2E+02	9.3E+01
Eu-152		9.7E + 08	2.7E+02									
Eu-154		8.2E + 08	5.2E+03	1.3E-01	8.8E-02			3.3E-01	2.0E-01	1.2E-01	2.9E-01	2.4E-01
Eu-155		1.8E + 08										
H-3		5.0E + 07										
I-129		3.1E + 03										
K-40		2.4E + 05		2.0E+01	1.9E+01		1.4E+01	2.1E+01	1.7E+01	1.8E+01	2.0E+01	1.8E+01
Kr-85		NA										
Np-237		6.4E + 05										
Pm-147		3.8E + 08										
Pu-238		1.0E + 07	6.7E+02									
Pu-239		6.7E + 06	2.5E+02									
Pu-240		1.5E + 06	2.5E+02									
Pu-241		6.4E + 07	5.6E+04									
Ra-226		4.7E + 05										
Ru-106		1.2E + 04										
Sb-125		9.3E + 06										
Sm-151		3.4E + 08										
Sr-90		3.5E + 12	2.2E+02	2.3E+01	2.1E+01		1.3E+01	2.9E+01	1.1E+01	2.6E+01	3.9E+01	3.6E+01
Tc-99		5.8E + 06										
Te-125m		2.3E + 06										
Th-228		1.6E + 04										
Th-230		1.4E + 04										
Th-232		1.7E + 04										

Table A-23. (continued).

	Selected ICDF WAC Concentration Guideline[a]		Remediation Goals (RGs) from ROD[b]	CPP 36 – 1 (mg/kg or pCi/g) Sample Depth (ft)					CPP 36 – 2 (mg/kg or pCi/g) Sample Depth (ft)			
Constituent[a]	(mg/kg)	(pCi/g)	(mg/kg or pCi/g)	3 - 6	3 - 6[z]	3 - 6[z]	6 - 8	8 - 10	4 -6	6 - 8	8 - 10	8 - 10[z]
U-233		1.6E + 08										
U-234		6.0E + 06										
U-235		1.1E + 05										
U-236		2.0E + 05										
U-238		2.0E + 06										
Y-90		2.3E + 10										

NOTES: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
z. Duplicate sample result

ND - Not Detected (concentration reported was below the detection limit)
NA - Not Applicable

J - The sample concentration reported is an estimated value as a result of data validation.

Table A-24. CPP-36 – transfer line leak from CPP-633.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 36 (mg/kg or pCi/g) Sample Depth - ft (sample #) 2 (A1)	2 (A2)	2 (A3)	2 (A4)	5 (A1)	5 (A3)	6 (A1)	6 (A2)	6 (A4)	9 (1)	9 (2)	9 (3)
Organics				NOT Analyzed											
Inorganics				NOT Analyzed											
Radionuclides															
Ag-108m		8.0E + 05													
Am-241		1.0E + 04	2.9E+02												
Am-243		3.3E + 02													
Ba-137m		NA													
C-14		3.0E + 03													
Cd-113m		1.6E + 06													
Ce-144		1.8E + 03													
Co-57		3.7E + 03													
Co-60		1.9E + 08													
Cs-134		1.1E + 07											3.8E-01	4.1E+01	8.7E+02
Cs-137		2.3E + 12	2.3E+01		6.2E+01	9.3E+01	2.7E+01	2.6E+01	3.4E+01	1.7E+02	3.8E+01	2.0E+02	7.5E+03	5.6E+05	5.2E+06
Eu-152		9.7E + 08	2.7E+02												
Eu-154		8.2E + 08	5.2E+03	6.9E+01									1.6E+02	5.0E+03	
Eu-155		1.8E + 08													
H-3		5.0E + 07													
I-129		3.1E + 03													
K-40		2.4E + 05													
Kr-85		NA													
Np-237		6.4E + 05													
Pm-147		3.8E + 08													
Pu-238		1.0E + 07	6.7E+02												
Pu-239		6.7E + 06	2.5E+02												
Pu-240		1.5E + 06	2.5E+02												
Pu-241		6.4E + 07	5.6E+04												
Ra-226		4.7E + 05													
Ru-106		1.2E + 04													
Sb-125		9.3E + 06													
Sm-151		3.4E + 08													
Sr-90		3.5E + 12	2.2E+02	2.2E+01	1.6E+01	2.8E+01	2.9E-01	7.4E+01	4.3E+01	5.4E+01	5.3E+00	3.9E+01	8.7E+02	1.5E+04	1.4E+05
Tc-99		5.8E + 06													
Te-125m		2.3E + 06													
Th-228		1.6E + 04													
Th-230		1.4E + 04													
Th-232		1.7E + 04													

Table A-24. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 36 (mg/kg or pCi/g) Sample Depth - ft (sample #) 2 (A1)	2 (A2)	2 (A3)	2 (A4)	5 (A1)	5 (A3)	6 (A1)	6 (A2)	6 (A4)	9 (1)	9 (2)	9 (3)
U-233		1.6E + 08													
U-234		6.0E + 06													
U-235		1.1E + 05													
U-236		2.0E + 05													
U-238		2.0E + 06													
Y-90		2.3E + 10													

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
NA - Not Applicable

Table A-25. CPP-37B – gravel pit and debris landfill inside INTEC fence.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 37B – 1 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA13001	CPP37B – 2 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA13201	CPP37B -3 Depth (ft) 2 – 10 (mg/kg or pCi/g) 3RA13401	CPP 37B - 4 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA13601	CPP37B – 5 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA13801	CPP37B -6 Depth (ft) 2 - 10 & Dup (mg/kg or pCi/g) 3RA14001
Organics				NOT Analyzed					
Inorganics									
Aluminum	1.6E + 05								
Antimony	5.8E + 03								
Arsenic	5.8E + 01								
Barium	3.0E + 03								
Beryllium	1.8E + 01								
Boron	3.3E + 03								
Cadmium	3.6E + 03								
Calcium	NA								
Chloride	3.3E + 04								
Chromium	4.1E + 04			2.3E+01	2.6E+01	1.9E+01	2.7E+01	2.2E+01	2.5E+01
Cobalt	1.1E + 02								
Copper	3.0E + 04								
Cyanide	3.4E + 02								
Dysprosium	5.9E + 04								
Fluoride	3.9E + 03								
Iron	2.4E + 05								
Lead	5.8E + 04								
Magnesium	1.2E + 05								
Manganese	4.9E + 03								
Mercury	9.5E + 03		2.3E+01	ND	ND	ND	ND	ND	2.0E-02
Molybdenum	1.0E + 04								
Nickel	3.5E + 02								
Nitrate	3.9E + 03								
Nitrate/Nitrite-N	3.3E + 04								
Nitrite	8.5E + 00								
Phosphate	3.30E+04								
Phosphorus	NA								
Potassium	4.3E + 04								
Selenium	8.5E + 02								
Silicon	3.30E+04								
Silver	9.8E + 03								
Sodium	3.2E + 03								
Strontium	1.8E + 04								
Sulfate	3.3E + 04								
Sulfide	3.3E + 04								
Terbium	NA								
Thallium	4.3E + 00								

Table A-25. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 37B – 1 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA13001	CPP37B – 2 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA13201	CPP37B -3 Depth (ft) 2 – 10 (mg/kg or pCi/g) 3RA13401	CPP 37B - 4 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA13601	CPP37B – 5 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA13801	CPP37B -6 Depth (ft) 2 - 10 & Dup (mg/kg or pCi/g) 3RA14001	
Tin	3.00E+03									
Vanadium	4.5E + 02									
Ytterbium	NA									
Zinc	2.1E + 05									
Zirconium	NA									
Radionuclides										
Ag-108m		8.0E + 05								
Am-241		1.0E + 04	2.9E+02	2.6E+00	1.2E-02	6.1E-01 J	ND	5.9E+00	ND	
Am-243		3.3E + 02								
Ba-137m		NA								
C-14		3.0E + 03								
Cd-113m		1.6E + 06								
Ce-144		1.8E + 03								
Co-57		3.7E + 03								
Co-60		1.9E + 08								
Cs-134		1.1E + 07								
Cs-137		2.3E + 12	2.3E+01	2.0E+00	3.5E-01	8.8E-01	2.4E+00	7.3E+00	7.3E-01	1.9E+00
Eu-152		9.7E + 08	2.7E+02							
Eu-154		8.2E + 08	5.2E+03							
Eu-155		1.8E + 08								
H-3		5.0E + 07		ND	ND	ND	ND	ND	ND	
I-129		3.1E + 03		ND	ND	ND	ND	ND	4.9E-01	
K-40		2.4E + 05								
Kr-85		NA								
Np-237		6.4E + 05		ND	ND	3.3E-01 J	ND	ND	ND	
Pm-147		3.8E + 08								
Pu-238		1.0E + 07	6.7E+02	ND	ND	6.1E-01 J	ND	ND	ND	
Pu-239[c]		6.7E + 06	2.5E+02	ND	ND	ND	ND	ND	ND	
Pu-240[c]		1.5E + 06	2.5E+02	ND	ND	ND	ND	ND	ND	
Pu-241		6.4E + 07	5.6E+04	1.0E+02	ND	2.5E+01 J	ND	2.4E+02	ND	
Ra-226		4.7E + 05								
Ru-106		1.2E + 04								
Sb-125		9.3E + 06								
Sm-151		3.4E + 08								
Sr-90		3.5E + 12	2.2E+02	1.6E+00	3.8E-01	4.1E-01	1.8E+00	1.7E+00	4.5E-01	
Tc-99		5.8E + 06		4.4E-01	4.4E-01	4.4E-01	4.4E-01	4.3E-01	4.4E-01	
Te-125m		2.3E + 06		ND	ND	ND	ND	ND	ND	
Th-228		1.6E + 04								
Th-230		1.4E + 04								
Th-232		1.7E + 04								
U-233		1.6E + 08								

Table A-25. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 37B – 1 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA13001	CPP37B – 2 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA13201	CPP37B -3 Depth (ft) 2 – 10 (mg/kg or pCi/g) 3RA13401	CPP 37B - 4 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA13601	CPP37B – 5 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA13801	CPP37B -6 Depth (ft) 2 - 10 & Dup (mg/kg or pCi/g) 3RA14001
U-234		6.0E + 06		ND	1.4E+00	9.9E+01	1.1E+00	1.1E+00 J	5.3E-01 J
U-235		1.1E + 05		ND	ND	ND	ND	ND	ND
U-236		2.0E + 05							
U-238		2.0E + 06		9.1E-01 J	9.8E-01 J	5.2E-01 J	7.6E-01 J	9.1E-01 J	1.0E+00
Y-90		2.3E + 10							

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

J - The sample concentration reported is an estimated value as a result of data validation.

Table A-26. CPP-37 – New site contamination area southeast of CPP-37B.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a]		Remediation Goals (RGs) from ROD[b]	CPP 37 – 6 Depth (ft) 2 - 10 (mg/kg or pCi/g)	CPP37 - 7 Depth (ft) 2 - 10 (mg/kg or pCi/g)		CPP37 – 8 Depth (ft) 2 - 10 (mg/kg or pCi/g)	CPP 37 – 9 Depth (ft) 2 - 10 (mg/kg or pCi/g)	CPP37 – 10 Depth (ft) 2 - 10 (mg/kg or pCi/g)	CPP37 – 11 Depth (ft) 2 - 10 (mg/kg or pCi/g)
	(mg/kg)	(pCi/g)	(mg/kg or pCi/g)	3RA14201	3RA14401	3RA14402	3RA14601	3RA14801	3RA15001	3RA15201
Organics							NOT Analyzed			
Inorganics										
Aluminum	1.6E + 05									
Antimony	5.8E + 03									
Arsenic	5.8E + 01									
Barium	3.0E + 03									
Beryllium	1.8E + 01									
Boron	3.3E + 03									
Cadmium	3.6E + 03									
Calcium	NA									
Chloride	3.3E + 04									
Chromium	4.1E + 04			2.6E+01	3.2E+01	2.2E+01	2.2E+01	2.3E+01	1.8E+01	2.2E+01
Cobalt	1.1E + 02									
Copper	3.0E + 04									
Cyanide	3.4E + 02									
Dysprosium	5.9E + 04									
Fluoride	3.9E + 03									
Iron	2.4E + 05									
Lead	5.8E + 04									
Magnesium	1.2E + 05									
Manganese	4.9E + 03									
Mercury	9.5E + 03		2.3E+01	ND	1.9E-02 J	1.4E-02 J	ND	ND	ND	ND
Molybdenum	1.0E + 04									
Nickel	3.5E + 02									
Nitrate	3.9E + 03									
Nitrate/Nitrite-N	3.3E + 04									
Nitrite	8.5E + 00									
Phosphate	3.30E+04									
Phosphorus	NA									
Potassium	4.3E + 04									
Selenium	8.5E + 02									
Silicon	3.30E+04									
Silver	9.8E + 03									
Sodium	3.2E + 03									
Strontium	1.8E + 04									
Sulfate	3.3E + 04									
Sulfide	3.3E + 04									
Terbium	NA									
Thallium	4.3E + 00									

Table A-26. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a]		Remediation Goals (RGs) from ROD[b]	CPP 37 – 6 Depth (ft) 2 - 10 (mg/kg or pCi/g)	CPP37 - 7 Depth (ft) 2 - 10 (mg/kg or pCi/g)		CPP37 – 8 Depth (ft) 2 - 10 (mg/kg or pCi/g)	CPP 37 – 9 Depth (ft) 2 - 10 (mg/kg or pCi/g)	CPP37 – 10 Depth (ft) 2 - 10 (mg/kg or pCi/g)	CPP37 – 11 Depth (ft) 2 - 10 (mg/kg or pCi/g)
	(mg/kg)	(pCi/g)	(mg/kg or pCi/g)	3RA14201	3RA14401	3RA14402	3RA14601	3RA14801	3RA15001	3RA15201
Tin	3.00E+03									
Vanadium	4.5E + 02									
Ytterbium	NA									
Zinc	2.1E + 05									
Zirconium	NA									
Radionuclides										
Ag-108m		8.0E + 05								
Am-241		1.0E + 04	2.9E+02	7.2E-01 J	ND	ND	ND	ND	ND	ND
Am-243		3.3E + 02								
Ba-137m		NA								
C-14		3.0E + 03								
Cd-113m		1.6E + 06								
Ce-144		1.8E + 03								
Co-57		3.7E + 03								
Co-60		1.9E + 08								
Cs-134		1.1E + 07								
Cs-137		2.3E + 12	2.3E+01	1.9E+01	1.3E+00	1.4E+00	1.5E+00	3.6E+00	ND	1.5E+00
Eu-152		9.7E + 08	2.7E+02							
Eu-154		8.2E + 08	5.2E+03							
Eu-155		1.8E + 08								
H-3		5.0E + 07		ND	ND	ND	ND	ND	1.1E-01	2.0E-02
I-129		3.1E + 03		ND	2.3E-01	5.4E-01	ND	ND	1.0E-01	0.0E+00
K-40		2.4E + 05								
Kr-85		NA								
Np-237		6.4E + 05		ND	ND	ND	ND	ND	ND	ND
Pm-147		3.8E + 08								
Pu-238		1.0E + 07	6.7E+02	ND	ND	ND	ND	ND	ND	ND
Pu-239[c]		6.7E + 06	2.5E+02	ND	6.0E-01 J	ND	ND	ND	ND	ND
Pu-240[c]		1.5E + 06	2.5E+02	ND	6.0E-01 J	ND	ND	ND	ND	ND
Pu-241		6.4E + 07	5.6E+04	2.9E+01 J	ND	ND	ND	ND	ND	ND
Ra-226		4.7E + 05								
Ru-106		1.2E + 04								
Sb-125		9.3E + 06								
Sm-151		3.4E + 08								
Sr-90		3.5E + 12	2.2E+02	3.8E-01	6.6E-01	5.2E-01	6.7E-01	3.4E+00	2.6E-01	1.0E-01
Tc-99		5.8E + 06		ND	ND	ND	ND	ND	ND	ND
Te-125m		2.3E + 06								
Th-228		1.6E + 04								
Th-230		1.4E + 04								
Th-232		1.7E + 04								
U-233		1.6E + 08								

Table A-26. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a]		Remediation Goals (RGs) from ROD[b]	CPP 37 – 6 Depth (ft) 2 - 10 (mg/kg or pCi/g)	CPP37 - 7 Depth (ft) 2 - 10 (mg/kg or pCi/g)		CPP37 – 8 Depth (ft) 2 - 10 (mg/kg or pCi/g)	CPP 37 – 9 Depth (ft) 2 - 10 (mg/kg or pCi/g)	CPP37 – 10 Depth (ft) 2 - 10 (mg/kg or pCi/g)	CPP37 – 11 Depth (ft) 2 - 10 (mg/kg or pCi/g)
	(mg/kg)	(pCi/g)	(mg/kg or pCi/g)	3RA14201	3RA14401	3RA14402	3RA14601	3RA14801	3RA15001	3RA15201
U-234		6.0E + 06		1.1E+00	1.1E+00	1.3E+00	1.1E+00	6.6E-01 J	5.8E-01 J	1.3E+00 J
U-235		1.1E + 05		ND	ND	ND	ND	ND	ND	ND
U-236		2.0E + 05								
U-238		2.0E + 06		1.0E+00	8.6E-01 J	1.1E+00	8.8E-01 J	8.9E-01 J	1.1E+00	6.4E-01 J
Y-90		2.3E + 10								

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

J - The sample concentration reported is an estimated value as a result of data validation.

Table A-27. CPP-37C – new site contamination area southeast of CPP-37B.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 37C - 12 Depth (ft) 2 – 10 (mg/kg or pCi/g) 3RA15401	CPP37C – 13 Depth (ft) 2 – 10 (mg/kg or pCi/g) 3RA15601	CPP37C – 14 Depth (ft) 2 – 10 (mg/kg or pCi/g) 3RA15801	CPP 37C – 15 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA16001	CPP37C – 16 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA16201
Organics				Not Analyzed				
Inorganics								
Aluminum	1.6E + 05							
Antimony	5.8E + 03							
Arsenic	5.8E + 01							
Barium	3.0E + 03							
Beryllium	1.8E + 01							
Boron	3.3E + 03							
Cadmium	3.6E + 03							
Calcium	NA							
Chloride	3.3E + 04							
Chromium	4.1E + 04			2.2E+01	1.4E+01	2.3E+01	2.5E+01	2.4E+01
Cobalt	1.1E + 02							
Copper	3.0E + 04							
Cyanide	3.4E + 02							
Dysprosium	5.9E + 04							
Fluoride	3.9E + 03							
Iron	2.4E + 05							
Lead	5.8E + 04							
Magnesium	1.2E + 05							
Manganese	4.9E + 03							
Mercury	9.5E + 03		2.3E+01	ND	ND	ND	ND	ND
Molybdenum	1.0E + 04							
Nickel	3.5E + 02							
Nitrate	3.9E + 03							
Nitrate/Nitrite-N	3.3E + 04							
Nitrite	8.5E + 00							
Phosphate	3.30E+04							
Phosphorus	NA							
Potassium	4.3E + 04							
Selenium	8.5E + 02							
Silicon	3.30E+04							
Silver	9.8E + 03							
Sodium	3.2E + 03							
Strontium	1.8E + 04							
Sulfate	3.3E + 04							
Sulfide	3.3E + 04							
Terbium	NA							
Thallium	4.3E + 00							
Tin	3.00E+03							

Table A-27. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 37C - 12 Depth (ft) 2 – 10 (mg/kg or pCi/g) 3RA15401	CPP37C – 13 Depth (ft) 2 – 10 (mg/kg or pCi/g) 3RA15601	CPP37C – 14 Depth (ft) 2 – 10 (mg/kg or pCi/g) 3RA15801	CPP 37C – 15 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA16001	CPP37C – 16 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA16201
Vanadium	4.5E + 02							
Ytterbium	NA							
Zinc	2.1E + 05							
Zirconium	NA							
Radionuclides								
Ag-108m		8.0E + 05						
Am-241		1.0E + 04	2.9E+02	ND	9.5E-01	ND	ND	ND
Am-243		3.3E + 02						
Ba-137m		NA						
C-14		3.0E + 03						
Cd-113m		1.6E + 06						
Ce-144		1.8E + 03						
Co-57		3.7E + 03						
Co-60		1.9E + 08						
Cs-134		1.1E + 07						
Cs-137		2.3E + 12	2.3E+01	8.5E-01	ND	2.5E+00	9.6E-01	2.9E+00
Eu-152		9.7E + 08	2.7E+02					
Eu-154		8.2E + 08	5.2E+03					
Eu-155		1.8E + 08						
H-3		5.0E + 07		1.0E-01	ND	ND	ND	ND
I-129		3.1E + 03		2.3E-01	ND	ND	ND	6.1E-01 J
K-40		2.4E + 05						
Kr-85		NA						
Np-237		6.4E + 05		ND	ND	ND	ND	ND
Pm-147		3.8E + 08						
Pu-238		1.0E + 07	6.7E+02	ND	ND	4.9E-01 J	5.3E-01 J	ND
Pu-239		6.7E + 06	2.5E+02	ND	ND	4.4E-01 J	ND	5.9E-01 J
Pu-240		1.5E + 06	2.5E+02	ND	ND	4.4E-01 J	ND	5.9E-01 J
Pu-241		6.4E + 07	5.6E+04	ND	3.80E+01	ND	ND	ND
Ra-226		4.7E + 05						
Ru-106		1.2E + 04						
Sb-125		9.3E + 06						
Sm-151		3.4E + 08						
Sr-90		3.5E + 12	2.2E+02	8.9E-01	ND	4.6E+00	7.1E-01	6.2E-01
Tc-99		5.8E + 06		4.4E-01	4.3E-01	4.4E-01	4.3E-01	4.4E-01
Te-125m		2.3E + 06						
Th-228		1.6E + 04						
Th-230		1.4E + 04						
Th-232		1.7E + 04						

Table A-27. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 37C - 12 Depth (ft) 2 – 10 (mg/kg or pCi/g) 3RA15401	CPP37C – 13 Depth (ft) 2 – 10 (mg/kg or pCi/g) 3RA15601	CPP37C – 14 Depth (ft) 2 – 10 (mg/kg or pCi/g) 3RA15801	CPP 37C – 15 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA16001	CPP37C – 16 Depth (ft) 2 - 10 (mg/kg or pCi/g) 3RA16201
U-233		1.6E + 08						
U-234		6.0E + 06		ND	1.1E+00	8.3E-01 J	6.1E-01 J	ND
U-235		1.1E + 05		ND	ND	ND	ND	ND
U-236		2.0E + 05						
U-238		2.0E + 06		8.9E-01 J	9.7E-01	5.8E-01 J	1.9E+00	7.2E-01 J
Y-90		2.3E + 10						

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum detection limit)
NA - Not Applicable

J - The sample concentration reported is an estimated value as a result of data validation.

Table A-28. CPP-41A – fire training pits between CPP-666 and CPP-663.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-41A (mg/kg or pCi/g) Sample Number 101	201	301	401	501	502[z]	601	701	801
Organics												
1,1,1-Trichloroethane	1.6E + 01			ND	ND	ND	ND	ND	ND		ND	ND
1,1,1,2-Tetrachloroethane				ND	ND	ND	ND	ND	ND		ND	ND
1,1,2,2-Tetrachloroethane	5.0E - 02			ND	ND	ND	ND	ND	ND		ND	ND
1,1,2-Trichloroethane	2.4E - 01			ND	ND	ND	ND	ND	ND		ND	ND
1,1-Dichloroethane	2.3E + 00			ND	ND	ND	ND	ND	ND		ND	ND
1,1-Dichloroethene	1.5E + 00			ND	ND	ND	ND	ND	ND		ND	ND
1-Naphthylamine				ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane				ND	ND	ND	ND	ND	ND		ND	ND
1,2-Dibromoethane				ND	ND	ND	ND	ND	ND		ND	ND
1,2-Dibromo-3-chloropropane				ND	ND	ND	ND	ND	ND		ND	ND
1,2-Dichlorobenzene	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	5.4E - 03			ND	ND	ND	ND	ND	ND		ND	ND
1,2-Dichloroethene (total)	3.2E - 01											
1,2-Dichloropropane				ND	ND	ND	ND	ND	ND		ND	ND
1,2,4,5-Tetrachlorobezene				ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trinitrobenzene				ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dinitrobenzene					ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	4.4E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dioxane	1.9E - 02											
1,4-Phenylenediamine												
1,4-Naphthoquinone				ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2'-Oxbyis(1-chloropropane)				ND	ND	ND	ND	ND	ND	ND	ND	ND
2,3,4,6-Tetrachlorophenol				ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	4.5E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	1.8E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dichlorophenol	2.2E + 01			ND	ND	ND	ND	ND	ND		ND	ND
2,4-Dimethylphenol	1.8E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrophenol	5.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dichlorophenol				ND	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	2.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Acetylaminofluorene				ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Amino-4-nitrotoluene				ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	2.5E + 01			ND	ND	ND	ND	ND	ND		ND	ND
2-Chloronaphthalene	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	1.8E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	2.7E + 00			ND	ND	ND	ND	ND	ND		ND	ND
2-Methylnaphthalene	5.1E + 02			ND	ND	ND	ND	ND	4.3E-02 J	ND	ND	ND
2-Methylphenol	2.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND

Table A-28. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-41A (mg/kg or pCi/g) Sample Number 101	201	301	401	501	502[z]	601	701	801
2-Naphthylamine				ND	ND	ND	ND	ND	ND	ND		ND
2-Nitroaniline	1.0E - 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrophenol	1.8E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Picoline				ND	ND	ND	ND	ND	ND	ND	ND	ND
2-sec-Butyl-4,6-dinitrophenol				ND	ND	ND	ND	ND	ND	ND	ND	ND
3,3'-Dichlorobenzidine	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
3,3'-Dimethylbenzidine				ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Methyl Butanal	3.3E + 04											
3-Methylcholanthrene				ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Nitroaniline	1.0E - 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
4,6-Dinitro-2-methylphenol	4.5E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Aminobiphenyl				ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Bromophenyl-phenylether	8.5E + 04			ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol	9.6E + 04			ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloroaniline	4.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorophenyl-phenylether	1.0E + 05			ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Dimethylaminoazobenzene				ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	3.0E + 01			ND	ND	ND	ND	ND	ND		ND	ND
4-Methylphenol	3.9E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	1.0E - 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitrophenol	5.2E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroquinoline-1-oxide				ND	ND	ND	ND	ND	ND	ND	ND	ND
7,12-Dimethylbenz(a)anthracene				ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	2.0E + 02			ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	2.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	4.9E + 01			9.9E-02 B	4.1E-02 B	ND	5.6E-02 J	6.2E-02 J	6.6E-02 B		ND	9.6E-02 B
Acetonitrile	1.2E + 00											
Acetophenone				ND	ND	ND	ND	ND	ND	ND	ND	ND
Acrolein	5.5E - 01											
Acrylonitrile	5.8E - 01			ND	ND	ND	ND	ND	ND		ND	ND
Allyl chloride				ND	ND	ND	ND	ND	ND		ND	ND
alpha,alpha-Dimethylphenethylamine				ND	ND	ND	ND	ND	ND	ND	ND	ND
Aniline				ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	3.2E + 02			ND	ND	ND	ND	ND	4.4E-02 J	ND	ND	ND
Aramite (peak 1)				ND	ND	ND	ND	ND	ND	ND	ND	ND
Aramite (peak 2)				ND	ND	ND	ND	ND	ND	ND	ND	ND
Aramite	6.7E + 00											
Aroclor-1016	7.7E + 00											
Aroclor-1254	1.3E + 02											
Aroclor-1260	5.0E + 02											
Aroclor-1268	6.2E + 01											
Azobenzene				ND	ND	ND	ND	ND	ND	ND	ND	ND

Table A-28. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-41A (mg/kg or pCi/g) Sample Number 101	201	301	401	501	502[z]	601	701	801
Benzene	2.2E + 02			ND	ND	ND	ND	ND	ND		ND	ND
Benzyl alcohol				ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzidine	1.7E + 01											
Benzo(a)anthracene	2.5E + 02			ND	ND	1.5E-01 J	4.5E-02 J	2.0E-01 J	2.6E-01 J	ND	1.3E-01 J	ND
Benzo(a)pyrene	1.1E + 02			ND	ND	8.1E-02 J	3.8E-02 J	1.5E-01 J	1.2E-01 J	ND	7.8E-02 J	ND
Benzo(b)fluoranthene	1.8E + 02			ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	1.9E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzoic acid	8.6E + 00			ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Chloroethoxy)methane	1.6E + 02			ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Chloroethyl)ether	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Chloroisopropyl)ether	1.1E + 01											
bis(2-Ethylhexyl)phthalate	1.5E + 02			ND	ND	ND	ND	ND	4.9E-02 J	1.1E-01 J	ND	ND
Bromoform	5.0E + 02			ND	ND	ND	ND	ND	ND		ND	ND
Bromomethane	5.0E + 02			ND	ND	ND	ND	ND	ND		ND	ND
Bromodichloromethane				ND	ND	ND	ND	ND	ND		ND	ND
Butane,1,1,3,4-Tetrachloro-	1.0E + 05											
Butylbenzylphthalate	6.8E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbazole	3.2E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	4.6E + 01			ND	ND	ND	ND	ND	ND		ND	ND
Carbon tetrachloride	5.0E + 02			ND	ND	ND	ND	ND	ND		ND	ND
Chlorobenzene	6.6E + 00			ND	ND	ND	ND	ND	ND		ND	ND
Chlorodibromomthane				ND	ND	ND	ND	ND	ND		ND	ND
Chloroethane	1.5E - 01			ND	ND	ND	ND	ND	ND		ND	ND
Chloroform	2.8E + 02			ND	ND	ND	ND	ND	ND		ND	ND
Chloromethane	3.5E - 01			ND	ND	ND	ND	ND	ND		ND	ND
Chloroprene				ND	ND	ND	ND	ND	ND		ND	ND
Chrysene	2.7E + 02			ND	ND	2.7E-01 J	8.2E-02 J	4.0E-01	4.90E-01	3.7E-02 J	2.7E-01 J	ND
cis-1,2-Dichloroethene					ND	ND	ND	ND	ND			ND
cis-1,3-Dichloroethene				ND							ND	
cis-1,3-Dichloropropene				ND	ND	ND	ND	ND	ND		ND	ND
Decane, 3,4-Dimethyl	3.3E + 04											
Diacetone alcohol	1.0E + 05											
Dibenz(a,h)anthracene	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	3.2E + 02			ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane				ND	ND	ND	ND	ND	ND		ND	ND
Dichlorodifluoromethane	4.0E + 02			ND	ND	ND	ND	ND	ND		ND	ND
Diethylphthalate	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl Disulfide	3.3E + 04											
Dimethylphthalate	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butylphthalate	2.4E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate	2.6E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND

Table A-28. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-41A (mg/kg or pCi/g) Sample Number 101	201	301	401	501	502[z]	601	701	801
Eicosane	1.0E + 05											
Ethyl cyanide	3.3E + 04											
Ethylbenzene	7.8E + 01			ND	ND	ND	ND	ND	ND		ND	ND
Ethyl methacrylate				ND	ND	ND	ND	ND	ND		ND	ND
Ethyl methanesulfonate				ND	ND	ND	ND	ND	ND	ND	ND	ND
Famphur	1.0E + 05			ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	7.6E + 02			ND	ND	5.4E-02 J	ND	ND	4.0E-02 J	ND	ND	ND
Fluorene	1.8E + 02			ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptadecane, 2,6,10,15-Tetra	3.3E + 04											
Hexachlorobenzene	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	2.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachloroethane	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorophene												
Hexachloropropene				ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	1.1E + 01			ND	ND	ND	ND	ND		ND	ND	ND
Iodomethane				ND	ND	ND	ND	ND	ND		ND	ND
Isobutyl alcohol	1.2E + 00											
Isophorone	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropyl Alcohol/2-propanol	1.0E + 05											
Isosafrole				ND	ND	ND	ND	ND	ND	ND	ND	ND
Kepone	9.9E + 01											
Mesityl oxide	1.0E + 05											
Methapyrilene				ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Acetate	4.8E - 01											
Methylacrylonitrile				ND	ND	ND	ND	ND	ND		ND	ND
Methyl methacrylate				ND	ND	ND	ND	ND	ND		ND	ND
Methyl methanesulfonate				ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	2.7E + 01			ND	3.0E-03 J	ND	3.0E-03 J	5.0E-03 J	1.4E+01		9.0E-03	4.0E-03 J
Naphthalene	4.3E + 02			ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrobenzene	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitroso-di-n-butylamine				ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodiethylamine				ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodimethylamine					ND	ND	ND	ND	ND	ND	ND	ND
N-Nitroso-di-n-dipropylamine	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine	1.1E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosopyrrolidine				ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosomethylethylamine				ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosomorpholine				ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosopiperidine				ND		ND	ND	ND	ND	ND	ND	ND
Octane,2,3,7-Trimethyl	3.3E + 04											
O,O,O-Triethyl phosphorothioate				ND	ND	ND	ND	ND	ND	ND	ND	ND

Table A-28. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-41A (mg/kg or pCi/g) Sample Number 101	201	301	401	501	502[z]	601	701	801
o-Toluenesulfonamide	3.3E + 04											
o-Toluidine				ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachloroethane				ND	ND	ND	ND	ND	ND		ND	ND
Pentachloronitrobenzene				ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorobenzene				ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	5.6E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenacetin				ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	1.2E + 03			ND	ND	1.3E-01 J	ND	8.2E-02 J	1.2E-01 J	ND	1.0E-01 J	ND
Phenol	8.0E + 01			ND	ND	ND	3.6E-02 J	ND	ND	ND	ND	ND
Phenol,2,6-Bis(1,1-Dimethyl)	1.0E + 05											
p-Toluenesulfonamide	3.3E + 04											
Pronamide				ND	ND	ND	ND	ND	ND	ND	ND	ND
Propionitrile												
Pyrene	2.5E + 02			ND	ND	1.8E-01 J	1.7E-01 J	1.9E-01 J	2.5E-01 J	3.7E-02 J	1.6E-01 J	ND
Pryridine	5.0E + 02			ND	ND	ND	ND	ND	ND	ND	ND	ND
RDX	1.0E + 01											
Safrole				ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	6.1E - 02			ND	ND	ND	ND	ND	ND		ND	ND
Tetrachloroethene	9.6E + 00			ND	ND	ND	ND	ND	ND		ND	ND
Thionazin				ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	3.0E + 01			ND	ND	ND	ND	2.0E-03 J	1.5E-02		ND	ND
trans- 1,2-Dichloroethene					ND	ND	ND	ND	ND		ND	ND
trans- 1,3-Dichloroethene				ND								
trans- 1,3-Dichloropropene				ND	ND	ND	ND	ND	ND		ND	ND
trans-1,4-Dichloro-2-butene				ND	ND	ND	ND	ND	ND		ND	ND
Tributylphosphate	4.8E + 02											
Trichloroethene	3.1E + 01			ND	ND	ND	ND	ND	ND		ND	ND
Trichlorofluoromethane	5.0E + 02			ND	ND	ND	ND	ND	ND		ND	ND
Trinitrotoluene	1.1E + 01											
Undecane,4,6-Dimethyl-	3.3E + 02											
Vinyl acetate				ND	ND	ND	ND	ND	ND		ND	ND
Vinyl chloride	2.5E + 02			ND	ND	ND	ND	ND	ND		ND	ND
Xylene, meta &/or para isomers				ND	ND	ND	ND	ND	3.0E-03 J		ND	ND
Xylene (ortho)	3.9E + 00			ND	ND	ND	ND	ND	ND		ND	ND
Xylene (total)	2.8E + 02											
Inorganics												
Aluminum	1.6E + 05			6.1E+03	4.8E+03	4.4E+03	4.7E+03	4.0E+03	4.2E+03	5.6E+03	6.5E+03	4.8E+03
Antimony	5.8E + 03			ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	5.8E + 01			3.3E+00 J	3.7E+00 J	3.4E+00 J	4.3E+00 J	3.3E+00 J	4.0E+00 J	3.3E+00 J	3.5E+00 J	3.6E+00 J
Barium	3.0E + 03			1.2E+02 J	1.3E+02 J	8.9E+01 J	1.1E+02 J	8.8E+01 J	9.7E+01 J	1.3E+02 J	1.5E+02 J	1.3E+02 J

Table A-28. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-41A (mg/kg or pCi/g) Sample Number 101	201	301	401	501	502[z]	601	701	801
Beryllium	1.8E + 01			5.3E-01 B	4.5E-01 B	4.7E-01 B	4.5E-01 B	3.8E-01 B	4.4E-01 B	5.2E-01 B	6.5E-01 B	5.0E-01 B
Boron	3.3E + 03											
Cadmium	3.6E + 03			ND	ND	ND	ND	ND	ND	ND	4.6E-01 B	3.8E-01 B
Calcium	NA											
Chloride	3.3E + 04											
Chromium	4.1E + 04			1.4E+01 J	1.4E+01 J	1.1E+01 J	1.1E+01 J	1.1E+01 J	1.0E+01 J	1.4E+01 J	1.5E+01 J	1.2E_01 J
Cobalt	1.1E + 02			4.4E+00 B	3.9E+00 B	3.9E+00 B	3.6E+00 B	3.1E+00 B	3.5E+00 B	4.4E+00 B	4.9E+00 B	3.5E+00 B
Copper	3.0E + 04			1.4E+01 J	1.9E+01 J	1.2E+01 J	1.7E+01 J	1.0E+01 J	1.1E+01 J	1.1E+01 J	1.4E+01 J	1.5E+01 J
Cyanide	3.4E + 02											
Dysprosium	5.9E + 04											
Fluoride	3.9E + 03											
Iron	2.4E + 05			1.1E+04	1.0E+04	9.6E+03	9.2E+03	8.0E+03	9.0E+03	1.1E+04	1.2E+04	9.8E+03
Lead	5.8E + 04			8.1E+00	7.4E+00	7.7E+00	1.9E+01	8.6E+00	6.3E+00	1.2E+01	7.6E+00	1.0E+01
Magnesium	1.2E + 05			5.1E+03	3.9E+03	4.0E+03	3.7E+03	3.5E+03	3.6E+03	5.0E+03	5.1E+03	5.7E+03
Manganese	4.9E + 03			1.9E+02 J	1.7E+02 J	1.7E+02 J	1.5E+02 J	1.5E+02 J	1.6E+02 J	2.0E+02 J	2.3E+02 J	1.6E+02 J
Mercury	9.5E + 03		2.3E+01	1.7E-01 B	ND	2.7E-01 B	ND	2.6E-01 B	1.7E-01 B	9.0E-02 B	ND	ND
Molybdenum	1.0E + 04											
Nickel	3.5E + 02			1.7E+01 B	1.5E+01 B	1.5E+01 B	1.4E+01 B	1.3E+01 B	1.3E+01 B	1.7E+01 B	2.0E+01	1.4E+01 B
Nitrate	3.9E + 03											
Nitrate/Nitrite-N	3.3E + 04											
Nitrite	8.5E + 00											
Phosphate	3.30E+04											
Phosphorus	NA											
Potassium	4.3E + 04			1.0E+03 J	9.1E+02 B J	7.4E+02 B J	8.0E+02 B J	8.1E+02 B J	7.3E+02 B J	9.1E+02 B J	1.1E+03 J	8.5E+02 J
Selenium	8.5E + 02			ND	ND	ND	ND	ND	ND	ND	ND	ND
Silicon	3.30E+04											
Silver	9.8E + 03			ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	3.2E + 03			2.2E+02 B	3.6E+02 B	2.8E+02 B	3.2E+02 B	3.2E+02 B	3.7E+02 B	4.1E+02 B	3.7E+02 B	3.1E+02 B
Strontium	1.8E + 04											
Sulfate	3.3E + 04											
Sulfide	3.3E + 04											
Terbium	NA											
Thallium	4.3E + 00			ND	ND	ND	ND	ND	ND	ND	ND	ND
Tin	3.00E+03											
Vanadium	4.5E + 02			1.7E+01	1.5E+01	1.5E+01	1.4E+01	1.5E+01	1.4E+01	1.6E+01	1.7E+01	1.5E+01
Ytterbium	NA											
Zinc	2.1E + 05			6.2E+01 J	4.8E+01 J	4.9E+01 J	4.5E+01 B J	4.8E+01 J	4.7E+01 J	5.8E+01 J	7.1E+01 J	5.1E+01 J
Zirconium	NA											

Table A-28. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-41A (mg/kg or pCi/g) Sample Number 101	201	301	401	501	502[z]	601	701	801
Radionuclides												
Ag-108m		8.0E + 05		ND	ND	ND	ND	ND	ND	ND	ND	ND
Ag-110m		NA		ND	ND	ND	ND	ND	ND	ND	ND	ND
Am-241		1.0E + 04	2.9E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND
Am-243		3.3E + 02										
Ba-137m		NA										
C-14		3.0E + 03										
Cd-113m		1.6E + 06										
Ce-144		1.8E + 03		ND	ND	ND	ND	ND	ND	ND	ND	ND
Co-57		3.7E + 03										
Co-58		NA		ND	ND	ND	ND	ND	ND	ND	ND	ND
Co-60		1.9E + 08		ND	ND	ND	ND	ND	ND	ND	ND	ND
Cs-134		1.1E + 07		ND	ND	ND	ND	ND	9.2E-02	ND	ND	ND
Cs-137		2.3E + 12	2.3E+01	1.0E+01 J	9.1E+00 J	8.5E+00 J	1.3E+01 J	1.0E+01 J	1.4E+01 J	1.3E+01 J	4.2E+00 J	5.4E+00 J
Eu-152		9.7E + 08	2.7E+02	ND	ND	ND	ND	ND	ND	ND	ND	ND
Eu-154		8.2E + 08	5.2E+03	ND	ND	ND	ND	ND	ND	ND	ND	ND
Eu-155		1.8E + 08		ND	ND	ND	ND	ND	ND	ND	ND	ND
H-3		5.0E + 07										
I-129		3.1E + 03										
K-40		2.4E + 05										
Kr-85		NA										
Mn-54		NA		ND	ND	ND	ND	ND	ND	ND	ND	ND
Nb-95		NA		ND	ND	ND	ND	ND	ND	ND	ND	ND
Np-237		6.4E + 05										
Pm-147		3.8E + 08										
Pu-238		1.0E + 07	6.7E+02									
Pu-239		6.7E + 06	2.5E+02									
Pu-240		1.5E + 06	2.5E+02									
Pu-241		6.4E + 07	5.6E+04									
Ra-226		4.7E + 05		4.0E+00 J	ND	3.2E+00 J	2.9E+00 J	1.9E+00 J	2.6E+00 J	ND	2.3E+00 J	2.2E+00 J
Ru-103		NA		ND	ND	ND	ND	ND	ND	ND	ND	ND
Ru-106		1.2E + 04		ND	ND	ND	ND	ND	ND	ND	ND	ND
Sb-125		9.3E + 06		ND	ND	ND	ND	ND	ND	ND	ND	ND
Sm-151		3.4E + 08										
Sr-90		3.5E + 12	2.2E+02	1.5E+01	1.5E+01							
Tc-99		5.8E + 06										
Te-125m		2.3E + 06										
Th-228		1.6E + 04										
Th-230		1.4E + 04										
Th-232		1.7E + 04										

Table A-28. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-41A (mg/kg or pCi/g) Sample Number 101	201	301	401	501	502[z]	601	701	801
U-233		1.6E + 08										
U-234		6.0E + 06										
U-235		1.1E + 05		ND	ND	ND	ND	ND	ND	ND	ND	ND
U-236		2.0E + 05										
U-238		2.0E + 06										
Y-90		2.3E + 10										
Zn-65		NA		ND	ND		ND	ND	ND	ND	ND	ND
Zr-95		NA		ND	ND	ND	ND	ND	ND	ND	ND	ND

NOTES: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill (**BOLD** - Indicates not in WAC)
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
z. Duplicate sample result

ND - Not Detected (concentration reported was below the detection limit)
NA - Not Applicable

B - Sample result is greater than the instrument detection limit, but less than the contract required detection limit.
J - The sample concentration reported is an estimated value as a result of data validation.

Table A-29. CPP-44 – grease pit south of Building CPP-608.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 44 (mg/kg or pCi/g) Sample Depth (ft) 0 - 2 (501)	2- 4 (601)	4 - 6 (701)	6 - 8 (801)	8 - 10 (101)	8 - 10 (102)[z]
Organics									
1,1,1-Trichloroethane	1.6E + 01								5.0E-03 J
Inorganics									
Aluminum	1.6E + 05								
Antimony	5.8E + 03			ND	6.6E-01 BJ	ND	ND	7.1E-01 BJ	1.9E+00 BJ
Arsenic	5.8E + 01				5.5E+00 BJ	2.1E+00 J	2.3E+00 J	7.1E+00 J	6.3E+00 BJ
Barium	3.0E + 03								
Beryllium	1.8E + 01			1.6E+00	1.3E+00	ND	8.8E-01	ND	8.9E-01
Boron	3.3E + 03								
Cadmium	3.6E + 03			6.3E+00 J	5.0E+00 J	1.6E+00 J	2.3E+00 J	8.4E+00 J	6.1E+00 J
Calcium	NA								
Chloride	3.3E + 04								
Chromium	4.1E + 04			9.0E+01 J	3.2E+02 J	2.9E+01 J	1.8E+02 J	9.4E+02 J	1.5E+03 J
Cobalt	1.1E + 02								
Copper	3.0E + 04			3.2E+01 J	2.8E+01 J	1.9E+01 J	1.7E+01 J	1.9E+01 J	4.8E+01 J
Cyanide	3.4E + 02								
Dysprosium	5.9E + 04								
Fluoride	3.9E + 03								
Iron	2.4E + 05								
Lead	5.8E + 04			2.8E+02 J	8.9E+00 J	1.1E+01 J	1.0E+01 J	4.7E+01	1.6E+02
Magnesium	1.2E + 05								
Manganese	4.9E + 03								
Mercury	9.5E + 03		2.3E+01	1.5E+00	1.3E+00	2.6E-01	2.8E+00	3.7E+00	5.0E+00
Molybdenum	1.0E + 04								
Nickel	3.5E + 02			2.1E+02 J	3.4E+02 J	3.5E+01 J	9.4E+01 J	1.3E+02 J	1.1E+02 J
Nitrate	3.9E + 03								
Nitrate/Nitrite-N	3.3E + 04								
Nitrite	8.5E + 00								
Phosphate	3.30E+04								
Phosphorus	NA								
Potassium	4.3E + 04								
Selenium	8.5E + 02			ND	2.2E+00 J	ND	ND	1.5E-01 BJ	ND
Silicon	3.30E+04								
Silver	9.8E + 03			ND	ND	ND	ND	ND	ND
Sodium	3.2E + 03								
Strontium	1.8E + 04								
Sulfate	3.3E + 04								
Sulfide	3.3E + 04								
Terbium	NA								

Table A-29. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 44 (mg/kg or pCi/g) Sample Depth (ft) 0 - 2 (501)	2- 4 (601)	4 - 6 (701)	6 - 8 (801)	8 - 10 (101)	8 - 10 (102)[z]
Thallium	4.3E + 00			4.7E-01 BJ	4.3E-01 B	1.1E-01 BJ	ND	ND	ND
Tin	3.00E+03								
Vanadium	4.5E + 02								
Ytterbium	NA								
Zinc	2.1E + 05			7.5E+01 J	5.3E+01 J	6.5E+01 J	5.3E+01 J	4.0E+01 J	1.2E+02 J
Zirconium	NA								
Radionuclides				NOT Analyzed					

NOTES: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
z. Duplicate sample result

ND - Not Detected (concentration reported was below the detection limit)
NA - Not Applicable

B - Sample result is greater than the instrument detection limit, but less than the contract required detection limit.
J - The sample concentration reported is an estimated value as a result of data validation.

Table A-30. CPP-48 – express chemical French drain.

	Selected ICDF WAC Concentration Guideline[a]		Remediation Goals (RGs) from ROD[b]	CPP-48 – 1 – 10 (mg/kg or pCi/g)		CPP-48 (1993) (mg/kg or pCi/g)	
Constituent[a]	(mg/kg)	(pCi/g)	(mg/kg or pCi/g)	10'	10[z]	101	201
Organics							
1,1,1-Trichloroethane	1.6E + 01						
1,1,2,2-Tetrachloroethane	5.0E - 02						
1,1,2-Trichloroethane	2.4E - 01						
1,1-Dichloroethane	2.3E + 00			5.7E-02	5.6E-02		
1,1-Dichloroethene	1.5E + 00						
1,2,4-Trichlorobenzene	1.1E + 01			3.6E+00	2.7E+00		
1,2-Dichlorobenzene	1.1E + 01						
1,2-Dichloroethane	5.4E - 03						
1,2-Dichloroethene (total)	3.2E - 01						
1,3-Dichlorobenzene	1.1E + 01						
1,4-Dichlorobenzene	4.4E + 01			3.2E+00	2.5E+00		
1,4-Dioxane	1.9E - 02						
2,4,5-Trichlorophenol	4.5E + 01						
2,4,6-Trichlorophenol	1.8E + 01						
2,4-Dichlorophenol	2.2E + 01						
2,4-Dimethylphenol	1.8E + 01						
2,4-Dinitrophenol	5.1E + 01						
2,4-Dinitrotoluene	1.1E + 01			3.6E+00	2.7E+00		
2,6-Dinitrotoluene	2.1E + 01						
2-Butanone	2.5E + 01						
2-Chloronaphthalene	1.1E + 01						
2-Chlorophenol	1.8E + 01			6.9E+00	5.6E+00		
2-Hexanone	2.7E + 00						
2-Methylnaphthalene	5.1E + 02						
2-Methylphenol	2.1E + 01						
2-Nitroaniline	1.0E - 01						
2-Nitrophenol	1.8E + 01						
3,3-Dichlorobenzidine	1.1E + 01						
3-Methyl Butanal	3.3E + 04						
3-Nitroaniline	1.0E - 01						
4,6-Dinitro-2-methylphenol	4.5E + 01						
4-Bromophenyl-phenylether	8.5E + 04						
4-Chloro-3-methylphenol	9.6E + 04			6.8E+00	5.5E+00		
4-Chloroaniline	4.1E + 01						
4-Chlorophenyl-phenylether	1.0E + 05						
4-Methyl-2-Pentanone	3.0E + 01						
4-Methylphenol	3.9E + 01						

Table A-30. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-48 – 1 – 10 (mg/kg or pCi/g) 10'	10^{z}	CPP-48 (1993) (mg/kg or pCi/g) 101	201
4-Nitroaniline	1.0E - 01						
4-Nitrophenol	5.2E + 01			7.4E+00	5.9E+00		
Acenaphthene	2.0E + 02			3.8E+00	3.0E+00		
Acenaphthylene	2.1E + 01						
Acetone	4.9E + 01						
Acetonitrile	1.2E + 00						
Acrolein	5.5E - 01						
Acrylonitrile	5.8E - 01						
Anthracene	3.2E + 02						
Aramite	6.7E + 00						
Aroclor-1016	7.7E + 00						
Aroclor-1254	1.3E + 02						
Aroclor-1260	5.0E + 02						
Aroclor-1268	6.2E + 01						
Benzene	2.2E + 02			5.2E-02	4.9E-02		
Benzidine	1.7E + 01						
Benzo(a)anthracene	2.5E + 02						
Benzo(a)pyrene	1.1E + 02						
Benzo(b)fluoranthene	1.8E + 02						
Benzo(g,h,i)perylene	1.1E + 01						
Benzo(k)fluoranthene	1.9E + 01						
Benzoic acid	8.6E + 00						
bis(2-Chloroethoxy)methane	1.6E + 02						
bis(2-Chloroethyl)ether	1.1E + 01						
bis(2-Chloroisopropyl)ether	1.1E + 01						
bis(2-Ethylhexyl)phthalate	1.5E + 02						
Butane,1,1,3,4-Tetrachloro-	1.0E + 05						
Butylbenzylphthalate	6.8E + 01						
Carbazole	3.2E + 01						
Carbon Disulfide	4.6E + 01						
Chlorobenzene	6.6E + 00			5.4E-02	5.4E-02		
Chloroethane	1.5E - 01						
Chloromethane	3.5E - 01						
Chrysene	2.7E + 02						
Decane, 3,4-Dimethyl	3.3E + 04						
Diacetone alcohol	1.0E + 05						
Dibenz(a,h)anthracene	1.1E + 01						
Dibenzofuran	3.2E + 02						
Diethylphthalate	1.1E + 01						
Dimethyl Disulfide	3.3E + 04						

Table A-30. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-48 – 1 – 10 (mg/kg or pCi/g) 10'	10^{z}	CPP-48 (1993) (mg/kg or pCi/g) 101	201
Dimethylphthalate	1.1E + 01						
Di-n-butylphthalate	2.4E + 01						
Di-n-octylphthalate	2.6E + 01						
Eicosane	1.0E + 05						
Ethyl cyanide	3.3E + 04						
Ethylbenzene	7.8E + 01						
Famphur	1.0E + 05			3.8E-01	3.7E-01		
Fluoranthene	7.6E + 02						
Fluorene	1.8E + 02						
Heptadecane, 2,6,10,15-Tetra	3.3E + 04						
Hexachlorobenzene	1.1E + 01						
Hexachlorobutadiene	2.1E + 01						
Hexachlorocyclopentadiene	1.1E + 01						
Hexachloroethane	1.1E + 01						
Indeno(1,2,3-cd)pyrene	1.1E + 01						
Isobutyl alcohol	1.2E + 00						
Isophorone	1.1E + 01						
Isopropyl Alcohol/2-propanol	1.0E + 05						
Kepone	9.9E + 01						
Mesityl oxide	1.0E + 05						
Methyl Acetate	4.8E - 01						
Methylene Chloride	2.7E + 01						
Naphthalene	4.3E + 02						
Nitrobenzene	1.1E + 01						
N-Nitroso-di-n-propylamine	1.1E + 01			3.7E+00	2.9E+00		
N-Nitrosodiphenylamine	1.1E + 01						
Octane,2,3,7-Trimethyl	3.3E + 04						
o-Toluenesulfonamide	3.3E + 04						
Pentachlorophenol	5.6E + 01			1.9E+00	2.1E+00		
Phenanthrene	1.2E + 03						
Phenol	8.0E + 01			6.8E+00	5.5E+00		
Phenol,2,6-Bis(1,1-Dimethyl)	1.0E + 05						
p-Toluenesulfonamide	3.3E + 04						
Pyrene	2.5E + 02			3.0E+00	2.3E+00		
RDX	1.0E + 01						
Styrene	6.1E - 02						
Tetrachloroethene	9.6E + 00						
Toluene	3.0E + 01			5.7E-02	5.6E-02		
Tributylphosphate	4.8E + 02						
Trichloroethene	3.1E + 01			5.9E-02	5.7E-02		

Table A-30. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-48 – 1 – 10 (mg/kg or pCi/g) 10'	10[z]	CPP-48 (1993) (mg/kg or pCi/g) 101	201
Trinitrotoluene	1.1E + 01						
Undecane,4,6-Dimethyl-	3.3E + 02						
Xylene (ortho)	3.9E + 00						
Xylene (total)	2.8E + 02						
Inorganics							
Aluminum	1.6E + 05						
Antimony	5.8E + 03			ND			
Arsenic	5.8E + 01			3.1E+00 J	4.4E+00	4.0E+00	2.7E+00
Barium	3.0E + 03			6.1E+01	6.2E+01	3.7E+01 B	6.5E+01
Beryllium	1.8E + 01						
Boron	3.3E + 03						
Bromide	3.3E + 04					ND	ND
Cadmium	3.6E + 03					ND	ND
Calcium	NA						
Chloride	3.3E + 04			2.8E+00	3.7E+00	1.2E+00 J	3.3E+00
Chromium	4.1E + 04			1.7E+01	1.9E+01	7.7E+00	1.5E+01
Cobalt	1.1E + 02						
Copper	3.0E + 04			1.1E+01 J	1.2E+01		
Cyanide	3.4E + 02			ND			
Dysprosium	5.9E + 04						
Fluoride	3.9E + 03			5.2E+00		2.4E+02 J	2.6E+02 J
Iron	2.4E + 05						
Lead	5.8E + 04			6.3E+00 J	8.6E+00	6.9E+00	8.8E+00
Magnesium	1.2E + 05						
Manganese	4.9E + 03						
Mercury	9.5E + 03		2.3E+01	ND		5.1E-01	9.5E-01
Molybdenum	1.0E + 04						
Nickel	3.5E + 02			1.9E+01	1.9E+01		
Nitrate	3.9E + 03						
Nitrate/Nitrite-N	3.3E + 04			3.8E+00	5.1E+00	1.3E+00	9.6E+00
Nitrite	8.5E + 00						
Phosphate	3.30E+04						
Phosphorus	NA						
Potassium	4.3E + 04						
Selenium	8.5E + 02			ND		4.4E-01	4.3E-01
Silicon	3.30E+04						
Silver	9.8E + 03			ND		4.4E-01	4.3E-01
Sodium	3.2E + 03						
Strontium	1.8E + 04						

Table A-30. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-48 – 1 – 10 (mg/kg or pCi/g) 10'	CPP-48 – 1 – 10 (mg/kg or pCi/g) 10[z]	CPP-48 (1993) (mg/kg or pCi/g) 101	CPP-48 (1993) (mg/kg or pCi/g) 201
Sulfate	3.3E + 04			1.3E+02	1.7E+02	2.6E+01	2.2E+01
Sulfide	3.3E + 04			1.6E+00	1.5E+00		
Terbium	NA						
Thallium	4.3E + 00			ND			
Tin	3.00E+03			3.0E-02			
Vanadium	4.5E + 02			1.8E+01	1.9E+01		
Ytterbium	NA						
Zinc	2.1E + 05			4.5E+01	5.1E+01		
Zirconium	NA						
Radionuclides				NOT Analyzed			
Ag-108m		8.0E + 05					
Am-241		1.0E + 04	2.9E+02			ND	ND
Am-243		3.3E + 02					
Ba-137m		NA					
C-14		3.0E + 03					
Cd-113m		1.6E + 06					
Ce-144		1.8E + 03				ND	ND
Co-57		3.7E + 03					
Co-60		1.9E + 08				ND	ND
Cs-134		1.1E + 07				ND	ND
Cs-137		2.3E + 12	2.3E+01			4.1E+01	5.9E+01
Eu-152		9.7E + 08	2.7E+02				
Eu-154		8.2E + 08	5.2E+03			ND	ND
Eu-155		1.8E + 08				ND	5.2E-01
H-3		5.0E + 07					
I-129		3.1E + 03					
K-40		2.4E + 05					
Kr-85		NA					
Nb-95		NA				ND	ND
Np-237		6.4E + 05				ND	ND
Pm-147		3.8E + 08					
Pu-238		1.0E + 07	6.7E+02			9.0E-02 J	8.0E-02 J
Pu-239		6.7E + 06	2.5E+02			ND	ND
Pu-240		1.5E + 06	2.5E+02			ND	ND
Pu-241		6.4E + 07	5.6E+04				
Ra-226		4.7E + 05					
Ru-103		NA				ND	ND
Ru-106		1.2E + 04				ND	ND
Sb-125		9.3E + 06				2.4E+00	3.0E+00

Table A-30. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP-48 – 1 – 10 (mg/kg or pCi/g) 10'	CPP-48 – 1 – 10 (mg/kg or pCi/g) 10[z]	CPP-48 (1993) (mg/kg or pCi/g) 101	CPP-48 (1993) (mg/kg or pCi/g) 201
Sm-151		3.4E + 08					
Sr-90		3.5E + 12	2.2E+02				
Tc-99		5.8E + 06					
Te-125m		2.3E + 06					
Th-228		1.6E + 04					
Th-230		1.4E + 04					
Th-232		1.7E + 04					
U-233		1.6E + 08					
U-234		6.0E + 06				1.1E+00 J	1.4E+00 J
U-235		1.1E + 05				ND	ND
U-236		2.0E + 05					
U-238		2.0E + 06				1.1E+00 J	1.5E+00 J
Y-90		2.3E + 10					

NOTES: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
z. Duplicate sample result

ND - Not Detected (concentration reported was below the detection limit)
NA - Not Applicable
J - The sample concentration reported is an estimated value as a result of data validation.

Table A-31. CPP-55 – mercury contaminated area (south of ICPP T-15).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 - 1 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	2 - 4	4 - 6	CPP 55 - 2 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6	CPP 55 - 3 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6
Organics												
1,1,1-Trichloroethane	1.6E + 01											
1,1,2,2-Tetrachloroethane	5.0E - 02											
1,1,2-Trichloroethane	2.4E - 01											
1,1-Dichloroethane	2.3E + 00											
1,1-Dichloroethene	1.5E + 00											
1,2,4-Trichlorobenzene	1.1E + 01											
1,2-Dichlorobenzene	1.1E + 01											
1,2-Dichloroethane	5.4E - 03											
1,2-Dichloroethene (total)	3.2E - 01											
1,3-Dichlorobenzene	1.1E + 01											
1,4-Dichlorobenzene	4.4E + 01											
1,4-Dioxane	1.9E - 02											
2,4,5-Trichlorophenol	4.5E + 01											
2,4,6-Trichlorophenol	1.8E + 01											
2,4-Dichlorophenol	2.2E + 01											
2,4-Dimethylphenol	1.8E + 01											
2,4-Dinitrophenol	5.1E + 01											
2,4-Dinitrotoluene	1.1E + 01											
2,6-Dinitrotoluene	2.1E + 01											
2-Butanone	2.5E + 01											
2-Chloronaphthalene	1.1E + 01											
2-Chlorophenol	1.8E + 01											
2-Hexanone	2.7E + 00											
2-Methylnaphthalene	5.1E + 02											
2-Methylphenol	2.1E + 01											
2-Nitroaniline	1.0E - 01											
2-Nitrophenol	1.8E + 01											
3,3-Dichlorobenzidine	1.1E + 01											
3-Methyl Butanal	3.3E + 04											
3-Nitroaniline	1.0E - 01											
4,6-Dinitro-2-methylphenol	4.5E + 01											
4-Bromophenyl-phenylether	8.5E + 04											
4-Chloro-3-methylphenol	9.6E + 04											
4-Chloroaniline	4.1E + 01											
4-Chlorophenyl-phenylether	1.0E + 05											
4-Methyl-2-Pentanone	3.0E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methylphenol	3.9E + 01											
4-Nitroaniline	1.0E - 01											
4-Nitrophenol	5.2E + 01											
Acenaphthene	2.0E + 02											
Acenaphthylene	2.1E + 01											
Acetone	4.9E + 01											
Acetonitrile	1.2E + 00											
Acrolein	5.5E - 01											

Table A-31. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 - 1 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	2 - 4	4 - 6	CPP 55 - 2 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6	CPP 55 - 3 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6
Acrylonitrile	5.8E - 01											
Anthracene	3.2E + 02											
Aramite	6.7E + 00											
Aroclor-1016	7.7E + 00											
Aroclor-1254	1.3E + 02											
Aroclor-1260	5.0E + 02											
Aroclor-1268	6.2E + 01											
Benzene	2.2E + 02											
Benzidine	1.7E + 01											
Benzo(a)anthracene	2.5E + 02											
Benzo(a)pyrene	1.1E + 02											
Benzo(b)fluoranthene	1.8E + 02											
Benzo(g,h,i)perylene	1.1E + 01											
Benzo(k)fluoranthene	1.9E + 01											
Benzoic acid	8.6E + 00											
bis(2-Chloroethoxy)methane	1.6E + 02											
bis(2-Chloroethyl)ether	1.1E + 01											
bis(2-Chloroisopropyl)ether	1.1E + 01											
bis(2-Ethylhexyl)phthalate	1.5E + 02			ND	ND	ND	ND	ND	ND	ND	ND	ND
Butane,1,1,3,4-Tetrachloro-	1.0E + 05											
Butylbenzylphthalate	6.8E + 01											
Carbazole	3.2E + 01											
Carbon Disulfide	4.6E + 01											
Chlorobenzene	6.6E + 00											
Chloroethane	1.5E - 01											
Chloromethane	3.5E - 01											
Chrysene	2.7E + 02											
Decane, 3,4-Dimethyl	3.3E + 04											
Diacetone alcohol	1.0E + 05											
Dibenz(a,h)anthracene	1.1E + 01											
Dibenzofuran	3.2E + 02											
Diethylphthalate	1.1E + 01											
Dimethyl Disulfide	3.3E + 04											
Dimethylphthalate	1.1E + 01											
Di-n-butylphthalate	2.4E + 01											
Di-n-octylphthalate	2.6E + 01											
Eicosane	1.0E + 05											
Ethyl cyanide	3.3E + 04											
Ethylbenzene	7.8E + 01											
Famphur	1.0E + 05											
Fluoranthene	7.6E + 02											
Fluorene	1.8E + 02											
Heptadecane, 2,6,10,15-Tetra	3.3E + 04											
Hexachlorobenzene	1.1E + 01											
Hexachlorobutadiene	2.1E + 01											
Hexachlorocyclopentadiene	1.1E + 01											

Table A-31. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 - 1 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	2 - 4	4 - 6	CPP 55 - 2 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6	CPP 55 - 3 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6
Hexachloroethane	1.1E + 01											
Indeno(1,2,3-cd)pyrene	1.1E + 01											
Isobutyl alcohol	1.2E + 00											
Isophorone	1.1E + 01											
Isopropyl Alcohol/2-propanol	1.0E + 05											
Kepone	9.9E + 01											
Mesityl oxide	1.0E + 05											
Methyl Acetate	4.8E - 01											
Methylene Chloride	2.7E + 01											
Naphthalene	4.3E + 02											
Nitrobenzene	1.1E + 01											
N-Nitroso-di-n-propylamine	1.1E + 01											
N-Nitrosodiphenylamine	1.1E + 01											
Octane,2,3,7-Trimethyl	3.3E + 04											
o-Toluenesulfonamide	3.3E + 04											
Pentachlorophenol	5.6E + 01											
Phenanthrene	1.2E + 03											
Phenol	8.0E + 01											
Phenol,2,6-Bis(1,1-Dimethyl)	1.0E + 05											
p-Toluenesulfonamide	3.3E + 04											
Pyrene	2.5E + 02											
RDX	1.0E + 01											
Styrene	6.1E - 02											
Tetrachloroethene	9.6E + 00											
Toluene	3.0E + 01			1.0E-03 J	ND	ND	3.0E-03 J	ND	ND	ND	ND	ND
Tributylphosphate	4.8E + 02											
Trichloroethene	3.1E + 01											
Trinitrotoluene	1.1E + 01											
Undecane,4,6-Dimethyl-	3.3E + 02											
Xylene (ortho)	3.9E + 00											
Xylene (total)	2.8E + 02											
Inorganics												
Aluminum	1.6E + 05											
Antimony	5.8E + 03											
Arsenic	5.8E + 01			4.7E+00	5.1E+00	4.7E+00	6.2E+00	6.1E+00	5.5E+00	7.3E+00	4.9E+00	5.1E+00
Barium	3.0E + 03			2.2E+02	7.0E+01	9.1E+01	1.4E+02	1.3E+02	9.6E+01	1.2E+02	1.2E+02	1.2E+02
Beryllium	1.8E + 01											
Boron	3.3E + 03											
Cadmium	3.6E + 03			ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	NA											
Chloride	3.3E + 04											
Chromium	4.1E + 04			2.5E+01	2.9E+01	2.2E+01	3.2E+01	3.0E+01	1.5E+01	3.9E+01	2.4E+01	3.0E+01
Cobalt	1.1E + 02											
Copper	3.0E + 04											
Cyanide	3.4E + 02											

Table A-31. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 - 1 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	2 - 4	4 - 6	CPP 55 - 2 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6	CPP 55 - 3 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6
Dysprosium	5.9E + 04											
Fluoride	3.9E + 03											
Iron	2.4E + 05			1.8E+04	1.1E+04	1.1E+04	1.4E+04	1.3E+04	1.1E+04	1.3E+04	1.3E+04	1.1E+04
Lead	5.8E + 04			1.3E+01	6.3E+00	6.3E+00	1.1E+01	1.0E+01	7.6E+00	1.1E+01	7.8E+00	5.8E+00
Magnesium	1.2E + 05											
Manganese	4.9E + 03											
Mercury	9.5E + 03		2.3E+01	ND	ND	ND	1.2E-01	2.7E-01	ND	9.0E-02 B	4.5E-01	7.0E-02 B
Molybdenum	1.0E + 04											
Nickel	3.5E + 02			2.0E+01	1.6E+01	1.7E+01	2.2E+01	1.9E+01	1.7E+01	2.0E+01	1.7E+01	2.1E+01
Nitrate	3.9E + 03											
Nitrate/Nitrite-N	3.3E + 04											
Nitrite	8.5E + 00											
Phosphate	3.30E+04											
Phosphorus	NA											
Potassium	4.3E + 04											
Selenium	8.5E + 02			ND	ND	ND	ND	ND	ND	ND	ND	ND
Silicon	3.30E+04											
Silver	9.8E + 03			2.9E+00	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	3.2E + 03											
Strontium	1.8E + 04											
Sulfate	3.3E + 04											
Sulfide	3.3E + 04											
Terbium	NA											
Thallium	4.3E + 00											
Tin	3.00E+03											
Vanadium	4.5E + 02											
Ytterbium	NA											
Zinc	2.1E + 05											
Zirconium	NA											
Radionuclides				NOT Analyzed								

NOTES: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Not Detected (concentration reported was below the detection limit)
NA - Not Applicable

B - Sample result is greater than the instrument detection limit, but less than the contract required detection limit.
J - The sample concentration reported is an estimated value as a result of data validation.

Table A-32. CPP-55 – mercury contaminated area (south of ICPP T-15).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 - 4 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	2 - 4	4 - 6	CPP 55 - 5 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6	CPP 55 - 6 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6
Organics												
1,1,1-Trichloroethane	1.6E + 01											
1,1,2,2-Tetrachloroethane	5.0E - 02											
1,1,2-Trichloroethane	2.4E - 01											
1,1-Dichloroethane	2.3E + 00											
1,1-Dichloroethene	1.5E + 00											
1,2,4-Trichlorobenzene	1.1E + 01											
1,2-Dichlorobenzene	1.1E + 01											
1,2-Dichloroethane	5.4E - 03											
1,2-Dichloroethene (total)	3.2E - 01											
1,3-Dichlorobenzene	1.1E + 01											
1,4-Dichlorobenzene	4.4E + 01											
1,4-Dioxane	1.9E - 02											
2,4,5-Trichlorophenol	4.5E + 01											
2,4,6-Trichlorophenol	1.8E + 01											
2,4-Dichlorophenol	2.2E + 01											
2,4-Dimethylphenol	1.8E + 01											
2,4-Dinitrophenol	5.1E + 01											
2,4-Dinitrotoluene	1.1E + 01											
2,6-Dinitrotoluene	2.1E + 01											
2-Butanone	2.5E + 01											
2-Chloronaphthalene	1.1E + 01											
2-Chlorophenol	1.8E + 01											
2-Hexanone	2.7E + 00											
2-Methylnaphthalene	5.1E + 02											
2-Methylphenol	2.1E + 01											
2-Nitroaniline	1.0E - 01											
2-Nitrophenol	1.8E + 01											
3,3-Dichlorobenzidine	1.1E + 01											
3-Methyl Butanal	3.3E + 04											
3-Nitroaniline	1.0E - 01											
4,6-Dinitro-2-methylphenol	4.5E + 01											
4-Bromophenyl-phenylether	8.5E + 04											
4-Chloro-3-methylphenol	9.6E + 04											
4-Chloroaniline	4.1E + 01											
4-Chlorophenyl-phenylether	1.0E + 05											
4-Methyl-2-Pentanone	3.0E + 01			ND	ND	ND	ND	ND	ND	1.5E-02	ND	ND
4-Methylphenol	3.9E + 01											
4-Nitroaniline	1.0E - 01											
4-Nitrophenol	5.2E + 01											
Acenaphthene	2.0E + 02											
Acenaphthylene	2.1E + 01											

Table A-32. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 - 4 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	2 - 4	4 - 6	CPP 55 - 5 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6	CPP 55 - 6 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6
Acetone	4.9E + 01											
Acetonitrile	1.2E + 00											
Acrolein	5.5E - 01											
Acrylonitrile	5.8E - 01											
Anthracene	3.2E + 02											
Aramite	6.7E + 00											
Aroclor-1016	7.7E + 00											
Aroclor-1254	1.3E + 02											
Aroclor-1260	5.0E + 02											
Aroclor-1268	6.2E + 01											
Benzene	2.2E + 02											
Benzidine	1.7E + 01											
Benzo(a)anthracene	2.5E + 02											
Benzo(a)pyrene	1.1E + 02											
Benzo(b)fluoranthene	1.8E + 02											
Benzo(g,h,i)perylene	1.1E + 01											
Benzo(k)fluoranthene	1.9E + 01											
Benzoic acid	8.6E + 00											
bis(2-Chloroethoxy)methane	1.6E + 02											
bis(2-Chloroethyl)ether	1.1E + 01											
bis(2-Chloroisopropyl)ether	1.1E + 01											
bis(2-Ethylhexyl)phthalate	1.5E + 02			ND	ND	ND	ND	ND	ND	1.8E+00	4.0E+00	ND
Butane,1,1,3,4-Tetrachloro-	1.0E + 05											
Butylbenzylphthalate	6.8E + 01											
Carbazole	3.2E + 01											
Carbon Disulfide	4.6E + 01											
Chlorobenzene	6.6E + 00											
Chloroethane	1.5E - 01											
Chloromethane	3.5E - 01											
Chrysene	2.7E + 02											
Decane, 3,4-Dimethyl	3.3E + 04											
Diacetone alcohol	1.0E + 05											
Dibenz(a,h)anthracene	1.1E + 01											
Dibenzofuran	3.2E + 02											
Diethylphthalate	1.1E + 01											
Dimethyl Disulfide	3.3E + 04											
Dimethylphthalate	1.1E + 01											
Di-n-butylphthalate	2.4E + 01											
Di-n-octylphthalate	2.6E + 01											
Eicosane	1.0E + 05											
Ethyl cyanide	3.3E + 04											
Ethylbenzene	7.8E + 01											
Famphur	1.0E + 05											

Table A-32. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 - 4 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	2 - 4	4 - 6	CPP 55 - 5 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6	CPP 55 - 6 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6
Fluoranthene	7.6E + 02											
Fluorene	1.8E + 02											
Heptadecane, 2,6,10,15-Tetra	3.3E + 04											
Hexachlorobenzene	1.1E + 01											
Hexachlorobutadiene	2.1E + 01											
Hexachlorocyclopentadiene	1.1E + 01											
Hexachloroethane	1.1E + 01											
Indeno(1,2,3-cd)pyrene	1.1E + 01											
Isobutyl alcohol	1.2E + 00											
Isophorone	1.1E + 01											
Isopropyl Alcohol/2-propanol	1.0E + 05											
Kepone	9.9E + 01											
Mesityl oxide	1.0E + 05											
Methyl Acetate	4.8E - 01											
Methylene Chloride	2.7E + 01											
Naphthalene	4.3E + 02											
Nitrobenzene	1.1E + 01											
N-Nitroso-di-n-propylamine	1.1E + 01											
N-Nitrosodiphenylamine	1.1E + 01											
Octane,2,3,7-Trimethyl	3.3E + 04											
o-Toluenesulfonamide	3.3E + 04											
Pentachlorophenol	5.6E + 01											
Phenanthrene	1.2E + 03											
Phenol	8.0E + 01											
Phenol,2,6-Bis(1,1-Dimethyl)	1.0E + 05											
p-Toluenesulfonamide	3.3E + 04											
Pyrene	2.5E + 02											
RDX	1.0E + 01											
Styrene	6.1E - 02											
Tetrachloroethene	9.6E + 00											
Toluene	3.0E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
Tributylphosphate	4.8E + 02											
Trichloroethene	3.1E + 01											
Trinitrotoluene	1.1E + 01											
Undecane,4,6-Dimethyl-	3.3E + 02											
Xylene (ortho)	3.9E + 00											
Xylene (total)	2.8E + 02											

Table A-32. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 - 4 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	2 - 4	4 - 6	CPP 55 - 5 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6	CPP 55 - 6 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6
Inorganics												
Aluminum	1.6E + 05											
Antimony	5.8E + 03											
Arsenic	5.8E + 01			6.7E+00	6.0E+00	5.9E+00	5.7E+00	5.0E+00	4.7E+00	4.9E+00	5.0E+00	6.4E+00
Barium	3.0E + 03			1.4E+02	1.3E+02	1.2E+02	1.8E+02	9.7E+01	8.6E+01	1.1E+02	8.9E+01	1.6E+02
Beryllium	1.8E + 01											
Boron	3.3E + 03											
Cadmium	3.6E + 03			ND	ND	ND	ND	ND	ND	1.1E+00	ND	1.4E+00
Calcium	NA											
Chloride	3.3E + 04											
Chromium	4.1E + 04			2.3E+01	2.0E+01	2.3E+01	3.3E+01	2.3E+01	2.4E+01	1.6E+01	1.3E+01	2.1E+01
Cobalt	1.1E + 02											
Copper	3.0E + 04											
Cyanide	3.4E + 02											
Dysprosium	5.9E + 04											
Fluoride	3.9E + 03											
Iron	2.4E + 05			1.4E+04	1.3E+04	1.4E+05	1.7E+04	1.2E+04	9.7E+03			
Lead	5.8E + 04			1.2E+01	9.7E+00	1.7E+01	1.0E+01	3.2E+01	6.8E+00	8.9E+00	9.0E+00	8.6E+00
Magnesium	1.2E + 05											
Manganese	4.9E + 03											
Mercury	9.5E + 03		2.3E+01	6.5E-01	4.2E-01	2.0E-01	1.9E-01	ND	1.2E-01	1.1E-01	2.0E-01	2.2E-01
Molybdenum	1.0E + 04											
Nickel	3.5E + 02			2.3E+01	2.1E+01	2.4E+01	2.4E+01	1.8E+01	1.8E+01	2.0E+01	1.7E+01	2.8E+01
Nitrate	3.9E + 03											
Nitrate/Nitrite-N	3.3E + 04											
Nitrite	8.5E + 00											
Phosphate	3.30E+04											
Phosphorus	NA											
Potassium	4.3E + 04											
Selenium	8.5E + 02			ND	ND	ND	ND	ND	ND	ND	ND	ND
Silicon	3.30E+04											
Silver	9.8E + 03			ND	ND	ND	3.0E+00	2.1E+00	2.0E+00	ND	ND	ND
Sodium	3.2E + 03											
Strontium	1.8E + 04											
Sulfate	3.3E + 04											
Sulfide	3.3E + 04											
Terbium	NA											
Thallium	4.3E + 00											
Tin	3.00E+03											
Vanadium	4.5E + 02											
Ytterbium	NA											
Zinc	2.1E + 05											
Zirconium	NA											

Table A-32. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 - 4 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	CPP 55 - 4 (mg/Kg or pCi/g) Sample Depth (ft) 2 - 4	CPP 55 - 4 (mg/Kg or pCi/g) Sample Depth (ft) 4 - 6	CPP 55 - 5 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	CPP 55 - 5 (mg/Kg or pCi/g) Sample Depth (ft) 2 - 4	CPP 55 - 5 (mg/Kg or pCi/g) Sample Depth (ft) 4 - 6	CPP 55 - 6 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	CPP 55 - 6 (mg/Kg or pCi/g) Sample Depth (ft) 2 - 4	CPP 55 - 6 (mg/Kg or pCi/g) Sample Depth (ft) 4 - 6
Radionuclides				NOT Analyzed								

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum dection limit)
NA - Not Applicable

Table A-33. CPP-55 – mercury contaminated area (south of ICPP T-15).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 - 7 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	CPP 55 - 7 (mg/Kg or pCi/g) Sample Depth (ft) 2 - 4	CPP 55 - 7 (mg/Kg or pCi/g) Sample Depth (ft) 4 - 6	CPP 55 – 8 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	CPP 55 – 8 (mg/Kg or pCi/g) Sample Depth (ft) 2 - 4	CPP 55 – 8 (mg/Kg or pCi/g) Sample Depth (ft) 4 - 6	CPP 55 – 9 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	CPP 55 – 9 (mg/Kg or pCi/g) Sample Depth (ft) 2 - 4	CPP 55 – 9 (mg/Kg or pCi/g) Sample Depth (ft) 4 - 6
Organics												
1,1,1-Trichloroethane	1.6E + 01											
1,1,2,2-Tetrachloroethane	5.0E - 02											
1,1,2-Trichloroethane	2.4E - 01											
1,1-Dichloroethane	2.3E + 00											
1,1-Dichloroethene	1.5E + 00											
1,2,4-Trichlorobenzene	1.1E + 01											
1,2-Dichlorobenzene	1.1E + 01											
1,2-Dichloroethane	5.4E - 03											
1,2-Dichloroethene (total)	3.2E - 01											
1,3-Dichlorobenzene	1.1E + 01											
1,4-Dichlorobenzene	4.4E + 01											
1,4-Dioxane	1.9E - 02											
2,4,5-Trichlorophenol	4.5E + 01											
2,4,6-Trichlorophenol	1.8E + 01											
2,4-Dichlorophenol	2.2E + 01											
2,4-Dimethylphenol	1.8E + 01											
2,4-Dinitrophenol	5.1E + 01											
2,4-Dinitrotoluene	1.1E + 01											
2,6-Dinitrotoluene	2.1E + 01											
2-Butanone	2.5E + 01											
2-Chloronaphthalene	1.1E + 01											
2-Chlorophenol	1.8E + 01											
2-Hexanone	2.7E + 00											
2-Methylnaphthalene	5.1E + 02											
2-Methylphenol	2.1E + 01											
2-Nitroaniline	1.0E - 01											
2-Nitrophenol	1.8E + 01											
3,3-Dichlorobenzidine	1.1E + 01											
3-Methyl Butanal	3.3E + 04											
3-Nitroaniline	1.0E - 01											
4,6-Dinitro-2-methylphenol	4.5E + 01											
4-Bromophenyl-phenylether	8.5E + 04											
4-Chloro-3-methylphenol	9.6E + 04											
4-Chloroaniline	4.1E + 01											
4-Chlorophenyl-phenylether	1.0E + 05											
4-Methyl-2-Pentanone	3.0E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methylphenol	3.9E + 01											
4-Nitroaniline	1.0E - 01											
4-Nitrophenol	5.2E + 01											
Acenaphthene	2.0E + 02											
Acenaphthylene	2.1E + 01											
Acetone	4.9E + 01											
Acetonitrile	1.2E + 00											

Table A-33. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 - 7 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	CPP 55 - 7 (mg/Kg or pCi/g) Sample Depth (ft) 2 - 4	CPP 55 - 7 (mg/Kg or pCi/g) Sample Depth (ft) 4 - 6	CPP 55 – 8 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	CPP 55 – 8 (mg/Kg or pCi/g) Sample Depth (ft) 2 - 4	CPP 55 – 8 (mg/Kg or pCi/g) Sample Depth (ft) 4 - 6	CPP 55 – 9 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	CPP 55 – 9 (mg/Kg or pCi/g) Sample Depth (ft) 2 - 4	CPP 55 – 9 (mg/Kg or pCi/g) Sample Depth (ft) 4 - 6
Acrolein	5.5E - 01											
Acrylonitrile	5.8E - 01											
Anthracene	3.2E + 02											
Aramite	6.7E + 00											
Aroclor-1016	7.7E + 00											
Aroclor-1254	1.3E + 02											
Aroclor-1260	5.0E + 02											
Aroclor-1268	6.2E + 01											
Benzene	2.2E + 02											
Benzidine	1.7E + 01											
Benzo(a)anthracene	2.5E + 02											
Benzo(a)pyrene	1.1E + 02											
Benzo(b)fluoranthene	1.8E + 02											
Benzo(g,h,i)perylene	1.1E + 01											
Benzo(k)fluoranthene	1.9E + 01											
Benzoic acid	8.6E + 00											
bis(2-Chloroethoxy)methane	1.6E + 02											
bis(2-Chloroethyl)ether	1.1E + 01											
bis(2-Chloroisopropyl)ether	1.1E + 01											
bis(2-Ethylhexyl)phthalate	1.5E + 02			ND	ND	ND	ND	ND	ND	ND	ND	ND
Butane,1,1,3,4-Tetrachloro-	1.0E + 05											
Butylbenzylphthalate	6.8E + 01											
Carbazole	3.2E + 01											
Carbon Disulfide	4.6E + 01											
Chlorobenzene	6.6E + 00											
Chloroethane	1.5E - 01											
Chloromethane	3.5E - 01											
Chrysene	2.7E + 02											
Decane, 3,4-Dimethyl	3.3E + 04											
Diacetone alcohol	1.0E + 05											
Dibenz(a,h)anthracene	1.1E + 01											
Dibenzofuran	3.2E + 02											
Diethylphthalate	1.1E + 01											
Dimethyl Disulfide	3.3E + 04											
Dimethylphthalate	1.1E + 01											
Di-n-butylphthalate	2.4E + 01											
Di-n-octylphthalate	2.6E + 01											
Eicosane	1.0E + 05											
Ethyl cyanide	3.3E + 04											
Ethylbenzene	7.8E + 01											
Famphur	1.0E + 05											
Fluoranthene	7.6E + 02											
Fluorene	1.8E + 02											
Heptadecane, 2,6,10,15-Tetra	3.3E + 04											
Hexachlorobenzene	1.1E + 01											

Table A-33. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 - 7 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	2 - 4	4 - 6	CPP 55 – 8 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6	CPP 55 – 9 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6
Hexachlorobutadiene	2.1E + 01											
Hexachlorocyclopentadiene	1.1E + 01											
Hexachloroethane	1.1E + 01											
Indeno(1,2,3-cd)pyrene	1.1E + 01											
Isobutyl alcohol	1.2E + 00											
Isophorone	1.1E + 01											
Isopropyl Alcohol/2-propanol	1.0E + 05											
Kepone	9.9E + 01											
Mesityl oxide	1.0E + 05											
Methyl Acetate	4.8E - 01											
Methylene Chloride	2.7E + 01											
Naphthalene	4.3E + 02											
Nitrobenzene	1.1E + 01											
N-Nitroso-di-n-propylamine	1.1E + 01											
N-Nitrosodiphenylamine	1.1E + 01											
Octane,2,3,7-Trimethyl	3.3E + 04											
o-Toluenesulfonamide	3.3E + 04											
Pentachlorophenol	5.6E + 01											
Phenanthrene	1.2E + 03											
Phenol	8.0E + 01											
Phenol,2,6-Bis(1,1-Dimethyl)	1.0E + 05											
p-Toluenesulfonamide	3.3E + 04											
Pyrene	2.5E + 02											
RDX	1.0E + 01											
Styrene	6.1E - 02											
Tetrachloroethene	9.6E + 00											
Toluene	3.0E + 01			ND	ND	ND	ND	ND	ND	ND	ND	ND
Tributylphosphate	4.8E + 02											
Trichloroethene	3.1E + 01											
Trinitrotoluene	1.1E + 01											
Undecane,4,6-Dimethyl-	3.3E + 02											
Xylene (ortho)	3.9E + 00											
Xylene (total)	2.8E + 02											
Inorganics												
Aluminum	1.6E + 05											
Antimony	5.8E + 03											
Arsenic	5.8E + 01			5.6E+00	1.3E+01	8.0E+00	6.5E+00	6.1E+00	6.1E+00	8.0E+00	7.1E+00	6.2E+00
Barium	3.0E + 03			1.3E+02	1.1E+02	8.2E+01	1.4E+02	1.3E+02	9.5E+01	1.6E+02	1.3E+02	1.1E+02
Beryllium	1.8E + 01											
Boron	3.3E + 03											
Cadmium	3.6E + 03			ND	ND	ND	ND	ND	ND	ND	9.4E-01	ND
Calcium	NA											
Chloride	3.3E + 04											
Chromium	4.1E + 04			2.2E+01	2.1E+01	1.6E+01	2.5E+01	2.5E+01	2.1E+01	4.1E+01	2.1E+01	1.8E+01

Table A-33. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 - 7 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	2 - 4	4 - 6	CPP 55 – 8 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6	CPP 55 – 9 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6
Cobalt	1.1E + 02											
Copper	3.0E + 04											
Cyanide	3.4E + 02											
Dysprosium	5.9E + 04											
Fluoride	3.9E + 03											
Iron	2.4E + 05			1.3E+04	1.1E+04	8.7E+03	1.5E+04	1.5E+04	1.3E+04	1.8E+04	1.4E+04	1.2E+04
Lead	5.8E + 04			8.4E+00	9.6E+00	1.5E+01	2.9E+01	7.9E+00	6.9E+00	1.1E+01	1.1E+01	7.2E+00
Magnesium	1.2E + 05											
Manganese	4.9E + 03											
Mercury	9.5E + 03		2.3E+01	5.8E-01	5.0E-02	5.0E-02	8.0E-02 B	ND	ND	1.3E-01	ND	ND
Molybdenum	1.0E + 04											
Nickel	3.5E + 02			1.9E+01	1.8E+01	1.6E+01	6.5E+01	2.2E+01	1.9E+01	2.7E+01	1.9E+01	1.8E+01
Nitrate	3.9E + 03											
Nitrate/Nitrite-N	3.3E + 04											
Nitrite	8.5E + 00											
Phosphate	3.30E+04											
Phosphorus	NA											
Potassium	4.3E + 04											
Selenium	8.5E + 02			ND	ND	ND	ND	ND	ND	ND	ND	ND
Silicon	3.30E+04											
Silver	9.8E + 03			2.1E+00	ND	ND	ND	1.9E+00	ND	ND	ND	ND
Sodium	3.2E + 03											
Strontium	1.8E + 04											
Sulfate	3.3E + 04											
Sulfide	3.3E + 04											
Terbium	NA											
Thallium	4.3E + 00											
Tin	3.00E+03											
Vanadium	4.5E + 02											
Ytterbium	NA											
Zinc	2.1E + 05											
Zirconium	NA											
Radionuclides				NOT Analyzed								

NOTES: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
z. Duplicate sample result

ND - Not Detected (concentration reported was below the detection limit)
NA - Not Applicable

B - Sample result is greater than the instrument detection limit, but less than the contract required detection limit.

Table A-34. CPP-55 – mercury contaminated area (south of ICPP T-15).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 – 10 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	2 - 4	4 - 6	CPP 55 – 11 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6
Organics									
1,1,1-Trichloroethane	1.6E + 01								
1,1,2,2-Tetrachloroethane	5.0E - 02								
1,1,2-Trichloroethane	2.4E - 01								
1,1-Dichloroethane	2.3E + 00								
1,1-Dichloroethene	1.5E + 00								
1,2,4-Trichlorobenzene	1.1E + 01								
1,2-Dichlorobenzene	1.1E + 01								
1,2-Dichloroethane	5.4E - 03								
1,2-Dichloroethene (total)	3.2E - 01								
1,3-Dichlorobenzene	1.1E + 01								
1,4-Dichlorobenzene	4.4E + 01								
1,4-Dioxane	1.9E - 02								
2,4,5-Trichlorophenol	4.5E + 01								
2,4,6-Trichlorophenol	1.8E + 01								
2,4-Dichlorophenol	2.2E + 01								
2,4-Dimethylphenol	1.8E + 01								
2,4-Dinitrophenol	5.1E + 01								
2,4-Dinitrotoluene	1.1E + 01								
2,6-Dinitrotoluene	2.1E + 01								
2-Butanone	2.5E + 01								
2-Chloronaphthalene	1.1E + 01								
2-Chlorophenol	1.8E + 01								
2-Hexanone	2.7E + 00								
2-Methylnaphthalene	5.1E + 02								
2-Methylphenol	2.1E + 01								
2-Nitroaniline	1.0E - 01								
2-Nitrophenol	1.8E + 01								
3,3-Dichlorobenzidine	1.1E + 01								
3-Methyl Butanal	3.3E + 04								
3-Nitroaniline	1.0E - 01								
4,6-Dinitro-2-methylphenol	4.5E + 01								
4-Bromophenyl-phenylether	8.5E + 04								
4-Chloro-3-methylphenol	9.6E + 04								
4-Chloroaniline	4.1E + 01								
4-Chlorophenyl-phenylether	1.0E + 05								
4-Methyl-2-Pentanone	3.0E + 01			ND	ND	ND	ND	ND	ND
4-Methylphenol	3.9E + 01								
4-Nitroaniline	1.0E - 01								
4-Nitrophenol	5.2E + 01								
Acenaphthene	2.0E + 02								
Acenaphthylene	2.1E + 01								

Table A-34. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 – 10 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	2 - 4	4 - 6	CPP 55 – 11 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6
Acetone	4.9E + 01								
Acetonitrile	1.2E + 00								
Acrolein	5.5E - 01								
Acrylonitrile	5.8E - 01								
Anthracene	3.2E + 02								
Aramite	6.7E + 00								
Aroclor-1016	7.7E + 00								
Aroclor-1254	1.3E + 02								
Aroclor-1260	5.0E + 02								
Aroclor-1268	6.2E + 01								
Benzene	2.2E + 02								
Benzidine	1.7E + 01								
Benzo(a)anthracene	2.5E + 02								
Benzo(a)pyrene	1.1E + 02								
Benzo(b)fluoranthene	1.8E + 02								
Benzo(g,h,i)perylene	1.1E + 01								
Benzo(k)fluoranthene	1.9E + 01								
Benzoic acid	8.6E + 00								
bis(2-Chloroethoxy)methane	1.6E + 02								
bis(2-Chloroethyl)ether	1.1E + 01								
bis(2-Chloroisopropyl)ether	1.1E + 01								
bis(2-Ethylhexyl)phthalate	1.5E + 02			ND	ND	ND	ND	ND	ND
Butane,1,1,3,4-Tetrachloro-	1.0E + 05								
Butylbenzylphthalate	6.8E + 01								
Carbazole	3.2E + 01								
Carbon Disulfide	4.6E + 01								
Chlorobenzene	6.6E + 00								
Chloroethane	1.5E - 01								
Chloromethane	3.5E - 01								
Chrysene	2.7E + 02								
Decane, 3,4-Dimethyl	3.3E + 04								
Diacetone alcohol	1.0E + 05								
Dibenz(a,h)anthracene	1.1E + 01								
Dibenzofuran	3.2E + 02								
Diethylphthalate	1.1E + 01								
Dimethyl Disulfide	3.3E + 04								
Dimethylphthalate	1.1E + 01								
Di-n-butylphthalate	2.4E + 01								
Di-n-octylphthalate	2.6E + 01								
Eicosane	1.0E + 05								
Ethyl cyanide	3.3E + 04								
Ethylbenzene	7.8E + 01								
Famphur	1.0E + 05								

Table A-34. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 – 10 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	2 - 4	4 - 6	CPP 55 – 11 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6
Fluoranthene	7.6E + 02								
Fluorene	1.8E + 02								
Heptadecane, 2,6,10,15-Tetra	3.3E + 04								
Hexachlorobenzene	1.1E + 01								
Hexachlorobutadiene	2.1E + 01								
Hexachlorocyclopentadiene	1.1E + 01								
Hexachloroethane	1.1E + 01								
Indeno(1,2,3-cd)pyrene	1.1E + 01								
Isobutyl alcohol	1.2E + 00								
Isophorone	1.1E + 01								
Isopropyl Alcohol/2-propanol	1.0E + 05								
Kepone	9.9E + 01								
Mesityl oxide	1.0E + 05								
Methyl Acetate	4.8E - 01								
Methylene Chloride	2.7E + 01								
Naphthalene	4.3E + 02								
Nitrobenzene	1.1E + 01								
N-Nitroso-di-n-propylamine	1.1E + 01								
N-Nitrosodiphenylamine	1.1E + 01								
Octane,2,3,7-Trimethyl	3.3E + 04								
o-Toluenesulfonamide	3.3E + 04								
Pentachlorophenol	5.6E + 01								
Phenanthrene	1.2E + 03								
Phenol	8.0E + 01								
Phenol,2,6-Bis(1,1-Dimethyl)	1.0E + 05								
p-Toluenesulfonamide	3.3E + 04								
Pyrene	2.5E + 02								
RDX	1.0E + 01								
Styrene	6.1E - 02								
Tetrachloroethene	9.6E + 00								
Toluene	3.0E + 01			ND	ND	ND	ND	ND	ND
Tributylphosphate	4.8E + 02								
Trichloroethene	3.1E + 01								
Trinitrotoluene	1.1E + 01								
Undecane,4,6-Dimethyl-	3.3E + 02								
Xylene (ortho)	3.9E + 00								
Xylene (total)	2.8E + 02								

Table A-34. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 – 10 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	2 - 4	4 - 6	CPP 55 – 11 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	2 - 4	4 - 6
Inorganics									
Aluminum	1.6E + 05								
Antimony	5.8E + 03								
Arsenic	5.8E + 01			4.7E+00	6.2E+00	6.0E+00	5.2E+00	3.8E+00	4.4E+00
Barium	3.0E + 03			1.8E+02	1.6E+02	8.8E+01	1.5E+02	1.3E+02	1.1E+02
Beryllium	1.8E + 01								
Boron	3.3E + 03								
Cadmium	3.6E + 03			ND	ND	ND	ND	ND	ND
Calcium	NA								
Chloride	3.3E + 04								
Chromium	4.1E + 04			3.0E+01	3.0E+01	1.8E+01	2.5E+01	2.6E+01	6.5E+01
Cobalt	1.1E + 02								
Copper	3.0E + 04								
Cyanide	3.4E + 02								
Dysprosium	5.9E + 04								
Fluoride	3.9E + 03								
Iron	2.4E + 05			1.7E+04	1.6E+04	1.1E+04	1.5E+04	1.6E+04	1.2E+04
Lead	5.8E + 04			9.0E+00	1.0E+01	6.3E+00	9.7E+00	6.9E+00	6.1E+00
Magnesium	1.2E + 05								
Manganese	4.9E + 03								
Mercury	9.5E + 03		2.3E+01	4.9E-01	1.1E-01	ND	5.2E+00	ND	ND
Molybdenum	1.0E + 04								
Nickel	3.5E + 02			2.4E+01	2.4E+01	1.6E+01	2.2E+01	2.5E+01	2.0E+01
Nitrate	3.9E + 03								
Nitrate/Nitrite-N	3.3E + 04								
Nitrite	8.5E + 00								
Phosphate	3.30E+04								
Phosphorus	NA								
Potassium	4.3E + 04								
Selenium	8.5E + 02			ND	ND	ND	ND	ND	ND
Silicon	3.30E+04								
Silver	9.8E + 03			2.3E+00	2.5E+00	2.0E+00	2.4E+00	2.4E+00	ND
Sodium	3.2E + 03								
Strontium	1.8E + 04								
Sulfate	3.3E + 04								
Sulfide	3.3E + 04								
Terbium	NA								
Thallium	4.3E + 00								
Tin	3.00E+03								
Vanadium	4.5E + 02								
Ytterbium	NA								
Zinc	2.1E + 05								
Zirconium	NA								

Table A-34. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	Selected ICDF WAC Concentration Guideline[a] (pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 55 – 10 (mg/Kg or pCi/g) Sample Depth (ft) 0 -2	CPP 55 – 10 (mg/Kg or pCi/g) Sample Depth (ft) 2 - 4	CPP 55 – 10 (mg/Kg or pCi/g) Sample Depth (ft) 4 - 6	CPP 55 – 11 (mg/Kg or pCi/g) Sample Depth (ft) 0 - 2	CPP 55 – 11 (mg/Kg or pCi/g) Sample Depth (ft) 2 - 4	CPP 55 – 11 (mg/Kg or pCi/g) Sample Depth (ft) 4 - 6
Radionuclides				NOT Analyzed					

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum dection limit)
NA - Not Applicable

Table A-35. CPP-81 – abandoned CPP-637/CPP-601 VOG line.

Constituent	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 81 - 101 mg/l (TCLP)	CPP 81 - 102 mg/l (TCLP)
Inorganics					
Aluminum	1.6E + 05				
Antimony	5.8E + 03			6.7E-02	7.9E-02
Arsenic	5.8E + 01			ND	ND
Barium	3.0E + 03			2.5E-01 B	2.4E-01 B
Beryllium	1.8E + 01			ND	ND
Boron	3.3E + 03				
Cadmium	3.6E + 03			9.6E+00	1.5E+01
Calcium	NA				
Chloride	3.3E + 04				
Chromium	4.1E + 04			1.1E+01	1.2E+01
Cobalt	1.1E + 02				
Copper	3.0E + 04				
Cyanide	3.4E + 02				
Dysprosium	5.9E + 04				
Fluoride	3.9E + 03				
Iron	2.4E + 05				
Lead	5.8E + 04			ND	5.2E-02 B
Magnesium	1.2E + 05				
Manganese	4.9E + 03				
Mercury	9.5E + 03		2.3E+01	66E-04 J	ND
Molybdenum	1.0E + 04				
Nickel	3.5E + 02			1.5E+00	1.5E+00
Nitrate	3.9E + 03				
Nitrate/Nitrite-N	3.3E + 04				
Nitrite	8.5E + 00				
Phosphate	3.30E+04				
Phosphorus	NA				
Potassium	4.3E + 04				
Selenium	8.5E + 02			ND	ND
Silicon	3.30E+04				
Silver	9.8E + 03			5.8E-01	6.0E-01
Sodium	3.2E + 03				
Strontium	1.8E + 04				
Sulfate	3.3E + 04				
Sulfide	3.3E + 04				
Terbium	NA				
Thallium	4.3E + 00			ND	ND
Tin	3.00E+03				
Vanadium	4.5E + 02			2.9E-02 B	2.1E-02 B
Ytterbium	NA				

Table A-35. (continued).

Constituent	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 81 - 101 mg/l (TCLP)	CPP 81 - 102 mg/l (TCLP)
Zinc	2.1E + 05				
Zirconium	NA				

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
J - The sample concentration reported is an estimated value as a result of data validation.
ND - Non-Detect (value is below the minimum dection limit)
NA - Not Applicable

Table A-36. CPP-91 – CPP-633 blower pit drain.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a]		Remediation Goals (RGs) from ROD[b]	CPP-91 – 1 (mg/kg or pCi/g) Sample Depth (ft)			CPP-91 – 2 (mg/kg or pCi/g) Sample Depth (ft)		
	(mg/kg)	(pCi/g)	(mg/kg or pCi/g)	0 - 0.5	2.5 - 5	7.5 - 10	0 - 0.5	0.5 - 2.5	5 - 7.5
Organics				NOT Analyzed					
Inorganics									
Aluminum	1.6E + 05			4.7E+03	7.4E+03	5.9E+03	5.4E+03	5.1E+03	5.4E+03
Antimony	5.8E + 03			6.5E-01 B	7.7E-01 B	6.4E-01 B	1.0E+00 B	5.8E-01 B	7.1E-01 B
Arsenic	5.8E + 01			5.4E+00	5.9E+00	6.3E+00	4.1E+00	6.3E+00	3.6E+00
Barium	3.0E + 03			7.8E+01	1.1E+02	9.7E+01	1.0E+00	9.0E+01	9.2E+01
Beryllium	1.8E + 01			3.7E-01	5.1E-01	4.3E+01	4.1E-01	3.7E-01	5.0E-01
Boron	3.3E + 03								
Cadmium	3.6E + 03			1.5E+00	1.8E+00	1.6E+00	4.7E-01 B	4.3E-01 B	5.8E-01 B
Calcium	NA			2.6E+04 J	1.7E+04 J	1.8E+04 J	2.2E+04 J	2.5E+04 J	2.1E+04 J
Chloride	3.3E + 04								
Chromium	4.1E + 04			1.5E+01 J	2.2E+01 J	1.8E+01 J	2.1E+01	2.0E+01	2.0E+01
Cobalt	1.1E + 02			4.8E+00 B	6.3E+00 B	5.4E+00 B	5.6E+00 B	4.9E+00 B	5.8E+00 B
Copper	3.0E + 04			1.4E+01	1.5E+01	1.4E+01	1.4E+01	1.3E+01	1.5E+01
Cyanide	3.4E + 02								
Dysprosium	5.9E + 04								
Fluoride	3.9E + 03								
Iron	2.4E + 05			1.1E+04	1.4E+04	1.2E+04	1.2E+04	1.2E+04	1.3E+04
Lead	5.8E + 04			8.6E+00	1.0E+01	9.1E+00	6.6E+00	5.6E+00	8.7E+00
Magnesium	1.2E + 05			3.6E+03 J	5.0E+03 J	4.0E+03 J	4.8E+03	4.6E+03	4.5E+03
Manganese	4.9E + 03			1.7E+02	2.1E+02	1.8E+02	2.1E+02 J	1.8E+02 J	2.5E+02 J
Mercury	9.5E + 03		2.3E+01	2.8E-01	5.4E-01	1.6E-01	2.0E-01	4.3E-01	2.3E-01
Molybdenum	1.0E + 04								
Nickel	3.5E + 02			2.3E+01	2.2E+01	1.9E+01	2.0E+01	1.8E+01	2.3E+01
Nitrate	3.9E + 03								
Nitrate/Nitrite-N	3.3E + 04								
Nitrite	8.5E + 00								
Phosphate	3.30E+04								
Phosphorus	NA								
Potassium	4.3E + 04			9.1E+02 J	1.4E+03 J	1.1E+03 J	9.8E+02 J	8.3E+02 J	1.0E+03 J
Selenium	8.5E + 02			ND	ND	ND	ND	ND	ND
Silicon	3.30E+04								
Silver	9.8E + 03			ND	ND	ND	ND	ND	ND
Sodium	3.2E + 03			1.5E+02 B	1.7E+02 B	1.6E+02 B	2.2E+02 J	1.8E+02 BJ	2.0E+02 J
Strontium	1.8E + 04								
Sulfate	3.3E + 04								
Sulfide	3.3E + 04								
Terbium	NA								
Thallium	4.3E + 00			ND	ND	ND	ND	ND	ND
Tin	3.00E+03								

Table A-36. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a]		Remediation Goals (RGs) from ROD[b]	CPP-91 – 1 (mg/kg or pCi/g) Sample Depth (ft)			CPP-91 – 2 (mg/kg or pCi/g) Sample Depth (ft)		
	(mg/kg)	(pCi/g)	(mg/kg or pCi/g)	0 - 0.5	2.5 - 5	7.5 - 10	0 - 0.5	0.5 - 2.5	5 - 7.5
Vanadium	4.5E + 02			2.3E+01	3.0E+01	2.4E+01	2.6E+01	2.6E+01	2.7E+01
Ytterbium	NA								
Zinc	2.1E + 05			5.5E+01	7.0E+01	5.3E+01	5.7E+01	4.7E+01	5.9E+01
Zirconium	NA								
Radionuclides									
Ag-108m		8.0E + 05							
Am-241		1.0E + 04	2.9E+02						
Am-243		3.3E + 02							
Ba-137m		NA							
C-14		3.0E + 03							
Cd-113m		1.6E + 06							
Ce-144		1.8E + 03							
Co-57		3.7E + 03							
Co-60		1.9E + 08							
Cs-134		1.1E + 07							
Cs-137		2.3E + 12	2.3E+01	1.7E+01	6.3E+01	3.6E+01	5.6E+00	1.6E+01	1.4E+02
Eu-152		9.7E + 08	2.7E+02						
Eu-154		8.2E + 08	5.2E+03						
Eu-155		1.8E + 08							
H-3		5.0E + 07							
I-129		3.1E + 03							
K-40		2.4E + 05							
Kr-85		NA							
Np-237		6.4E + 05							
Pm-147		3.8E + 08							
Pu-238		1.0E + 07	6.7E+02						
Pu-239		6.7E + 06	2.5E+02						
Pu-240		1.5E + 06	2.5E+02						
Pu-241		6.4E + 07	5.6E+04						
Ra-226		4.7E + 05							
Ru-106		1.2E + 04							
Sb-125		9.3E + 06							
Sm-151		3.4E + 08							
Sr-90		3.5E + 12	2.2E+02			3.8E+01 J			
Tc-99		5.8E + 06							
Te-125m		2.3E + 06							
Th-228		1.6E + 04							
Th-230		1.4E + 04							
Th-232		1.7E + 04							
U-233		1.6E + 08							
U-234		6.0E + 06							
U-235		1.1E + 05							

Table A-36. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a]		Remediation Goals (RGs) from ROD[b]	CPP-91 – 1 (mg/kg or pCi/g) Sample Depth (ft)			CPP-91 – 2 (mg/kg or pCi/g) Sample Depth (ft)		
	(mg/kg)	(pCi/g)	(mg/kg or pCi/g)	0 - 0.5	2.5 - 5	7.5 - 10	0 - 0.5	0.5 - 2.5	5 - 7.5
U-236		2.0E + 05							
U-238		2.0E + 06							
Y-90		2.3E + 10							

NOTES: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
z. Duplicate sample result

ND - Not Detected (concentration reported was below the detection limit)
NA - Not Applicable

B - Sample result is greater than the instrument detection limit, but less than the contract required detection limit.
J - The sample concentration reported is an estimated value as a result of data validation.

Table A-37. CPP-93 - simulated calcine disposal trench.

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 93 - 1 (mg/kg or pCi/g) Sample Depth (ft) 2.5 - 4	CPP 93 - 2 (mg/kg or pCi/g) Sample Depth (ft) 2.5 - 3	CPP 93 - 3 (mg/kg or pCi/g) Sample Depth (ft) 2.5 - 3	CPP 93 - 4 (mg/kg or pCi/g) Sample Depth (ft) 6.5 - 7
Organics				NOT Analyzed			
Inorganics							
Aluminum	1.6E + 05			1.2E+05	1.3E+04	8.0E+04	7.4E+04
Antimony	5.8E + 03						
Arsenic	5.8E + 01						
Barium	3.0E + 03						
Beryllium	1.8E + 01						
Boron	3.3E + 03						
Cadmium	3.6E + 03						
Calcium	NA						
Chloride	3.3E + 04						
Chromium	4.1E + 04						
Cobalt	1.1E + 02						
Copper	3.0E + 04						
Cyanide	3.4E + 02						
Dysprosium	5.9E + 04						
Fluoride	3.9E + 03						
Iron	2.4E + 05						
Lead	5.8E + 04						
Magnesium	1.2E + 05						
Manganese	4.9E + 03						
Mercury	9.5E + 03		2.3E+01	6.8E+01	6.2E+00	9.8E+01	1.4E+02
Molybdenum	1.0E + 04						
Nickel	3.5E + 02						
Nitrate	3.9E + 03						
Nitrate/Nitrite-N	3.3E + 04			7.5E+01	1.4E+00	3.8E+00	1.9E+00
Nitrite	8.5E + 00						
Phosphate	3.30E+04						
Phosphorus	NA						
Potassium	4.3E + 04						
Selenium	8.5E + 02						
Silicon	3.30E+04						
Silver	9.8E + 03						
Sodium	3.2E + 03			4.3E+02	ND	ND	ND
Strontium	1.8E + 04						
Sulfate	3.3E + 04						
Sulfide	3.3E + 04						
Terbium	NA						
Thallium	4.3E + 00						

Table A-37. (continued).

Constituent[a]	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 93 - 1 (mg/kg or pCi/g) Sample Depth (ft) 2.5 - 4	CPP 93 - 2 (mg/kg or pCi/g) Sample Depth (ft) 2.5 - 3	CPP 93 - 3 (mg/kg or pCi/g) Sample Depth (ft) 2.5 - 3	CPP 93 - 4 (mg/kg or pCi/g) Sample Depth (ft) 6.5 - 7
Tin	3.00E+03						
Vanadium	4.5E + 02						
Ytterbium	NA						
Zinc	2.1E + 05						
Zirconium	NA						
Radionuclides				NOT Analyzed			

NOTE: Boxed & highlighted in pink indicates sample results are greater than associated RG

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center

ND - Non-Detect (value is below the minimum dection limit)
NA - Not Applicable

Table A-38. CPP-129 – soils under the CPP-637 and CPP-620 facilities.

Constituent	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 129 - 101 (mg/kg)	CPP 129 - 201 (mg/kg)	CPP 129 - 301 (mg/kg)	CPP 129 - 401 (mg/kg)	CPP 129 - 501 (mg/kg)	CPP 129 - 601 (mg/kg)	CPP 129 - 701 (mg/kg)	CPP 129 - 702[Z] (mg/kg)
Inorganics											
Aluminum	1.6E + 05			6.9E+03	7.3E+03	7.8E+03	7.3E+03	6.3E+03	7.3E+03	6.2E+03	6.2E+03
Antimony	5.8E + 03			4.9E-01 J	4.0E-01	5.0E-01 J	9.3E-01 J	4.8E-01 J	4.1E-01 J	3.7E-01 J	3.3E-01 J
Arsenic	5.8E + 01			7.8E+00	7.0E+00	7.6E+00	8.0E+00	7.5E+00	6.5E+00	7.3E+00	6.2E+00
Barium	3.0E + 03			1.67E+02 J	1.77E+02 J	1.74 E+02 J	1.75E+02 J	1.52E+02 J	1.71E+02 J	1.5E+02 J	1.59E+02 J
Beryllium	1.8E + 01			4.3E-01	5.3E-01	5.5E-01	4.5E-01	5.1E-01	5.4E-01	4.6E-01	3.7E-01
Boron	3.3E + 03										
Cadmium	3.6E + 03			8.2E-01	4.8E-01	6.7E-01	6.3E-01	4.0E-01	6.0E-01	3.5E-01	3.5E-01
Calcium	NA										
Chloride	3.3E + 04										
Chromium	4.1E + 04			1.61E+01 J	1.49E+01 J	1.65E+01 J	1.93E+01 J	1.55E+01 J	1.63E+01 J	1.52E+01 J	1.4E+01 J
Cobalt	1.1E + 02			5.6E+00	5.4E+00	5.8E+00	5.9E+00	5.3E+00	5.6E+00	5.1E+00	5.0E+00
Copper	3.0E + 04			1.63E+01 J	1.52E+01 J	2.18E+01 J	1.31E+01 J	1.57E+01 J	1.53E+01 J	1.59E+01 J	1.29E+01 J
Cyanide	3.4E + 02										
Dysprosium	5.9E + 04										
Fluoride	3.9E + 03										
Iron	2.4E + 05			1.3E+04	1.3E+04	1.5E+04	1.4E+04	1.3E+04	1.3E+04	1.3E+04	1.2E+04
Lead	5.8E + 04			1.4E+01	1.2E+01	2.0E+01	1.5E+02	1.1E+01	1.4E+01	1.0E+01	9.6E+00
Magnesium	1.2E + 05			6.26E+03 J	6.68E+03 J	6.88E+03 J	6.95E+03 J	6.18E+03 J	6.29E+03 J	5.43E+03 J	5.5E+03 J
Manganese	4.9E + 03			2.3E+02	2.4E+02	2.5E+02	2.3E+02	2.2E+02	2.7E+02	2.0E+02	2.1E+02
Mercury	9.5E + 03		2.3E+01	4.1E-02 J	4.1E-02 J	3.7E-02 J	3.7E-02 J	4.8E-02 J	3.5E-02 J	3.40E-02 J	3.10E-02 J
Molybdenum	1.0E + 04										
Nickel	3.5E + 02			2.6E+01 J	1.95E+01 J	2.28E+01 J	2.15E+01 J	1.98E+01 J	2.0E+01 J	1.78E+01 J	1.71E+01 J
Nitrate	3.9E + 03										
Nitrate/Nitrite-N	3.3E + 04										
Nitrite	8.5E + 00										
Phosphate	3.30E+04										
Phosphorus	NA										
Potassium	4.3E + 04			1.3E+03	1.4E+03	1.4E+03	1.4E+03	1.1E+03	1.4E+03	1.0E+03	1.1E+03
Selenium	8.5E + 02			7.9E-01	2.2E-01	3.3E-01	2.2E-01	2.5E-01	2.4E-01	2.8E-01	2.3E-01
Silicon	3.30E+04										
Silver	9.8E + 03			2.6E-01	2.6E-01	3.2E-01	3.0E-01	2.4E-01	3.1E-01	2.2E-01	2.5E-01
Sodium	3.2E + 03			2.4E+02	1.6E+02	2.4E+02	3.5E+02	1.4E+02	2.2E+02	1.8E+02	1.6E+02
Strontium	1.8E + 04										
Sulfate	3.3E + 04										
Sulfide	3.3E + 04										
Terbium	NA										
Thallium	4.3E + 00			ND	ND	ND	ND	ND	ND	9.4E-02 J	8.1E-02
Tin	3.00E+03										

Table A-38. (continued).

Constituent	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 129 - 101 (mg/kg)	CPP 129 - 201 (mg/kg)	CPP 129 - 301 (mg/kg)	CPP 129 - 401 (mg/kg)	CPP 129 - 501 (mg/kg)	CPP 129 - 601 (mg/kg)	CPP 129 - 701 (mg/kg)	CPP 129 - 702[z] (mg/kg)
Vanadium	4.5E + 02			2.29E+01 J	2.24E+01 J	2.45E+01 J	2.40E+01 J	2.33E+01 J	2.19E+01 J	2.58E+01 J	2.15E+01 J
Ytterbium	NA										
Zinc	2.1E + 05			8.66E+01 J	1.16E+02 J	9.19E+01 J	1.1E+02 J	5.75E+01 J	8.59E+01 J	5.72E+01 J	5.46E+01 J
Zirconium	NA										

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
J - The sample concentration reported is an estimated value as a result of data validation.
ND - Non-Detect (value is below the minimum dection limit)
NA - Not Applicable
z. Duplicate sample resultND - Not Detected (concentration reported was below the detection limit)

Table A-39. CPP-129 – soils under the CPP-637 and CPP-620 facilities.

Constituent	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 129 - 801 (mg/kg)	CPP 129 - 802[Z] (mg/kg)	CPP 129 - 901 (mg/kg)	CPP 129 - 1001 (mg/kg)	CPP 129 - 1101 (mg/kg)	CPP 129 - 1201 (mg/kg)	CPP 129 - 1301 (mg/kg)	CPP 129 - 1401 (mg/kg)
Inorganics											
Aluminum	1.6E + 05			5.3E+03	5.2E+03	3.08E+03 J	4.1E+03 J	2.88E+03 J	3.05E+03 J	6.37E+03 J	3.68E+03 J
Antimony	5.8E + 03			2.9E-01 J	3.1E-01 J	3.9E-01	3.1E-01	3.1E-01	3.3E-01	6.1E-01	3.6E-01
Arsenic	5.8E + 01			6.5E+00	6.6E+00	5.5E+00	6.6E+00	5.2E+00	7.1E+00	7.1E+00	8.6E+00
Barium	3.0E + 03			1.2E+02	1.2E+02	8.2E+01	8.5E+01	5.8E+01	6.5E+01	1.5E+02	8.7E+01
Beryllium	1.8E + 01			3.8E-01	3.4E-01	2.8E-01	3.3E-01	2.9E-01	2.7E-01	5.5E-01	3.4E-01
Boron	3.3E + 03										
Cadmium	3.6E + 03			3.3E-01	3.3E-01	2.9E-01	3.5E-01	2.5E-01	2.2E-01	1.0E+00	2.8E-01
Calcium	NA			1.7E+04	3.3E+04	3.1E+04	1.9E+04	2.5E+04	2.1E+04	3.8E+04	3.0E+04
Chloride	3.3E + 04										
Chromium	4.1E + 04			1.2E+01	1.2E+01	1.17E+01 J	1.39E+01 J	1.02E+01 J	1.21E+01 J	1.9E+01 J	1.36E+01 J
Cobalt	1.1E + 02			4.5E+00	3.9E+00	4.0E+00	4.5E+00	3.8E+00	3.8E+00	6.2E+00	4.2E+00
Copper	3.0E + 04			1.22E+01 J	1.19E+01 J	1.1E+01	1.4E+01	9.1E+00	1.1E+01	1.6E+01	1.2E+01
Cyanide	3.4E + 02										
Dysprosium	5.9E + 04										
Fluoride	3.9E + 03										
Iron	2.4E + 05			1.13E+04 J	1.0E+04 J	8.81E+03 J	9.68E+03 J	7.73E+03 J	9.19E+03 J	1.38E+04 J	1.02E+04 J
Lead	5.8E + 04			9.5E+00	8.1E+00	7.3E+00	8.3E+00	7.5E+00	7.2E+00	2.1E+01	7.3E+00
Magnesium	1.2E + 05			4.3E+03	4.3E+03	3.11E+03 J	3.58E+03 J	2.89E+03 J	3.08E+03 J	5.43E+03 J	3.40E+03 J
Manganese	4.9E + 03			1.9E+02	1.6E+02	1.5E+02	1.3E+02	1.3E+02	1.2E+02	2.5E+02	1.8E+02
Mercury	9.5E + 03		2.3E+01	2.3E-02	ND	ND	ND	ND	ND	ND	ND
Molybdenum	1.0E + 04										
Nickel	3.5E + 02			1.7E+01	1.5E+01	1.4E+01	1.6E+01	1.3E+01	1.4E+01	2.2E+01	1.6E+01
Nitrate	3.9E + 03										
Nitrate/Nitrite-N	3.3E + 04										
Nitrite	8.5E + 00										
Phosphate	3.30E+04										
Phosphorus	NA										
Potassium	4.3E + 04			1.1E+03	1.1E+03	4.94E+02 J	6.52E+02 J	4.98E+02 J	5.19E+02 J	1.24E+03 J	5.71E+02 J
Selenium	8.5E + 02			2.9E-01	1.6E-01	4.1E-01	4.1E-01	2.6E-01	2.9E-01	3.8E-01	3.4E-01
Silicon	3.30E+04										
Silver	9.8E + 03			1.8E-01	2.0E-01	1.5E-01	2.3E-01	1.3E-01	1.6E-01	2.9E-01	1.4E-01
Sodium	3.2E + 03			2.2E+02	2.7E+02	1.1E+02	2.0E+02	9.3E+01	9.6E+01	2.2E+02	7.8E+01
Strontium	1.8E + 04										
Sulfate	3.3E + 04										
Sulfide	3.3E + 04										
Terbium	NA										
Thallium	4.3E + 00			8.2E-02	8.1E-02	ND	ND	8.0E-02	8.0E-02	8.1E-02	7.9E-02

Table A-39. (continued).

Constituent	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 129 - 801 (mg/kg)	CPP 129 - 802[z] (mg/kg)	CPP 129 - 901 (mg/kg)	CPP 129 - 1001 (mg/kg)	CPP 129 - 1101 (mg/kg)	CPP 129 - 1201 (mg/kg)	CPP 129 - 1301 (mg/kg)	CPP 129 - 1401 (mg/kg)
Tin	3.00E+03										
Vanadium	4.5E + 02			2.0E+01	1.9E+01	2.2E+01	2.3E+01	1.7E+01	2.3E+01	2.6E+01	2.2E+01
Ytterbium	NA										
Zinc	2.1E + 05			4.97E+01 J	4.21E+01 J	4.11E+01 J	4.77E+01 J	3.67E+01 J	3.78E+01 J	7.55E+01 J	4.66E+01 J
Zirconium	NA										

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
J - The sample concentration reported is an estimated value as a result of data validation.
ND - Non-Detect (value is below the minimum dection limit)
NA - Not Applicable
z. Duplicate sample resultND - Not Detected (concentration reported was below the detection limit)

Table A-40. CPP-129 – soils under the CPP-637 and CPP-620 facilities.

	Selected ICDF WAC Concentration Guideline[a]		Remediation Goals (RGs) from ROD[b]	CPP 129 - 1501	CPP 129 - 1601	CPP 129 - 1701	CPP 129 - 1801	CPP 129 - 1901	CPP 129 - 2001	CPP 129 - 2101	CPP 129 - 2201
Constituent	(mg/kg)	(pCi/g)	(mg/kg or pCi/g)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Inorganics											
Aluminum	1.6E + 05			4.53E+03 J	3.15E+03 J	6.37E+03 J	2.88E+03 J	3.38E+03 J	5.0E+03 J	6.69E+03 J	4.37E+03 J
Antimony	5.8E + 03			3.7E-01	2.9E-01	5.0E-01	2.9E-01	4.0E-01	5.2E-01	5.2E-01	4.0E-01
Arsenic	5.8E + 01			5.9E+00	6.1E+00	1.5E+01	5.9E+00	7.7E+00	6.7E+00	1.0E+01	6.6E+00
Barium	3.0E + 03			1.0E+02	7.6E+01	1.5E+02	7.3E+01	6.9E+01	1.4E+02	1.8E+02	1.1E+02
Beryllium	1.8E + 01			3.2E-01	2.9E-01	5.1E-01	2.7E-01	2.8E-01	3.8E-01	5.9E-01	3.7E-01
Boron	3.3E + 03										
Cadmium	3.6E + 03			3.3E-01	3.3E-01	6.6E-01	1.8E-01	2.3E-01	1.7E+00	5.7E-01	3.2E-01
Calcium	NA			1.6E+04	7.2E+04	3.0E+04	1.5E+04	3.0E+04	4.4E+04	2.5E+04	2.4E+04
Chloride	3.3E + 04										
Chromium	4.1E + 04			1.41E+01 J	1.53E+1 J	2.1E+01 J	1.26E+01 J	1.23E+01 J	1.53E+01 J	1.82E+01 J	1.49E+01 J
Cobalt	1.1E + 02			4.7E+00	3.7E+00	6.1E+00	3.6E+00	4.4E+00	4.6E+00	7.3E+00	5.1E+00
Copper	3.0E + 04			1.1E+01	1.1E+01	1.5E+01	1.0E+01	1.2E+01	1.3E+01	1.8E+01	1.4E+01
Cyanide	3.4E + 02										
Dysprosium	5.9E + 04										
Fluoride	3.9E + 03										
Iron	2.4E + 05			9.86E+03 J	8.7E+03 J	1.35E+04 J	8.34E+03 J	9.65E+03 J	1.14E+04 J	1.54E+04 J	1.11E+04 J
Lead	5.8E + 04			9.2E+00	7.4E+00	1.4E+01	6.3E+00	1.2E+01	1.0E+01	1.4E+01	1.2E+01
Magnesium	1.2E + 05			3.59E+03 J	3.72E+03 J	5.13E+03 J	2.8E+03 J	3.32E+03 J	3.77E+03 J	6.17E+03 J	4.04E+03 J
Manganese	4.9E + 03			1.9E+02	1.2E+02	2.5E+02	1.1E+02	1.3E+02	1.8E+02	3.4E+02	1.8E+02
Mercury	9.5E + 03		2.3E+01	ND	7.4E-03	ND	ND	ND	ND	ND	ND
Molybdenum	1.0E + 04										
Nickel	3.5E + 02			1.6E+01	1.5E+01	2.3E+01	1.2E+01	1.5E+01	1.8E+01	2.6E+01	1.8E+01
Nitrate	3.9E + 03										
Nitrate/Nitrite-N	3.3E + 04										
Nitrite	8.5E + 00										
Phosphate	3.30E+04										
Phosphorus	NA										
Potassium	4.3E + 04			7.57E+02 J	5.52E+02 J	1.32E+03 J	4.81E+02 J	5.63E+02 J	9.88E+02 J	1.33E+03 J	7.84E+02 J
Selenium	8.5E + 02			3.6E-01	3.2E-01	1.2E-01	2.5E-01	3.6E-01	1.0E-01	3.9E-01	3.2E-01
Silicon	3.30E+04										
Silver	9.8E + 03			1.5E-01	1.6E-01	3.3E-01	1.3E-01	2.2E-01	2.0E-01	2.9E-01	2.0E-01
Sodium	3.2E + 03			1.4E+02	1.3E+02	1.9E+02	8.3E+01	1.1E+02	1.9E+02	2.8E+02	1.1E+02
Strontium	1.8E + 04										
Sulfate	3.3E + 04										
Sulfide	3.3E + 04										

Table A-40. (continued).

Constituent	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 129 - 1501 (mg/kg)	CPP 129 - 1601 (mg/kg)	CPP 129 - 1701 (mg/kg)	CPP 129 - 1801 (mg/kg)	CPP 129 - 1901 (mg/kg)	CPP 129 - 2001 (mg/kg)	CPP 129 - 2101 (mg/kg)	CPP 129 - 2201 (mg/kg)
Terbium	NA										
Thallium	4.3E + 00			8.1E-02	8.0E-02	ND	8.0E-02	7.9E-02	8.1E-02	8.5E-02	7.9E-02
Tin	3.00E+03										
Vanadium	4.5E + 02			1.9E+01	2.2E+01	2.4E+01	1.9E+01	2.1E+01	2.5E+01	3.1E+01	2.5E+01
Ytterbium	NA										
Zinc	2.1E + 05			5.0E+01	3.91E+01 J	6.76E+01 J	3.38E+01 J	4.29E+01 J	5.9E+01 J	7.64E+01 J	8.48E+01 J
Zirconium	NA										

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
J - The sample concentration reported is an estimated value as a result of data validation.
ND - Non-Detect (value is below the minimum dection limit)
NA - Not Applicable

Table A-41. CPP-129 – soils under the CPP-637 and CPP-620 facilities.

Constituent	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 129 - 2301 (mg/kg)	CPP 129 - 2401 (mg/kg)	CPP 129 - 2402[Z] (mg/kg)	CPP 129 - 2501 (mg/kg)	CPP 129 - 2502[Z] (mg/kg)	CPP 129 - 2601 (mg/kg)	CPP 129 - 2701 (mg/kg)	CPP 129 - 2801 (mg/kg)
Inorganics											
Aluminum	1.6E + 05			4.09E+03 J	3.92E+03 J	4.86E+03 J	3.8E+03 J	4.13E+03 J	4.88E+03 J	7.1E+03	4.06E+03 J
Antimony	5.8E + 03			4.2E-01	3.7E-01	4.2E-01	4.6E-01 J	5.2E-01 J	4.3E-01 J	4.4E-01	3.2E-01 J
Arsenic	5.8E + 01			8.8E+00	7.1E+00	8.0E+00	7.2E+00	6.5E+00	6.2E+00	7.2E+00	6.0E+00
Barium	3.0E + 03			1.0E+02	9.0E+01	1.1E+02	9.1E+01	1.3E+02	1.0E+02	1.7E+02	8.5E+01
Beryllium	1.8E + 01			3.7E-01	3.3E-01	3.6E-01	3.0E-01	2.8E-01	3.8E-01	5.3E-01	3.4E-01
Boron	3.3E + 03										
Cadmium	3.6E + 03			2.9E-01	5.9E+00	4.4E+00	3.3E-01	2.9E-01	3.1E-01	5.0E-01	3.3E-01
Calcium	NA			1.7E+04	5.0E+04	4.1E+04	2.1E+04	2.0E+04	2.4E+04	2.5E+04	1.4E+04
Chloride	3.3E + 04										
Chromium	4.1E + 04			1.42E+01 J	1.51E+01 J	1.68E+01 J	1.4E+01	1.4E+01	1.6E+01	1.6E+01	1.1E+01
Cobalt	1.1E + 02			6.1E+00	4.7E+00	5.8E+00	4.0E+00	4.0E+00	4.6E+00	5.9E+00	4.1E+00
Copper	3.0E + 04			1.5E+01	1.3E+01	1.5E+01	1.11E+01 J	1.05E+01 J	1.27E+01 J	1.4E+01	1.02E+01 J
Cyanide	3.4E + 02										
Dysprosium	5.9E + 04										
Fluoride	3.9E + 03										
Iron	2.4E + 05			1.20E+04 J	9.85E+03 J	1.2E+04 J	9.87E+03 J	9.93E+03 J	1.08E+04 J	1.4E+04	9.79E+03 J
Lead	5.8E + 04			1.1E+01	9.7E+00	1.0E+01	7.7E+00	8.6E+00	9.3E+00	1.4E+01	9.9E+00
Magnesium	1.2E + 05			4.56E+03 J	3.81E+03 J	4.64E+03 J	4.16E+03 J	4.36E+03 J	4.59E+03 J	6.3E+03	3.63E+03 J
Manganese	4.9E + 03			2.2E+02	1.6E+02	2.1E+02	1.32E+02 J	1.23E+02 J	1.64E+02 J	2.4E+02	2.06E+02 J
Mercury	9.5E + 03		2.3E+01	ND	ND	7.4E-03	ND	ND	ND	9.4E-02	ND
Molybdenum	1.0E + 04										
Nickel	3.5E + 02			1.8E+01	1.8E+01	2.0E+01	1.5E+01	1.6E+01	1.8E+01	2.0E+01	1.7E+01
Nitrate	3.9E + 03										
Nitrate/Nitrite-N	3.3E + 04										
Nitrite	8.5E + 00										
Phosphate	3.30E+04										
Phosphorus	NA										
Potassium	4.3E + 04			7.49E+02 J	6.47E+02 J	7.75E+02 J	5.99E+02 J	6.63E+02 J	8.41E+02 J	1.3E+03	5.69E+02 J
Selenium	8.5E + 02			3.1E-01	3.1E-01	3.5E-01				4.2E-01	
Silicon	3.30E+04										
Silver	9.8E + 03			2.0E-01	2.1E-01	2.3E-01	2.9E-01	2.0E-01	2.0E-01	2.8E-01	1.3E-01
Sodium	3.2E + 03			1.4E+02	9.8E+01	1.2E+02	1.9E+02	2.0E+02	2.2E+02	1.9E+02	1.3E+02
Strontium	1.8E + 04										
Sulfate	3.3E + 04										
Sulfide	3.3E + 04										
Terbium	NA										

Table A-41. (continued).

Constituent	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 129 - 2301 (mg/kg)	CPP 129 - 2401 (mg/kg)	CPP 129 - 2402[Z] (mg/kg)	CPP 129 - 2501 (mg/kg)	CPP 129 - 2502[Z] (mg/kg)	CPP 129 - 2601 (mg/kg)	CPP 129 - 2701 (mg/kg)	CPP 129 - 2801 (mg/kg)
Thallium	4.3E + 00			8.0E-02	7.9E-02	8.0E-02	ND	7.8E-02	ND	8.2E-02	7.9E-02
Tin	3.00E+03										
Vanadium	4.5E + 02			2.3E+01	2.3E+01	2.5E+01	2.3E+01	2.2E+01	2.6E+01	2.4E+01	1.9E+01
Ytterbium	NA										
Zinc	2.1E + 05			4.84E+01 J	5.53E+01 J	6.55E+01 J	4.32E+01 J	4.45E+01 J	4.98E+01 J	7.3E+01	4.34E+01 J
Zirconium	NA										

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
z. Duplicate sample result
ND - Non-Detect (value is below the minimum dection limit)
NA - Not Applicablea. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
J - The sample concentration reported is an estimated value as a result of data validation.

Table A-42. CPP-129 – soils under the CPP-637 and CPP-620 facilities.

Constituent	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 129 - 2901 (mg/kg)	CPP 129 - 3001 (mg/kg)	CPP 129 - 3101 (mg/kg)	CPP 129 - 3201 (mg/kg)	CPP 129 - 3401 (mg/kg)	CPP 129 - 3501 (mg/kg)	CPP 129 - 3601 (mg/kg)
Inorganics										
Aluminum	1.6E + 05			5.12E+03 J	3.4E+03	4.7E+03	4.2E+03	3.68E+03 J	3.97E+03 J	5.67E+03 J
Antimony	5.8E + 03			3.9E-01 J	2.6E-01 J	3.5E-01 J	2.8E-01 J	3.6E-01	3.2E-01	4.9E-01
Arsenic	5.8E + 01			5.6E+00	4.7E+00	7.0E+00	6.1E+00	5.7E+00	7.3E+00	8.8E+00
Barium	3.0E + 03			9.6E+01	7.3E+01	9.7E+01	8.6E+01	6.8E+01	8.7E+01	1.3E+02
Beryllium	1.8E + 01			3.3E-01	2.3E-01	4.2E-01	3.1E-01	3.0E-01	3.0E-01	4.6E-01
Boron	3.3E + 03									
Cadmium	3.6E + 03			2.4E-01	1.9E-01	2.7E-01	2.2E-01	2.4E-01	4.9E-01	4.9E-01
Calcium	NA			1.8E+04	1.8E+04	1.3E+04	2.4E+04	1.7E+04	2.2E+04	2.3E+04
Chloride	3.3E + 04									
Chromium	4.1E + 04			1.8E+01	9.0E+00	1.4E+01	1.1E+01	1.45E+01 J	1.66E+01 J	1.82E+01 J
Cobalt	1.1E + 02			5.4E+00	2.9E+00	4.5E+00	3.9E+00	4.2E+00	4.5E+00	7.4E+00
Copper	3.0E + 04			1.35E+01 J	8.3E+00 J	1.41E+01 J	1.17E+01 J	1.2E+01	1.3E+01	1.6E+01
Cyanide	3.4E + 02									
Dysprosium	5.9E + 04									
Fluoride	3.9E + 03									
Iron	2.4E + 05			1.15E+04 J	7.43E+03 J	1.07E+04 J	9.04E+03 J	9.58E+03 J	1.05E+04 J	1.36E+04 J
Lead	5.8E + 04			8.0E+00	5.8E+00	8.2E+00	7.5E+00	7.7E+00	8.4E+00	1.1E+01
Magnesium	1.2E + 05			4.88E+03 J	2.7E+03	4.0E+03	3.7E+03	3.48E+03 J	3.97E+03 J	5.21E+03 J
Manganese	4.9E + 03			1.84E+02 J	1.2E+02	1.9E+02	1.4E+02	1.3E+02	1.6E+02	2.1E+02
Mercury	9.5E + 03		2.3E+01	ND	7.8E-02	ND	ND	ND	ND	ND
Molybdenum	1.0E + 04									
Nickel	3.5E + 02			1.8E+01	1.1E+01	1.7E+01	1.2E+01	1.6E+01	1.8E+01	2.3E+01
Nitrate	3.9E + 03									
Nitrate/Nitrite-N	3.3E + 04									
Nitrite	8.5E + 00									
Phosphate	3.30E+04									
Phosphorus	NA									
Potassium	4.3E + 04			5.92E+02 J	5.5E+02	7.1E+02	6.9E+02	5.62E+02 J	6.46E+02 J	9.23E+02 J

Table A-42. (continued).

Constituent	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 129 - 2901 (mg/kg)	CPP 129 - 3001 (mg/kg)	CPP 129 - 3101 (mg/kg)	CPP 129 - 3201 (mg/kg)	CPP 129 - 3401 (mg/kg)	CPP 129 - 3501 (mg/kg)	CPP 129 - 3601 (mg/kg)
Selenium	8.5E + 02				1.6E-01	2.9E-01	2.5E-01	2.3E-01	2.5E-01	2.7E-01
Silicon	3.30E+04									
Silver	9.8E + 03			1.7E-01	1.1E-01	1.8E-01	2.4E-01	1.3E-01	1.8E-01	2.2E-01
Sodium	3.2E + 03			1.2E+02	9.1E+01	1.6E+02	1.7E+02	1.1E+02	1.4E+02	1.7E+02
Strontium	1.8E + 04									
Sulfate	3.3E + 04									
Sulfide	3.3E + 04									
Terbium	NA									
Thallium	4.3E + 00			ND	ND	ND	8.2E-02	8.0E-02	8.0E-02	ND
Tin	3.00E+03									
Vanadium	4.5E + 02			2.5E+01	1.6E+01	2.3E+01	1.8E+01	2.2E+01	2.6E+01	2.8E+01
Ytterbium	NA									
Zinc	2.1E + 05			4.38E+01 J	3.06E+01 J	4.46E+01 J	3.27E+01 J	4.23E+01 J	4.51E+01 J	6.68E+01 J
Zirconium	NA									

a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
J - The sample concentration reported is an estimated value as a result of data validation.
ND - Non-Detect (value is below the minimum dection limit)
NA - Not Applicable

Table A-43. CPP-129 – soils under the CPP-637 and CPP-620 facilities.

Constituent	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 129 - 3901 (mg/kg)	CPP 129 - 4001 (mg/kg)	CPP 129 - 4101 (mg/kg)
Inorganics						
Aluminum	1.6E + 05			8.1E+03 J	7.4E+03 J	7.5E+03 J
Antimony	5.8E + 03			6.3E-01 J	4.5E-01 J	4.5E-01 J
Arsenic	5.8E + 01			7.1E+00	7.1E+00	6.6E+00
Barium	3.0E + 03			2.0E+02	1.9E+02	1.8E+02
Beryllium	1.8E + 01			5.2E-01	5.3E-01	5.3E-01
Boron	3.3E + 03					
Cadmium	3.6E + 03			6.7E-01	1.8E+00	1.8E+00
Calcium	NA			3.4E+04	2.8E+04	2.6E+04
Chloride	3.3E + 04					
Chromium	4.1E + 04			2.0E+01	1.7E+01	1.7E+01
Cobalt	1.1E + 02			6.2E+00	6.2E+00	6.0E+00
Copper	3.0E + 04			1.6E+01 J	1.4E+01 J	1.5E+01 J
Cyanide	3.4E + 02					
Dysprosium	5.9E + 04					
Fluoride	3.9E + 03					
Iron	2.4E + 05			1.4E+04 J	1.3E+04 J	1.3E+04 J
Lead	5.8E + 04			1.9E+01	1.5E+01	1.6E+01
Magnesium	1.2E + 05			6.3E+03 J	6.0E+03 J	6.0E+03 J
Manganese	4.9E + 03			2.7E+02 J	2.7E+02 J	2.6E+02 J
Mercury	9.5E + 03		2.3E+01	ND	ND	ND
Molybdenum	1.0E + 04					
Nickel	3.5E + 02			2.3E+01	2.1E+01	2.1E+01
Nitrate	3.9E + 03					
Nitrate/Nitrite-N	3.3E + 04					
Nitrite	8.5E + 00					
Phosphate	3.30E+04					
Phosphorus	NA					
Potassium	4.3E + 04			1.5E+03 J	1.4E+03 J	1.5E+03 J
Selenium	8.5E + 02					
Silicon	3.30E+04					
Silver	9.8E + 03			3.2E-01	3.0E-01	2.9E-01
Sodium	3.2E + 03			2.5E+02	2.3E+02	2.2E+02
Strontium	1.8E + 04					
Sulfate	3.3E + 04					
Sulfide	3.3E + 04					

Table A-43. (continued).

Constituent	Selected ICDF WAC Concentration Guideline[a] (mg/kg)	(pCi/g)	Remediation Goals (RGs) from ROD[b] (mg/kg or pCi/g)	CPP 129 - 3901 (mg/kg)	CPP 129 - 4001 (mg/kg)	CPP 129 - 4101 (mg/kg)
Terbium	NA					
Thallium	4.3E + 00			ND	7.9E-02	8.0E-02
Tin	3.00E+03					
Vanadium	4.5E + 02			2.5E+01	2.3E+01	2.1E+01
Ytterbium	NA					
Zinc	2.1E + 05			8.3E+01 J	7.5E+01 J	7.5E+01 J
Zirconium	NA					

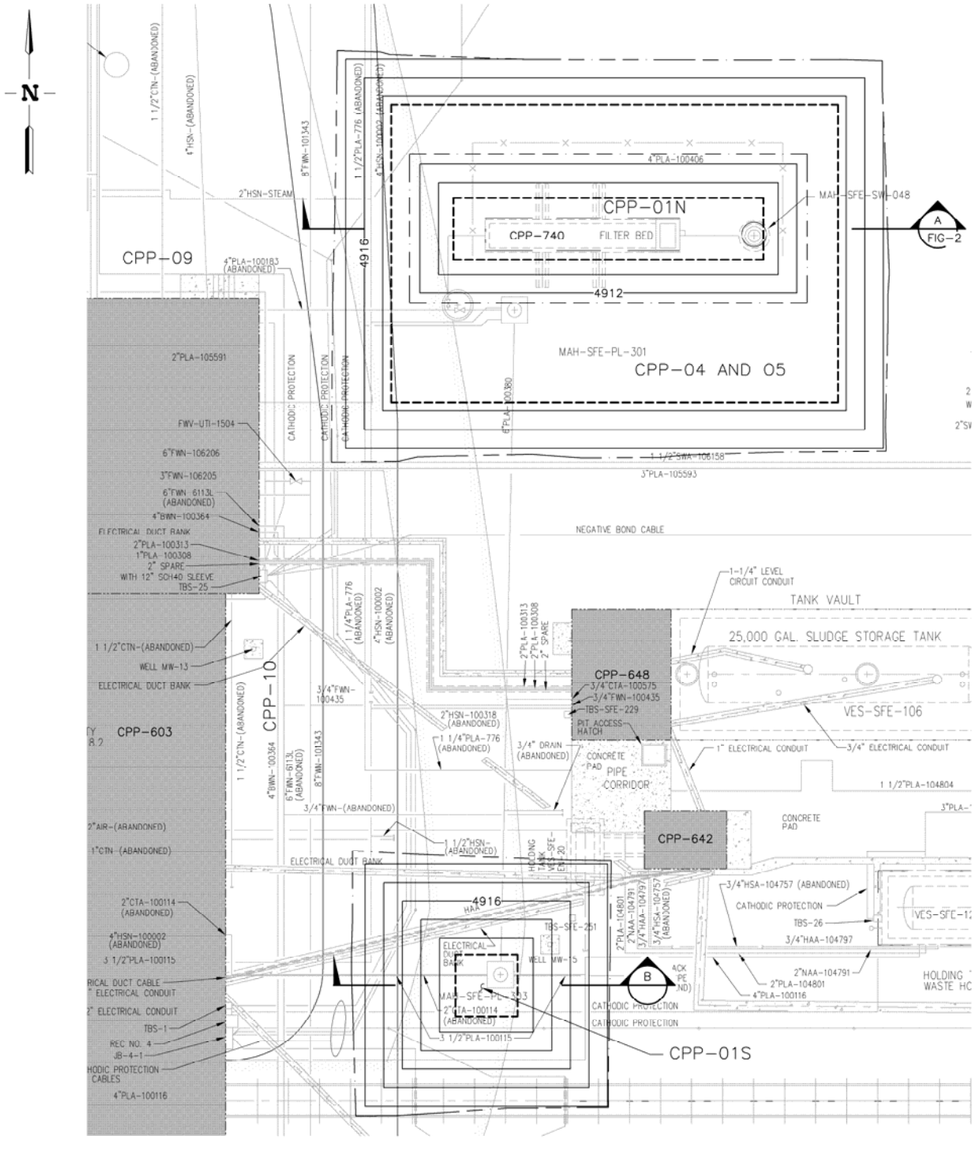
a. DOE/ID-10881, Revision 2, Waste Acceptance Criteria for ICDF Landfill
b. DOE/ID-10660, Revision 0, Final Record of Decision, Idaho Nuclear Technology and Engineering Center
J - The sample concentration reported is an estimated value as a result of data validation.
ND - Non-Detect (value is below the minimum dection limit)
NA - Not Applicable

Appendix B

Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 4-6 (Phase II) Design Figures

Appendix B

Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 4-6 (Phase II) Design Figures



EXCAVATION PLAN FOR CPP-01, 04 AND 05
SCALE: 1"=10.0'

FIGURE-1

PRELIMINARY
NOT RELEASED - NOT APPROVED FOR CONSTRUCTION

REV	DATE	DESCRIPTION

REVISION HISTORY

10' 5' 0 10'
SCALE: 1" = 10.0'

DESIGN PHASE:	PRELIMINARY
SAFETY CATEGORY:	CG
HORIZONTAL SCALE	1"=10.0'
VERTICAL SCALE	N/A
FOR DRAWING INDEX SEE DRAWING NO.	N/A

INITIALS AND DATE FOR CURRENT RELEASE ONLY

	INITIALS	DATE
DESIGN: K.D. FRITZ	N/A	N/A
DRAFTER: chris kneller	N/A	N/A
DRAFTING CHECK: N/A	N/A	N/A
TECHNICAL CHECK: N/A	N/A	N/A
ENG GROUP SUPERVISOR: N/A	N/A	N/A
DESIGN PROJECT ENG: C.J. HURST	N/A	N/A

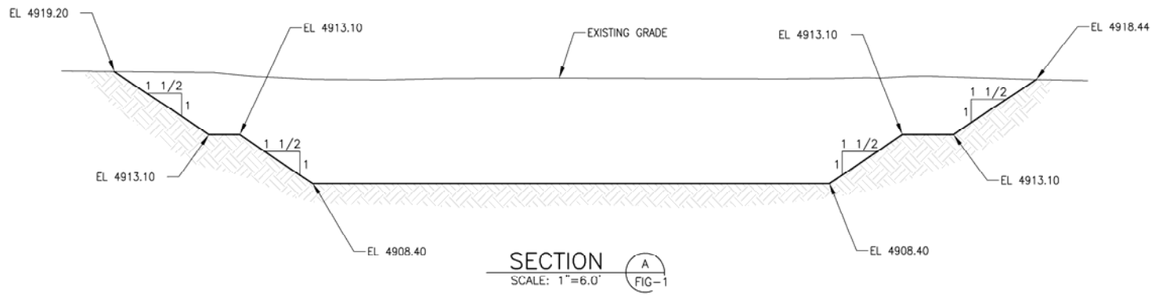
CHEMWEST
Idaho Cleanup Project
INTEC
EXCAVATION PLAN FOR CPP-01, 04 AND 05

PROJECT NO.	23083
SPCL CODE:	N/A
EFFECTIVE DATE:	N/A

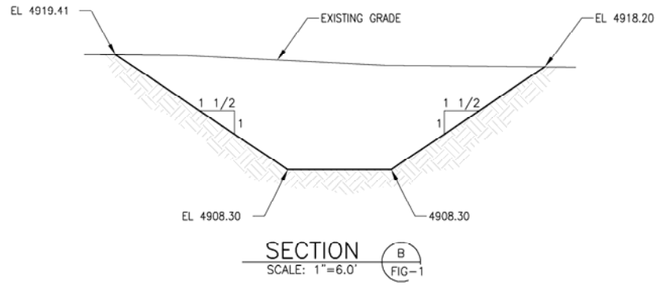
INDEX CODE NUMBER			
AREA	TYPE	FL	DISC
200	0100	02	136

SIZE D DWG- N/A REV

DAR NO. N/A SHEET FIG-1



SECTION
SCALE: 1"=6.0'
A
FIG-1



SECTION
SCALE: 1"=6.0'
B
FIG-1

FIGURE-2

REV	DATE	DESCRIPTION

REVISION HISTORY

6" 4" 2" 0 6"
SCALE: 1" = 6.0'

DESIGN PHASE:	PRELIMINARY
SAFETY CATEGORY:	CG
HORIZONTAL SCALE	1"=6.0'
VERTICAL SCALE	N/A
FOR DRAWING INDEX SEE DRAWING NO.	N/A

INITIALS AND DATE FOR CURRENT RELEASE ONLY

	INITIALS	DATE
DESIGN: K.D. FRITZ	N/A	N/A
DRAFTER:	N/A	N/A
DRAFTING CHECK: N/A	N/A	N/A
TECHNICAL CHECK: N/A	N/A	N/A
ENG GROUP SUPERVISOR: N/A	N/A	N/A
DESIGN PROJECT ENG: C.J. HURST	N/A	N/A

CHEM•NUCLEAR SYSTEMS, LLC

Idaho Cleanup Project

INTEC

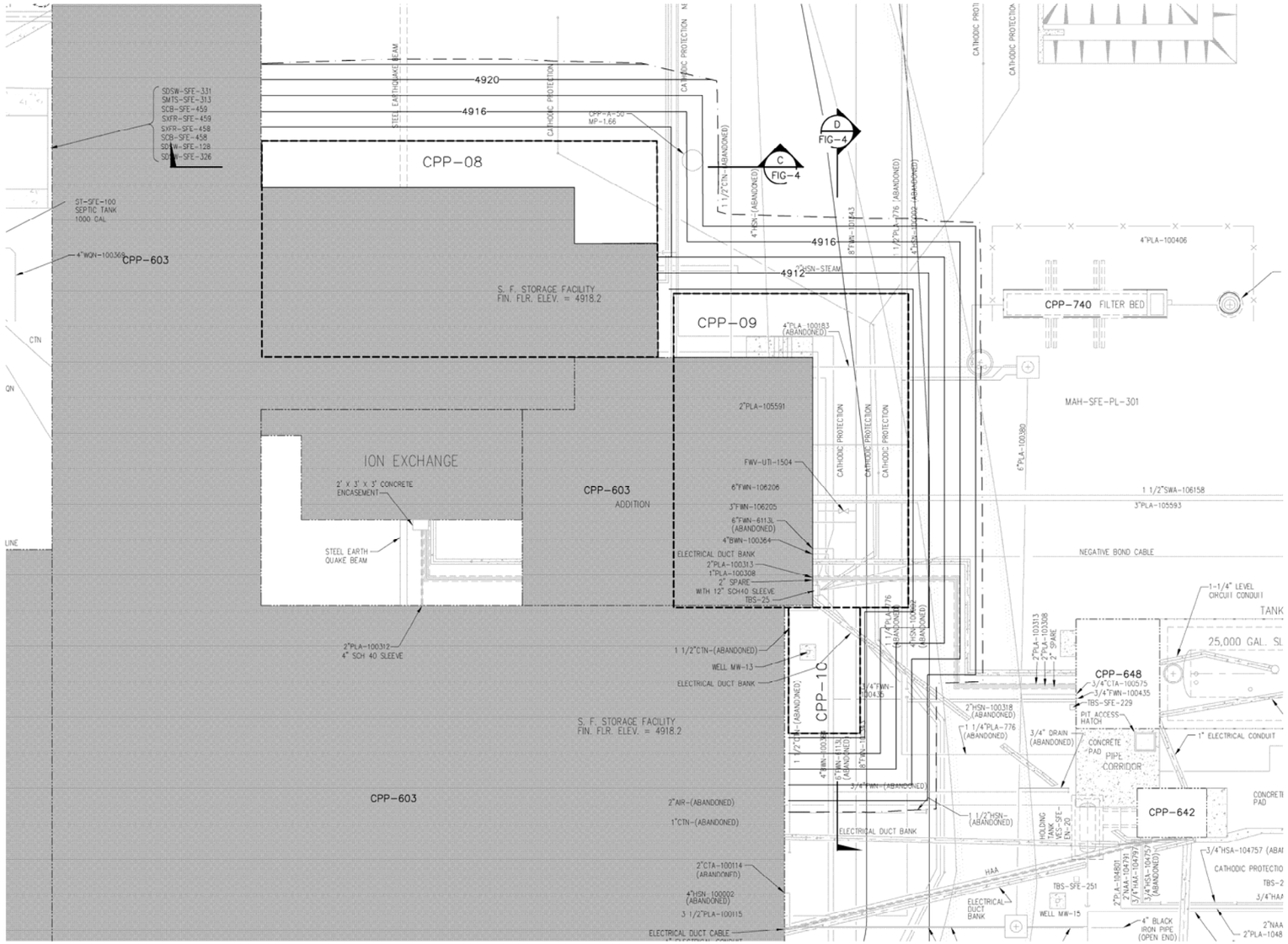
CPP-01, 04 AND 05 SECTIONS

PROJECT NO.	23083
SPCL CODE:	N/A
EFFECTIVE DATE:	N/A

INDEX CODE NUMBER			
AREA	TYPE	CL	SEQ
200	0100	02	136

SIZE D | DWG- N/A | REV

DAR NO. N/A | SHEET FIG-2



EXCAVATION PLAN FOR CPP-08, 09 AND 10
SCALE: 1"=10.0'

FIGURE-3

REV	DATE	DESCRIPTION
REVISION HISTORY		

SCALE: 1" = 10.0'

DESIGN PHASE:	PRELIMINARY
SAFETY CATEGORY:	CG
HORIZONTAL SCALE	1"=10.0'
VERTICAL SCALE	N/A
FOR DRAWING INDEX SEE DRAWING NO.	N/A

INITIALS AND DATE FOR CURRENT RELEASE ONLY

	INITIALS	DATE
DESIGN: K.D. FRITZ	N/A	N/A
DRAFTER:	N/A	N/A
DRAFTING CHECK: N/A	N/A	N/A
TECHNICAL CHECK: N/A	N/A	N/A
ENG GROUP SUPERVISOR: N/A	N/A	N/A
DESIGN PROJECT ENG: C.J. HURST	N/A	N/A

Idaho Cleanup Project — INTEC

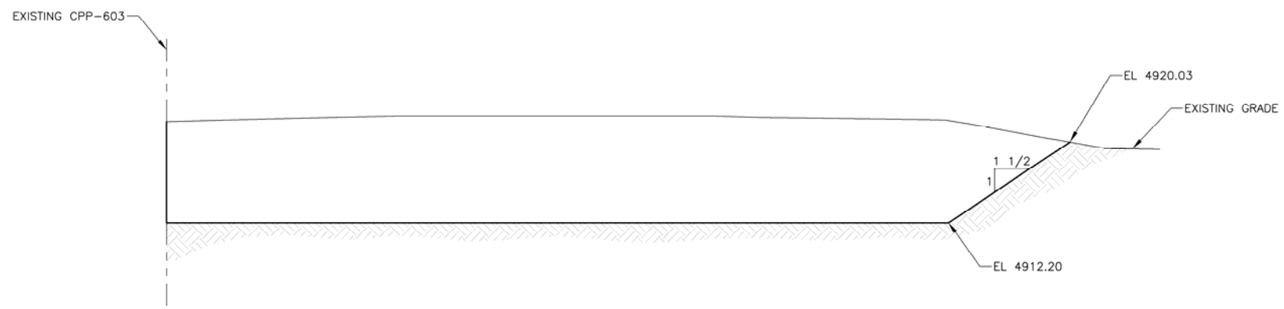
EXCAVATION PLAN FOR CPP-08, 09 AND 10

PROJECT NO.	23083
SPCL CODE:	N/A
EFFECTIVE DATE:	N/A

INDEX CODE NUMBER			
AREA	TYPE	FL	DRG
200	0100	02	136

SIZE D | DWG- N/A | REV

DAR NO. N/A | SHEET FIG-3



SECTION
SCALE: 1"=6.0'
C
FIG-3

SECTION
SCALE: 1"=6.0'
D
FIG-3

FIGURE-4

PRELIMINARY
NOT RELEASED - NOT APPROVED FOR CONSTRUCTION

REV	DATE	DESCRIPTION
REVISION HISTORY		

6" 4" 2" 0 6"
SCALE: 1" = 6.0'

DESIGN PHASE:	PRELIMINARY
SAFETY CATEGORY:	CG
HORIZONTAL SCALE	1"=6.0'
VERTICAL SCALE	N/A
FOR DRAWING INDEX SEE DRAWING NO.	N/A

INITIALS AND DATE FOR CURRENT RELEASE ONLY

	INITIALS	DATE:
DESIGN: K.D. FRITZ	N/A	N/A
DRAFTER:	N/A	N/A
DRAFTING CHECK: N/A	N/A	N/A
TECHNICAL CHECK: N/A	N/A	N/A
ENG GROUP SUPERVISOR: N/A	N/A	N/A
DESIGN PROJECT ENG: C.J. HURST	N/A	N/A

Idaho Cleanup Project
INTEC
CPP-08, 09 AND 10 SECTIONS

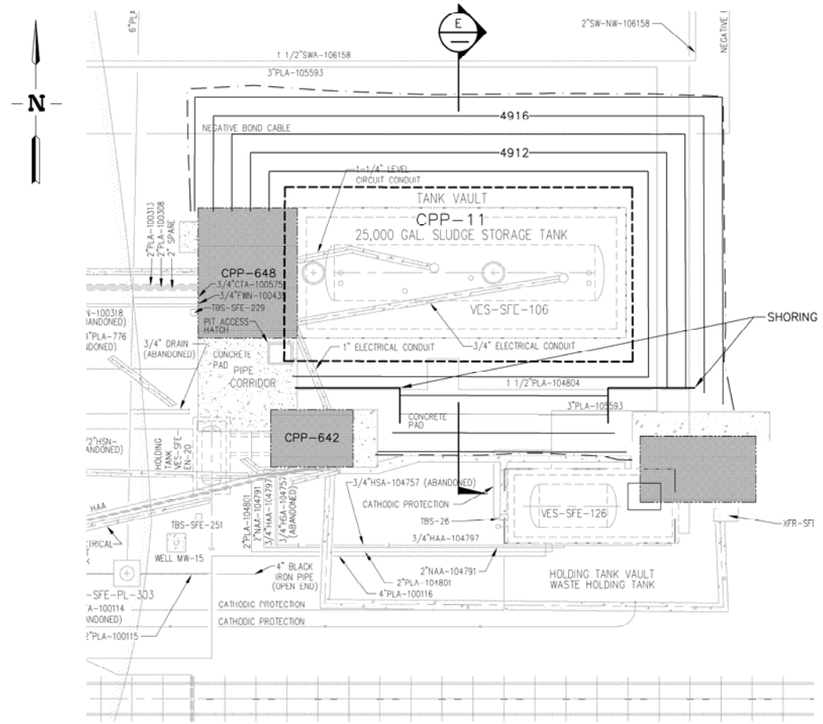
PROJECT NO.	23083
SPCL CODE:	N/A
EFFECTIVE DATE:	N/A

INDEX CODE NUMBER				
AREA	TYPE	FL	DRG	
200	0100	02	136	

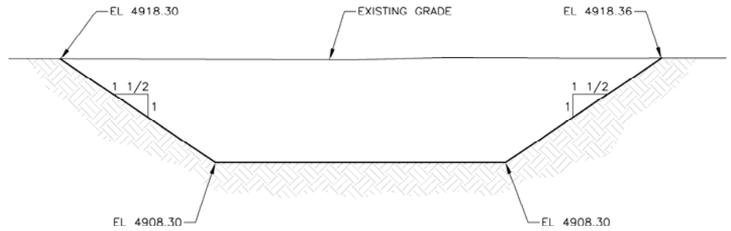
SIZE D | DWG- N/A | REV
DAR NO. N/A | SHEET FIG-4

FMT-DV-REV 2

File: Site_08-09-10.dwg Date: 01/05/06 - 2:09 PM Layout Name: Sections
Path: K:\INTEC WAG-3 Group 3 Other Soils Remedial Action\Controlled DWGS\2005-Fall ID: KJT



EXCAVATION PLAN FOR CPP-11
SCALE: 1"=10.0'



SECTION E
SCALE: 1"=6.0'

REV	DATE	DESCRIPTION

REVISION HISTORY

10' 5' 0 10'
SCALE: 1" = 10.0'
6' 4' 2' 0 6'
SCALE: 1" = 6.0'

DESIGN PHASE:	PRELIMINARY
SAFETY CATEGORY:	CG
HORIZONTAL SCALE	NOTED
VERTICAL SCALE	N/A
FOR DRAWING INDEX SEE DRAWING NO.	N/A

INITIALS AND DATE FOR CURRENT RELEASE ONLY

	INITIALS	DATE
DESIGN: K.D. FRITZ	N/A	N/A
DRAFTER:	N/A	N/A
DRAFTING CHECK: N/A	N/A	N/A
TECHNICAL CHECK: N/A	N/A	N/A
ENG GROUP SUPERVISOR: N/A	N/A	N/A
DESIGN PROJECT ENG: C.J. HURST	N/A	N/A

CH2MHILL

Idaho Cleanup Project

INTEC

EXCAVATION PLAN FOR CPP-11 AND SECTION

PROJECT NO.	23083
SPCL CODE:	N/A
EFFECTIVE DATE:	N/A

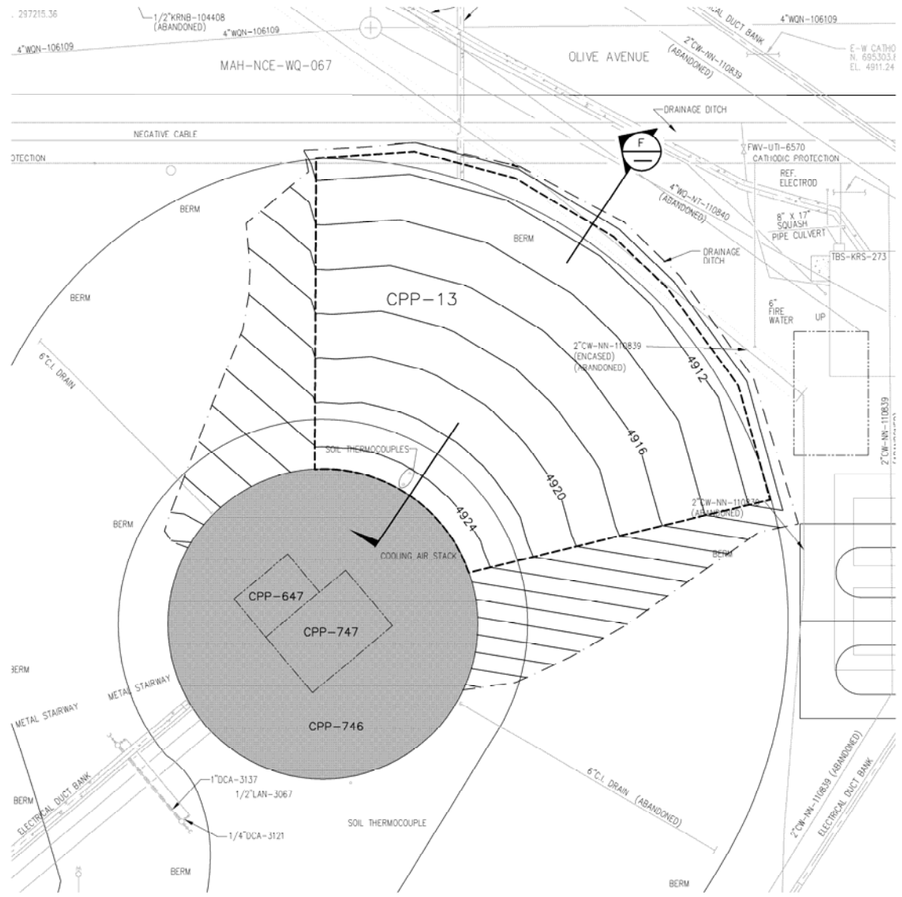
INDEX CODE NUMBER			
AREA	TYPE	CL	ORG
200	0100	02	136

SIZE D DWG- N/A REV

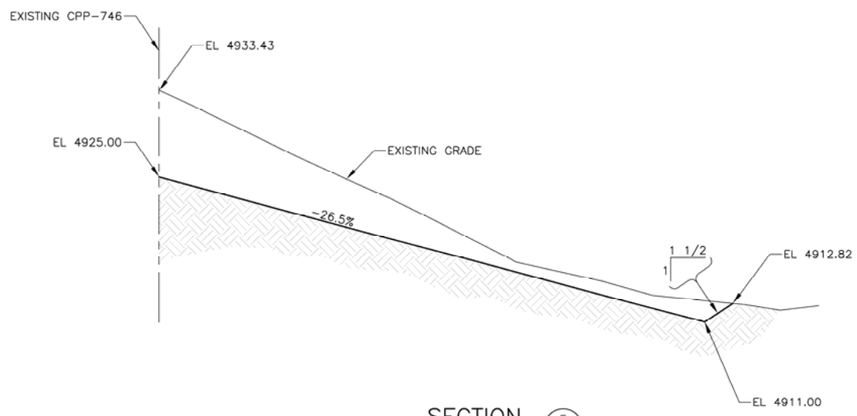
DAR NO. N/A SHEET FIG-5

FIGURE-5

PRELIMINARY
NOT RELEASED - NOT APPROVED FOR CONSTRUCTION



EXCAVATION PLAN FOR CPP-13
SCALE: 1"=10.0'



SECTION F
SCALE: 1"=6.0'

FIGURE-6

PRELIMINARY
NOT RELEASED - NOT APPROVED FOR CONSTRUCTION

REV	DATE	DESCRIPTION
REVISION HISTORY		

SCALE: 1" = 10.0'
SCALE: 1" = 6.0'

DESIGN PHASE:	PRELIMINARY
SAFETY CATEGORY:	CG
HORIZONTAL SCALE	NOTED
VERTICAL SCALE	N/A
FOR DRAWING INDEX SEE DRAWING NO.	N/A

INITIALS AND DATE FOR CURRENT RELEASE ONLY

	INITIALS	DATE:
DESIGN: K.D. FRITZ	N/A	N/A
DRAFTER: Lisa L. Keller	N/A	N/A
DRAFTING CHECK: N/A	N/A	N/A
TECHNICAL CHECK: N/A	N/A	N/A
ENG GROUP SUPERVISOR: N/A	N/A	N/A
DESIGN PROJECT ENG: C.J. HURST	N/A	N/A

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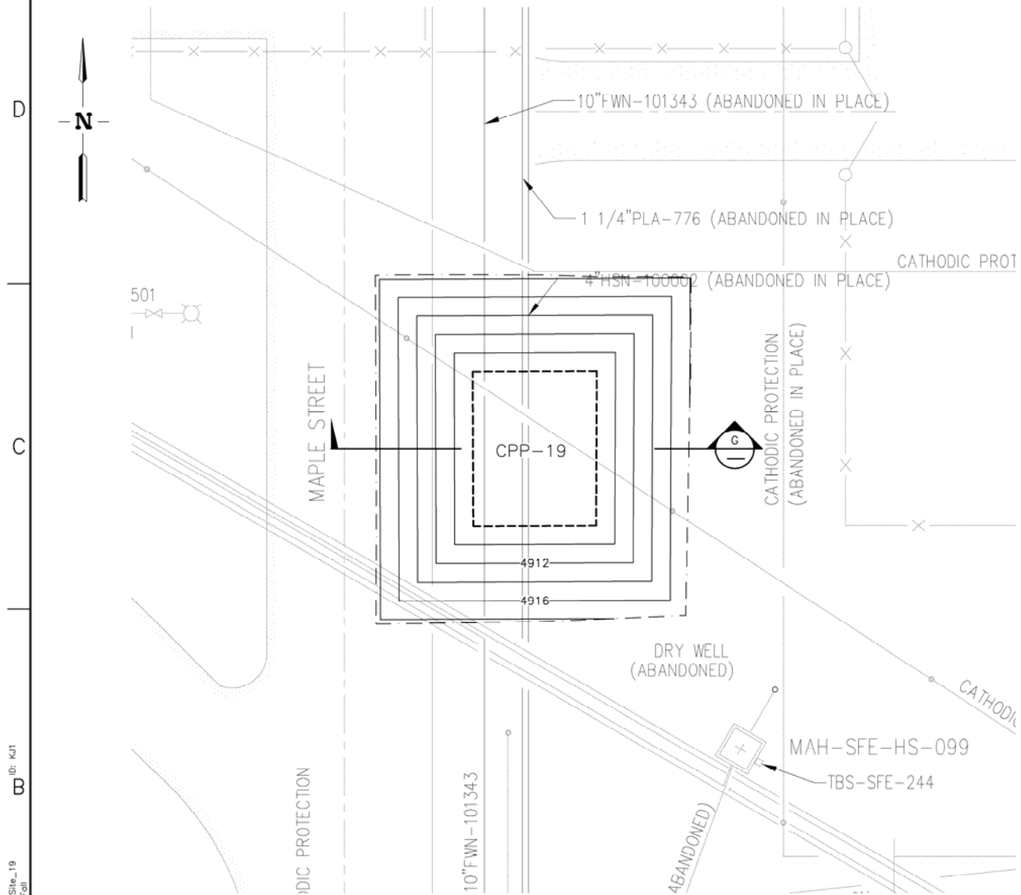
Idaho Cleanup Project
INTEC
EXCAVATION PLAN FOR CPP-13 AND SECTION

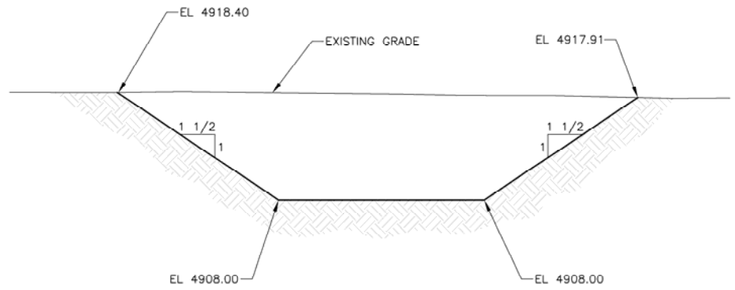
PROJECT NO.	23083
SPCL CODE:	N/A
EFFECTIVE DATE:	N/A

INDEX CODE NUMBER			
AREA	TYPE	CL	DRG
200	0100	02	136

SIZE D DWG- N/A REV
DAR NO. N/A SHEET FIG-6



EXCAVATION PLAN FOR CPP-19
SCALE: 1"=10.0'



SECTION
SCALE: 1"=6.0'

REV	DATE	DESCRIPTION
REVISION HISTORY		

10' 5' 0 10'
SCALE: 1" = 10.0'
6' 4' 2' 0 6'
SCALE: 1" = 6.0'

DESIGN PHASE:	PRELIMINARY
SAFETY CATEGORY:	CG
HORIZONTAL SCALE	NOTED
VERTICAL SCALE	N/A
FOR DRAWING INDEX SEE DRAWING NO.	N/A

INITIALS AND DATE FOR CURRENT RELEASE ONLY

	INITIALS	DATE
DESIGN: K.D. FRITZ	N/A	N/A
DRAFTER:	N/A	N/A
DRAFTING CHECK: N/A	N/A	N/A
TECHNICAL CHECK: N/A	N/A	N/A
ENG GROUP SUPERVISOR: N/A	N/A	N/A
DESIGN PROJECT ENG: C.J. HURST	N/A	N/A

CH2MHILL

Idaho Cleanup Project

INTEC

EXCAVATION PLAN FOR CPP-19 AND SECTION

PROJECT NO.	23083
SPCL CODE:	N/A
EFFECTIVE DATE:	N/A

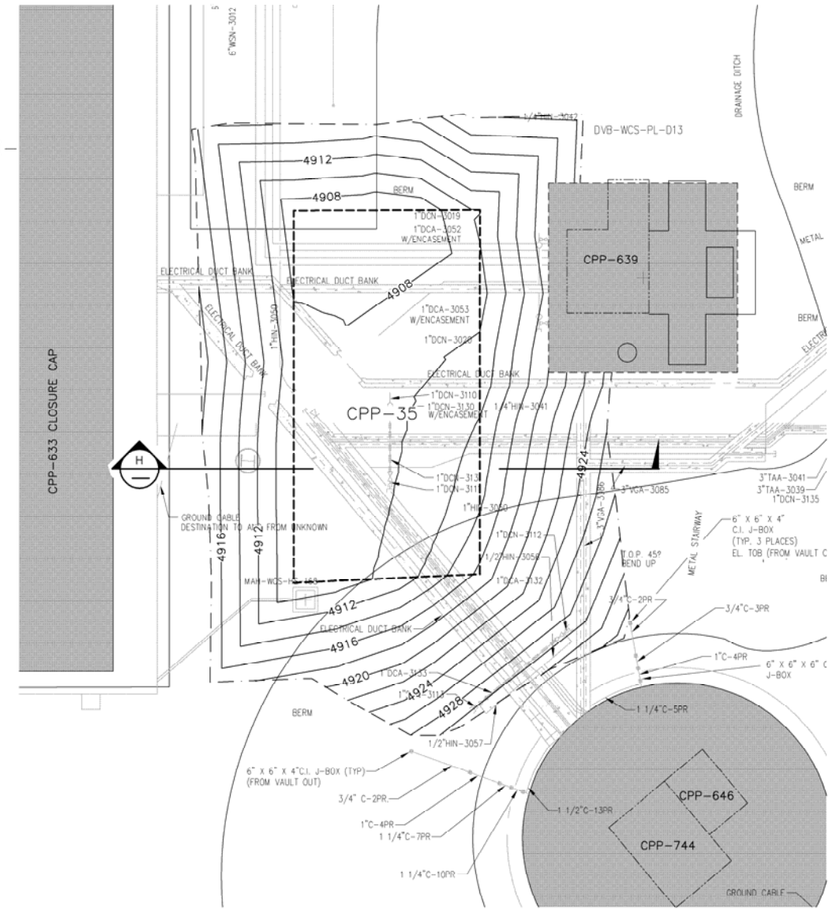
INDEX CODE NUMBER			
AREA	TYPE	CL	ORG
200	0100	02	136

SIZE D DWG- N/A REV

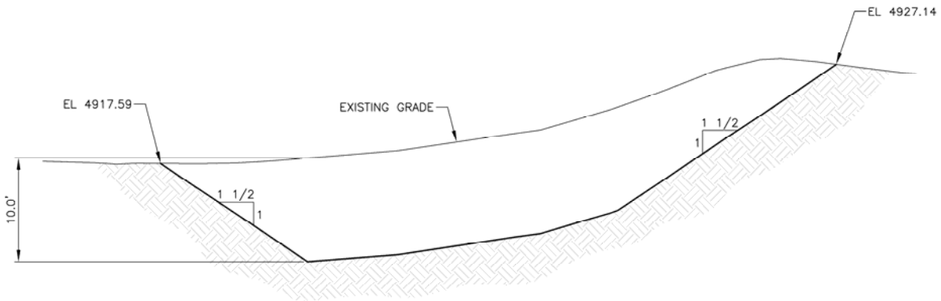
DAR NO. N/A SHEET FIG-7

FIGURE-7

PRELIMINARY
NOT RELEASED - NOT APPROVED FOR CONSTRUCTION



EXCAVATION PLAN FOR CPP-35
SCALE: 1"=10.0'



SECTION H
SCALE: 1"=6.0'

FIGURE-8

PRELIMINARY
NOT RELEASED - NOT APPROVED FOR CONSTRUCTION

REV	DATE	DESCRIPTION
REVISION HISTORY		

10' 5' 0 10'
SCALE: 1" = 10.0'
6' 4' 2' 0 6'
SCALE: 1" = 6.0'

DESIGN PHASE:	PRELIMINARY
SAFETY CATEGORY:	CG
HORIZONTAL SCALE	NOTED
VERTICAL SCALE	N/A
FOR DRAWING INDEX SEE DRAWING NO.	N/A

INITIALS AND DATE FOR CURRENT RELEASE ONLY

	INITIALS	DATE
DESIGN: K.D. FRITZ	N/A	N/A
DRAFTER:	N/A	N/A
DRAFTING CHECK: N/A	N/A	N/A
TECHNICAL CHECK: N/A	N/A	N/A
ENG GROUP SUPERVISOR: N/A	N/A	N/A
DESIGN PROJECT ENG: C.J. HURST	N/A	N/A

CHEM-NUCLEAR SYSTEMS, LLC

Idaho Cleanup Project

INTEC

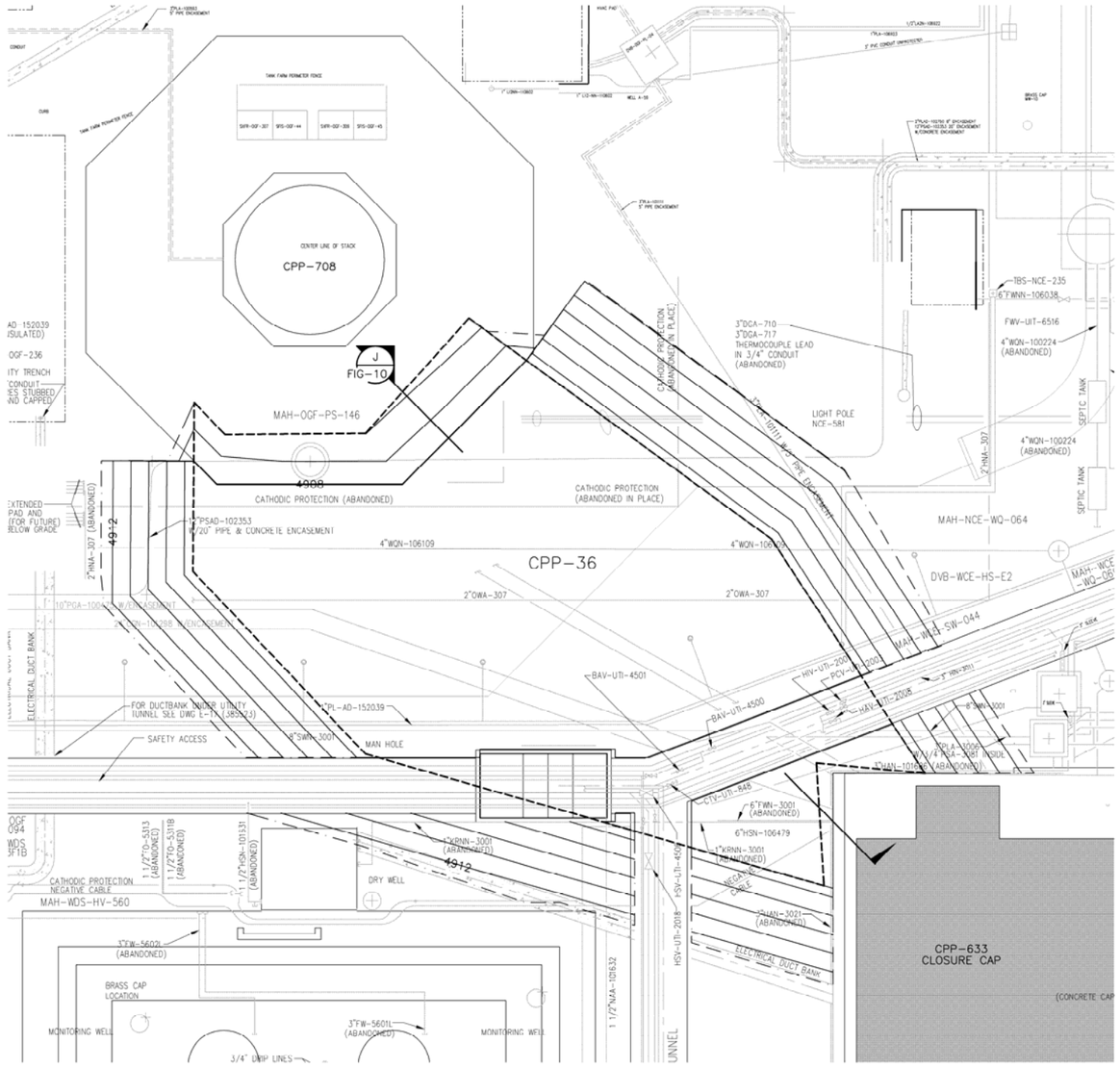
EXCAVATION PLAN FOR CPP-35 AND SECTION

PROJECT NO.	23083
SPCL CODE:	N/A
EFFECTIVE DATE:	N/A

INDEX CODE NUMBER			
AREA	TYPE	CL	ORG
200	0100	02	136

SIZE D DWG- N/A REV

DAR NO. N/A SHEET FIG-8



EXCAVATION PLAN FOR CPP-36
SCALE: 1"=10.0'

FIGURE-9

PRELIMINARY
NOT RELEASED - NOT APPROVED FOR CONSTRUCTION

REV	DATE	DESCRIPTION
REVISION HISTORY		

10' 5' 0 10'
SCALE: 1" = 10.0'

DESIGN PHASE:	PRELIMINARY
SAFETY CATEGORY:	CG
HORIZONTAL SCALE	1"=10.0'
VERTICAL SCALE	N/A
FOR DRAWING INDEX SEE DRAWING NO.	N/A

INITIALS AND DATE FOR CURRENT RELEASE ONLY

	INITIALS	DATE
DESIGN: K.D. FRITZ	N/A	N/A
DRAFTER:	N/A	N/A
DRAFTING CHECK: N/A	N/A	N/A
TECHNICAL CHECK: N/A	N/A	N/A
ENG GROUP SUPERVISOR: N/A	N/A	N/A
DESIGN PROJECT ENG: C.J. HURST	N/A	N/A

CHEMWOG

Idaho Cleanup Project

INTEC

EXCAVATION PLAN FOR CPP-36

PROJECT NO.	23083
SPCL CODE:	N/A
EFFECTIVE DATE:	N/A

INDEX CODE NUMBER			
ABCA	TYPE	CL	ORIG
200	0100	02	136

SIZE D DWG- N/A REV

DAR NO. N/A SHEET FIG-9

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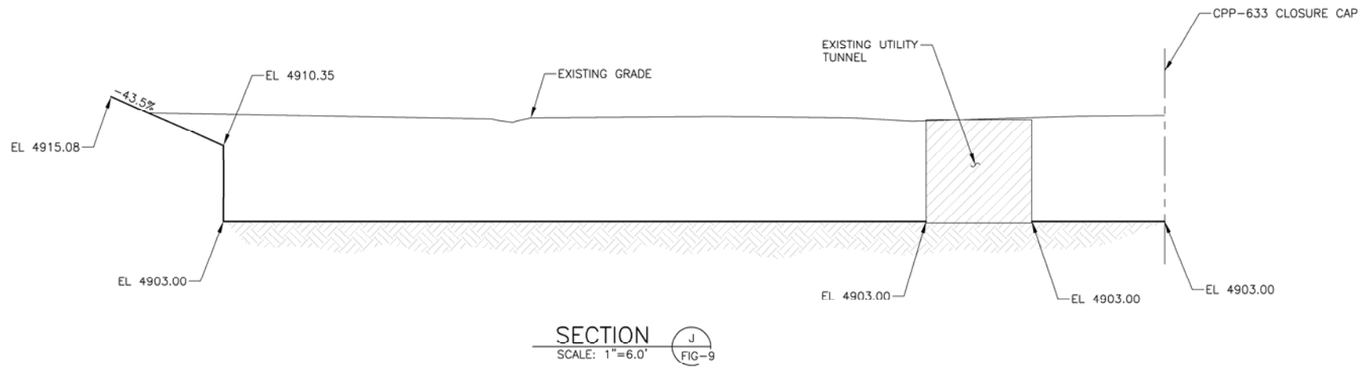
Date: 01/05/06 - 2:08 PM | Layout Name: Site_36
ID: KJ1



SECTION (J / FIG-9)
SCALE: 1"=6.0'

FIGURE-10

REV	DATE	DESCRIPTION

REVISION HISTORY

SCALE: 1" = 6.0'

DESIGN PHASE:	PRELIMINARY
SAFETY CATEGORY:	CG
HORIZONTAL SCALE	1"=6.0'
VERTICAL SCALE	N/A
FOR DRAWING INDEX SEE DRAWING NO.	N/A

INITIALS AND DATE FOR CURRENT RELEASE ONLY

	INITIALS	DATE
DESIGN: K.D. FRITZ	N/A	N/A
DRAFTER:	N/A	N/A
DRAFTING CHECK: N/A	N/A	N/A
TECHNICAL CHECK: N/A	N/A	N/A
ENG GROUP SUPERVISOR: N/A	N/A	N/A
DESIGN PROJECT ENG: C.J. HURST	N/A	N/A

CH2M HILL

Idaho Cleanup Project

INTEC

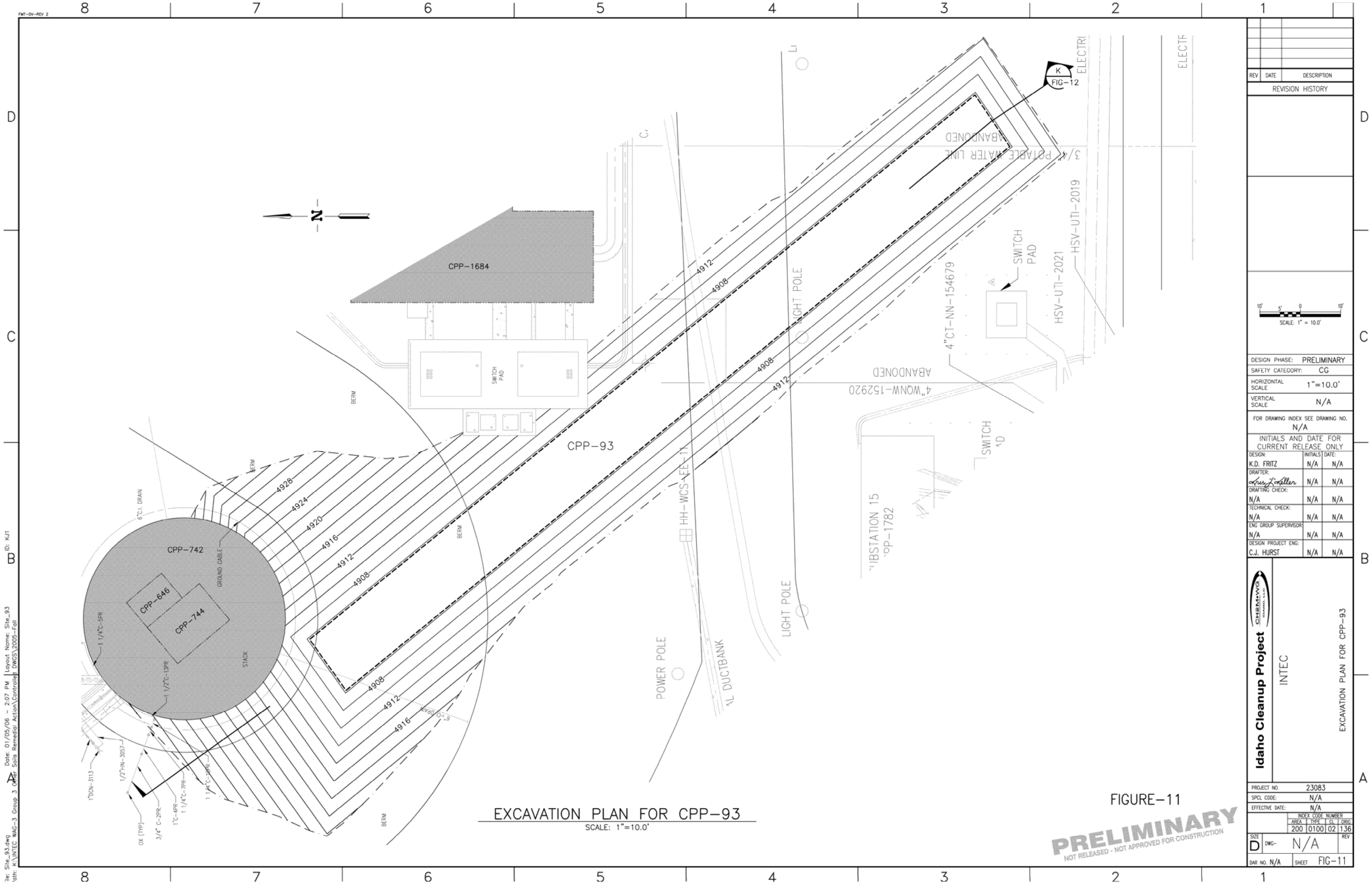
CPP-36 SECTION

PROJECT NO.	23083
SPCL CODE:	N/A
EFFECTIVE DATE:	N/A

INDEX CODE NUMBER			
AREA	TYPE	FL	DRG
200	0100	02	136

SIZE D | DWG- N/A | REV

DAR NO. N/A | SHEET FIG-10


EXCAVATION PLAN FOR CPP-93
SCALE: 1"=10.0'
FIGURE-11
CPP-93
CPP-1684
CPP-742
CPP-646
CPP-744
SWITCH PAD
STACK
GROUND CABLE
BERM
6"C.I. DRAIN
4928
4924
4920
4916
4912
4908
K
FIG-12
3/4" POTABLE WATER LINE ABANDONED
4"WONW-152920 ABANDONED
4"CT-NN-154679
HSV-UTI-2019
HSV-UTI-2021
LIGHT POLE
POWER POLE
HH-WCS-EE-11
1 1/4"C-5PR
1 1/2"C-13PR
1"DCN-3113
1/2"HIN-3057
OX (TYP)
3/4" C-2PR
1"C-4PR
1 1/4"C-7PR
1 1/4"C-10PR
PRELIMINARY
NOT RELEASED - NOT APPROVED FOR CONSTRUCTION
REV
DATE
DESCRIPTION
REVISION HISTORY
SCALE: 1" = 10.0'
DESIGN PHASE: PRELIMINARY
SAFETY CATEGORY: CG
HORIZONTAL SCALE 1"=10.0'
VERTICAL SCALE N/A
FOR DRAWING INDEX SEE DRAWING NO. N/A
INITIALS AND DATE FOR CURRENT RELEASE ONLY
DESIGN: K.D. FRITZ N/A N/A
DRAFTER: N/A N/A
DRAFTING CHECK: N/A N/A N/A
TECHNICAL CHECK: N/A N/A N/A
ENG GROUP SUPERVISOR: N/A N/A N/A
DESIGN PROJECT ENG: C.J. HURST N/A N/A
Idaho Cleanup Project
INTEC
EXCAVATION PLAN FOR CPP-93
PROJECT NO. 23083
SPCL CODE: N/A
EFFECTIVE DATE: N/A
INDEX CODE NUMBER AREA 200 TYPE 0100 CL 02 ORIG 136
SIZE D DWG- N/A REV
DAR NO. N/A SHEET FIG-11
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Date: 01/05/06 - 2:07 PM
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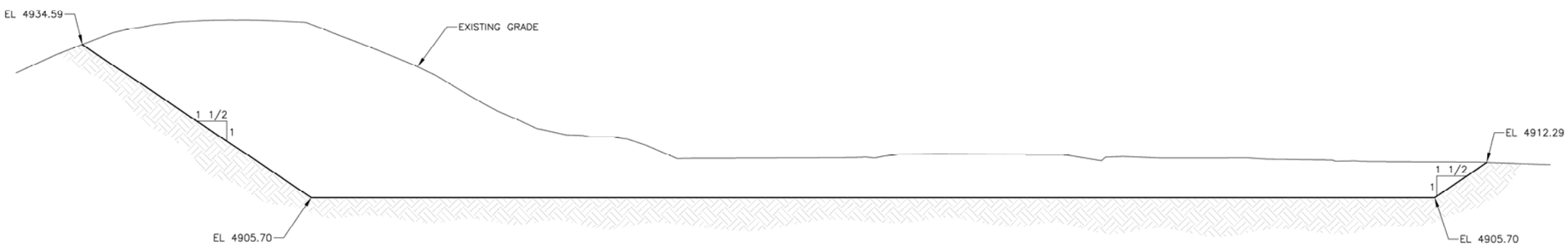
ID: KJ1



SECTION (K / FIG-11)
SCALE: 1"=10.0'

REV	DATE	DESCRIPTION
REVISION HISTORY		

10' 5' 0 10'
SCALE: 1" = 10.0'

DESIGN PHASE:	PRELIMINARY
SAFETY CATEGORY:	CG
HORIZONTAL SCALE	1"=10.0'
VERTICAL SCALE	N/A
FOR DRAWING INDEX SEE DRAWING NO.	N/A

INITIALS AND DATE FOR CURRENT RELEASE ONLY

	INITIALS	DATE
DESIGN: K.D. FRITZ	N/A	N/A
DRAFTER: chris kinsella	N/A	N/A
DRAFTING CHECK: N/A	N/A	N/A
TECHNICAL CHECK: N/A	N/A	N/A
ENG GROUP SUPERVISOR: N/A	N/A	N/A
DESIGN PROJECT ENG: C.J. HURST	N/A	N/A

CH2M HILL

Idaho Cleanup Project

INTEC

CPP-93 SECTION

PROJECT NO.	23083
SPCL CODE:	N/A
EFFECTIVE DATE:	N/A

INDEX CODE NUMBER				
AREA	TYPE	FI	DISC	
200	0100	02	136	

SIZE D | DWG- N/A | REV

DAR NO. N/A | SHEET FIG-12

FIGURE-12

ID: KJ1
Date: 01/05/06 - 2:07 PM | Layout Name: Sections
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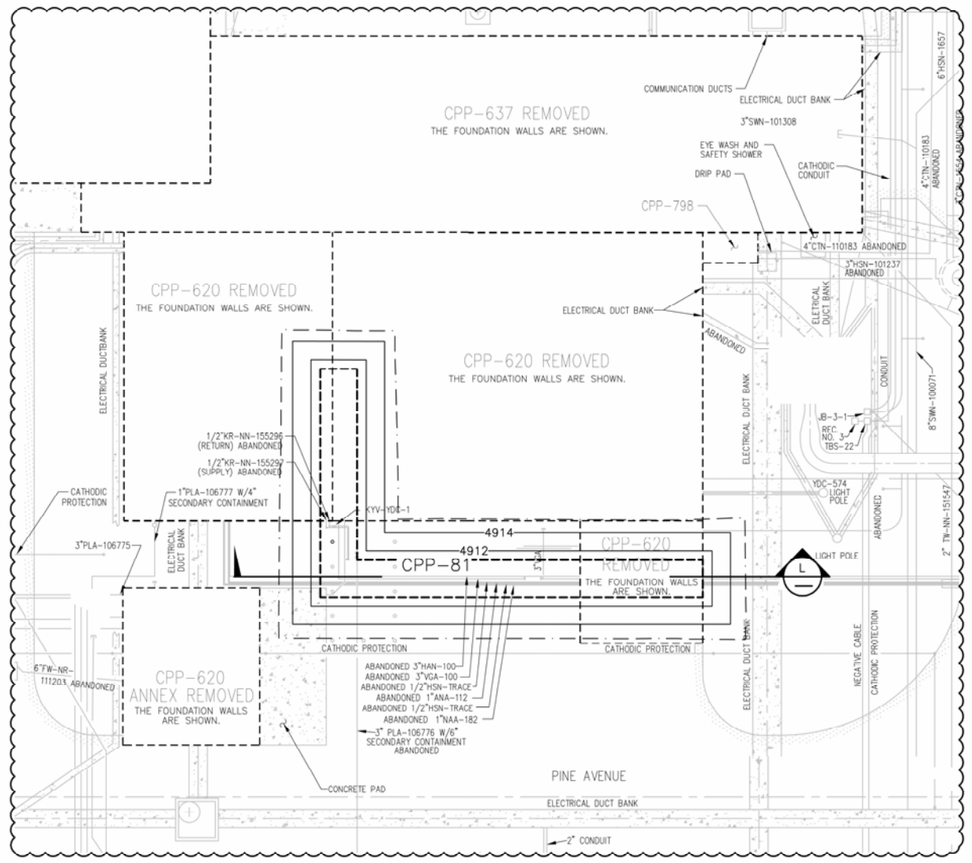
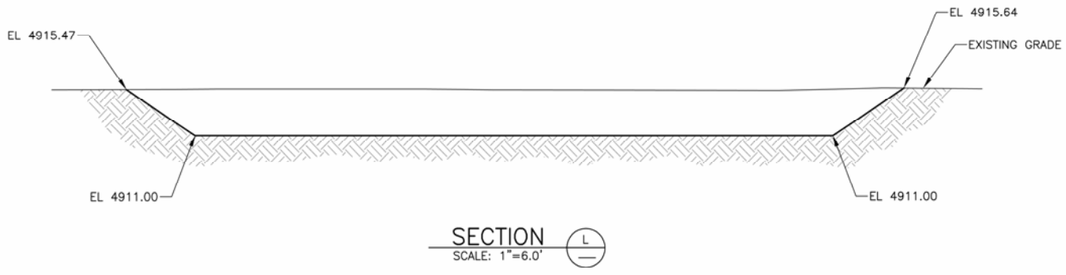
Path: K:\INTEC WAG-3 Group 3 Other Soils Remedial Action\Controlled DWGS\2005-Fall



EXCAVATION PLAN FOR CPP-81
SCALE: 1"=10.0'



SECTION L
SCALE: 1"=6.0'

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

REV	DATE	DESCRIPTION

REVISION HISTORY

SCALE: 1" = 10.0'

SCALE: 1" = 6.0'

DESIGN PHASE:	PRELIMINARY
SAFETY CATEGORY:	CG
HORIZONTAL SCALE	NOTED
VERTICAL SCALE	N/A
FOR DRAWING INDEX SEE DRAWING NO.	N/A

INITIALS AND DATE FOR CURRENT RELEASE ONLY

	INITIALS	DATE
DESIGN: K.D. FRITZ	N/A	N/A
DRAFTER:	N/A	N/A
DRAFTING CHECK: N/A	N/A	N/A
TECHNICAL CHECK: N/A	N/A	N/A
ENG GROUP SUPERVISOR: N/A	N/A	N/A
DESIGN PROJECT ENG: C.J. HURST	N/A	N/A

Idaho Cleanup Project

INTEC

FIGURE B-13

EXCAVATION PLAN FOR CPP-81 AND SECTION

PROJECT NO.	23083
SPCL CODE:	N/A
EFFECTIVE DATE:	N/A

INDEX CODE NUMBER			
AREA	TYPE	CL	ORG
200	0100	02	136

SIZE D DWG- N/A REV

DRF NO. N/A SHEET FIG B-13

File: Fig-13_Ste_81.dwg
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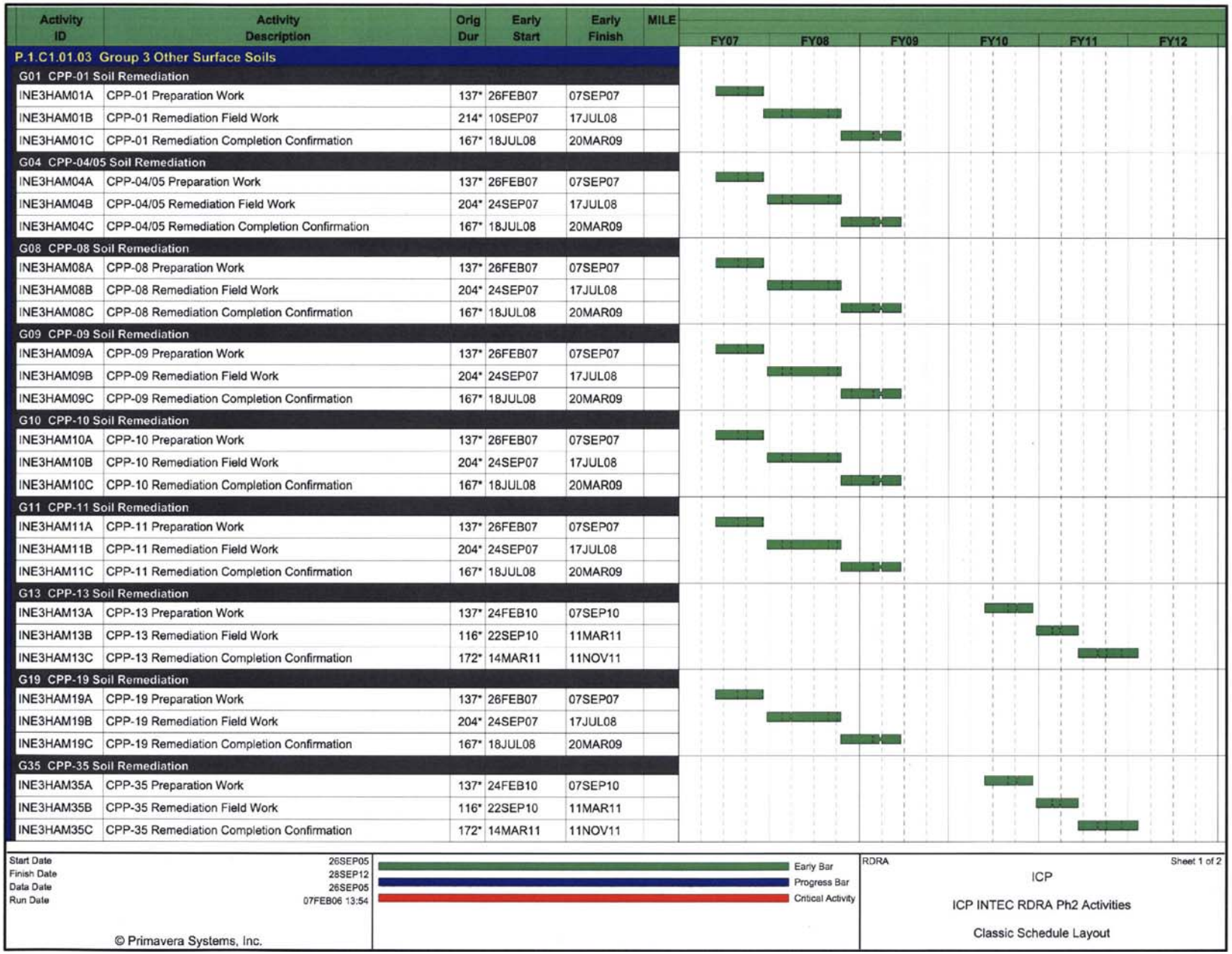
Date: 04/12/06 - 7:59 AM | Layout Name: Site_81
ID: K.I

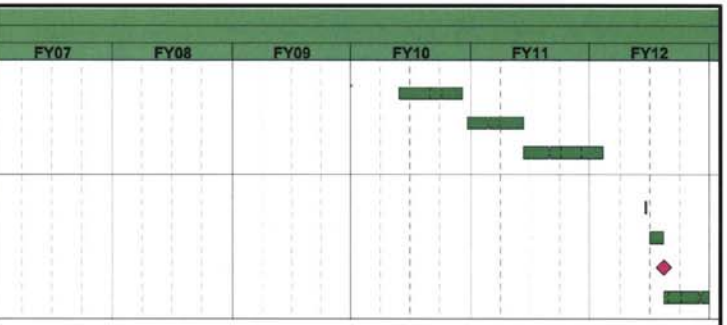
Appendix C

Project Schedule



Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	MILE
P.1.C1.01.03 Group 3 Other Surface Soils					
G01 CPP-01 Soil Remediation					
INE3HAM01A	CPP-01 Preparation Work	137*	26FEB07	07SEP07	
INE3HAM01B	CPP-01 Remediation Field Work	214*	10SEP07	17JUL08	
INE3HAM01C	CPP-01 Remediation Completion Confirmation	167*	18JUL08	20MAR09	
G04 CPP-04/05 Soil Remediation					
INE3HAM04A	CPP-04/05 Preparation Work	137*	26FEB07	07SEP07	
INE3HAM04B	CPP-04/05 Remediation Field Work	204*	24SEP07	17JUL08	
INE3HAM04C	CPP-04/05 Remediation Completion Confirmation	167*	18JUL08	20MAR09	
G08 CPP-08 Soil Remediation					
INE3HAM08A	CPP-08 Preparation Work	137*	26FEB07	07SEP07	
INE3HAM08B	CPP-08 Remediation Field Work	204*	24SEP07	17JUL08	
INE3HAM08C	CPP-08 Remediation Completion Confirmation	167*	18JUL08	20MAR09	
G09 CPP-09 Soil Remediation					
INE3HAM09A	CPP-09 Preparation Work	137*	26FEB07	07SEP07	
INE3HAM09B	CPP-09 Remediation Field Work	204*	24SEP07	17JUL08	
INE3HAM09C	CPP-09 Remediation Completion Confirmation	167*	18JUL08	20MAR09	
G10 CPP-10 Soil Remediation					
INE3HAM10A	CPP-10 Preparation Work	137*	26FEB07	07SEP07	
INE3HAM10B	CPP-10 Remediation Field Work	204*	24SEP07	17JUL08	
INE3HAM10C	CPP-10 Remediation Completion Confirmation	167*	18JUL08	20MAR09	
G11 CPP-11 Soil Remediation					
INE3HAM11A	CPP-11 Preparation Work	137*	26FEB07	07SEP07	
INE3HAM11B	CPP-11 Remediation Field Work	204*	24SEP07	17JUL08	
INE3HAM11C	CPP-11 Remediation Completion Confirmation	167*	18JUL08	20MAR09	
G13 CPP-13 Soil Remediation					
INE3HAM13A	CPP-13 Preparation Work	137*	24FEB10	07SEP10	
INE3HAM13B	CPP-13 Remediation Field Work	116*	22SEP10	11MAR11	
INE3HAM13C	CPP-13 Remediation Completion Confirmation	172*	14MAR11	11NOV11	
G19 CPP-19 Soil Remediation					
INE3HAM19A	CPP-19 Preparation Work	137*	26FEB07	07SEP07	
INE3HAM19B	CPP-19 Remediation Field Work	204*	24SEP07	17JUL08	
INE3HAM19C	CPP-19 Remediation Completion Confirmation	167*	18JUL08	20MAR09	
G35 CPP-35 Soil Remediation					
INE3HAM35A	CPP-35 Preparation Work	137*	24FEB10	07SEP10	
INE3HAM35B	CPP-35 Remediation Field Work	116*	22SEP10	11MAR11	
INE3HAM35C	CPP-35 Remediation Completion Confirmation	172*	14MAR11	11NOV11	

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	MILE
G36 CPP-36/91 Soil Remediation					
INE3HAM36A	CPP-36/91 Preparation Work	137*	24FEB10	07SEP10	
INE3HAM36B	CPP-36/91 Remediation Field Work	116*	22SEP10	11MAR11	
INE3HAM36C	CPP-36/91 Remediation Completion Confirmation	172*	14MAR11	11NOV11	
GRA Group 3 Phase 2 RA					
INE3EM10	G3 Phase 2 Final Inspection	4	19MAR12*	22MAR12	
INE3EM20	Prepare Draft G3 Phase 2 RA Report	30	02APR12	11MAY12	
INE3EM30	Submit OU 3-13 Dft Gp 3 Ph 2 RA Rpt to Agencies	0		11MAY12	E1A
INE3HANRAA	OU 3-13 Ph2 RA Report Review & Appr Cycle	97*	14MAY12	28SEP12	



Start Date 26SEP05
Finish Date 28SEP12
Data Date 26SEP05
Run Date 07FEB06 13:54

Early Bar
Progress Bar
Critical Activity

RDRA Sheet 2 of 2

ICP

ICP INTEC RDRA Ph2 Activities

Classic Schedule Layout

Appendix D

OU 3-13 Project Cost Estimate

Appendix D

OU 3-13 Project Cost Estimate

Group 3, Phase II, Other Surface Soils - Cost Estimate.

Site	Description	Total Amount
	Group 3 Phase II RD/RA WP	$846,205
CPP-01	Concrete Settling Basin and Dry Wells	$524,494
CPP-04/05	Contaminated Soil Area Around CPP-603 Settling Tank and Basin	$651,717
CPP-08	Basin Filter System Line Failure	$731,227
CPP-09	Contamination at Northeast Corner of CPP-603 South Basin	$729,641
CPP-10	CPP-603 plastic line leak	$340,656
CPP-11	CPP-603 sludge and water release	$496,526
CPP-13	Pressurization of solid storage cyclone release northeast of CPP-633	$912,896
CPP-19	CPP-603 to CPP-604 line leak.	$855,465
CPP-35	CPP-633 decontamination spill	$345,072
CPP-36	Transfer line leak from CPP-633	$1,257,515
CPP-93	Simulated calcine disposal trench.	$705,490
CPP-124	Leak east of CPP-601	TBD
	Group 3 Phase II Remedial Action Report	$103,993
	TOTAL	$8,500,898

Appendix E

Pre-final Inspection Checklist

Appendix E

Pre-final Inspection Checklist

Soil Contamination Sites Inspected:				
Inspection Items		**Incomplete**	**Complete**	
Item	**RD/RA Section**			**Comments/Corrective Actions**
Remedial action approach has been implemented for each soil contamination site.	1.3			
Strategy for managing unexpected soil contamination has been implemented for each site.	1.3.2, 2.5			
Identified unresolved issues have been managed.	2.6			
Confirmation sampling/screening has been completed to demonstrate that the remediation goals have been met.	3.2.2.3			
Verify that the Phase II excavations have been backfilled and graded consistent with the remedial design.	3.2.2.5			
Verify that the Phase II utility modifications have been performed.	3.2.2.4			
Compare actual utility lines capped or demolished versus those anticipated in the original job scope.	3.2.2.4			
Review any change in scope orders to determine if there are significant impacts to the Work Plan.	4.0			

Soil Contamination Sites Inspected:

Inspection Items		Incomplete	Complete	
Item	**RD/RA Section**			**Comments/Corrective Actions**
Verify status of any accumulated waste generated during the Phase II work: - Is this waste being properly managed? - Are all waste tracking records available?	WMP			

Additional Comments:

Concurrence	**Date**
U.S. EPA:	
IDEQ:	
DOE-ID:	

Appendix F

OU 3-13 Phase II New Site Work Plans

Appendix F

OU 3-13 Phase II New Site Work Plans

Attachment 1

Operable Unit 3-13, Group 3, Other Surface Soils Remediation Set 4-6 (Phase II) Field Sampling Plan, DOE/ID-11256

Attachment 2

Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 4-6 (Phase II) Waste Management Plan, DOE/ID-11258