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Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 1-3 (Phase I) Remedial Design/Remedial Action Work Plan

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Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 1-3 (Phase I) Remedial Design/Remedial Action Work Plan

February 2004

Prepared for the
U.S. Department of Energy
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 1-3 (Phase I) located at the Idaho Nuclear Technology and Engineering Center at the Idaho National Engineering and Environmental 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 remediated, as described in this Work Plan, include Set 1 sites: CPP-92, -97, -98, and -99; Set 2 sites: CPP-37B and 37-C; and Set 3 sites: CPP-03, -34A/B, -37A, and -67. 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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ACRONYMS

ARAR	applicable or relevant and appropriate requirement
BBWI	Bechtel BWXT Idaho, LLC
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	*Code of Federal Regulations*
COC	contaminant of concern
cpm	count per minute
CPP	Chemical Processing Plant
DOE	Department of Energy
ECA	Environmentally Controlled Area
EDF	Engineering Design File
EPA	Environmental Protection Agency
FFA/CO	Federal Facility Agreement and Consent Order
FR	*Federal Register*
FSP	field sampling plan
GPR	ground-penetrating radar
HASP	health and safety plan
HI	hazard index
HLW	high-level waste
HWMA	Hazardous Waste Management Act
ICDF	INEEL CERCLA Disposal Facility
ICPP	Idaho Chemical Processing Plant
IDAPA	Idaho Administrative Procedures Act
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center

IWTS	Integrated Waste Tracking System
LDR	land disposal restriction
MCP	management control procedure
NE-ID	Department of Energy Idaho Operations Office
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NWPA	Nuclear Waste Policy Act
OU	operable unit
PCB	polychlorinated biphenyl
PEW	process equipment waste
PM	project manager
PRD	program requirements document
QA	quality assurance
QC	quality control
RA	remedial action
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RD/RA	remedial design/remedial action
RFP	Request for Proposal
RG	remediation goal
ROD	Record of Decision
RWMC	Radioactive Waste Management Complex
SNF	spent nuclear fuel
SOW	Scope of Work
SRPA	Snake River Plain Aquifer
SSA	Staging and Storage Annex

SSSTF	Staging, Storage, Sizing, and Treatment Facility
SVOC	semivolatile organic compound
SWP	service waste pump
VOC	volatile organic compound
WAC	Waste Acceptance Criteria
WAG	waste area group
WCF	Waste Calcining Facility
WGS	Waste Generator Services
WINCO	Westinghouse Idaho Nuclear Company
WIR	waste incidental to reprocessing
WMP	waste management plan

Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 1-3 (Phase I) 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 Engineering and Environmental Laboratory (INEEL) in accordance with the INEEL Federal Facility Agreement and Consent Order (FFA/CO) (DOE-ID 1991). 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 1-3 (Phase I) sites. These CERCLA remedial actions (RAs) will proceed in accordance with the signed Record of Decision (ROD) for OU 3-13 (DOE-ID 1999).

1.1 Background

The INEEL encompasses 2,305 km^2 (890 mi^2) and is located approximately 55 km (34 mi) west of Idaho Falls, Idaho (Figure 1-1). The United States Atomic Energy Commission, now the U.S. Department of Energy (DOE), established the Nuclear Reactor Testing Station, now the INEEL, in 1949 as a site for building and testing nuclear facilities. At present, the INEEL supports the engineering and operations efforts of DOE and other federal agencies in areas of nuclear safety research, reactor development, reactor operations and training, nuclear defense materials production, waste management and technology development, and energy technology and conservation programs.

The INTEC is located in the south central portion of the INEEL approximately 13 km (8 mi) north of the southern INEEL boundary and covers an area of 0.4 km^2 (0.15 mi^2). Operations commenced at INTEC in 1953. The INTEC Facility has historically been a uranium reprocessing facility for both defense projects and research while also acting as a storage facility for spent nuclear fuel (SNF). While reprocessing activities at INTEC were phased out in the 1990s, the facility continues to receive and store SNF and radioactive wastes for future disposition.

In 1989, the U.S. Environmental Protection Agency (EPA) proposed listing the INEEL on the National Priorities List of the National Oil and Hazardous Substances Pollution Contingency Plan. The EPA issued a final ruling that listed the INEEL as a National Priorities List site in November 1989. As a result, the INEEL became subject to the requirements of CERCLA. The FFA/CO and associated action plan were developed to establish the procedural framework and schedule for developing, prioritizing, implementing, and monitoring response actions at the INEEL in accordance with CERCLA, the Resource Conservation and Recovery Act (RCRA), and the Idaho Hazardous Waste Management Act (HWMA).

Under the FFA/CO, the INEEL was divided into 10 WAGs. The INTEC 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 as requiring RA to mitigate risks to human health and the environment under a future

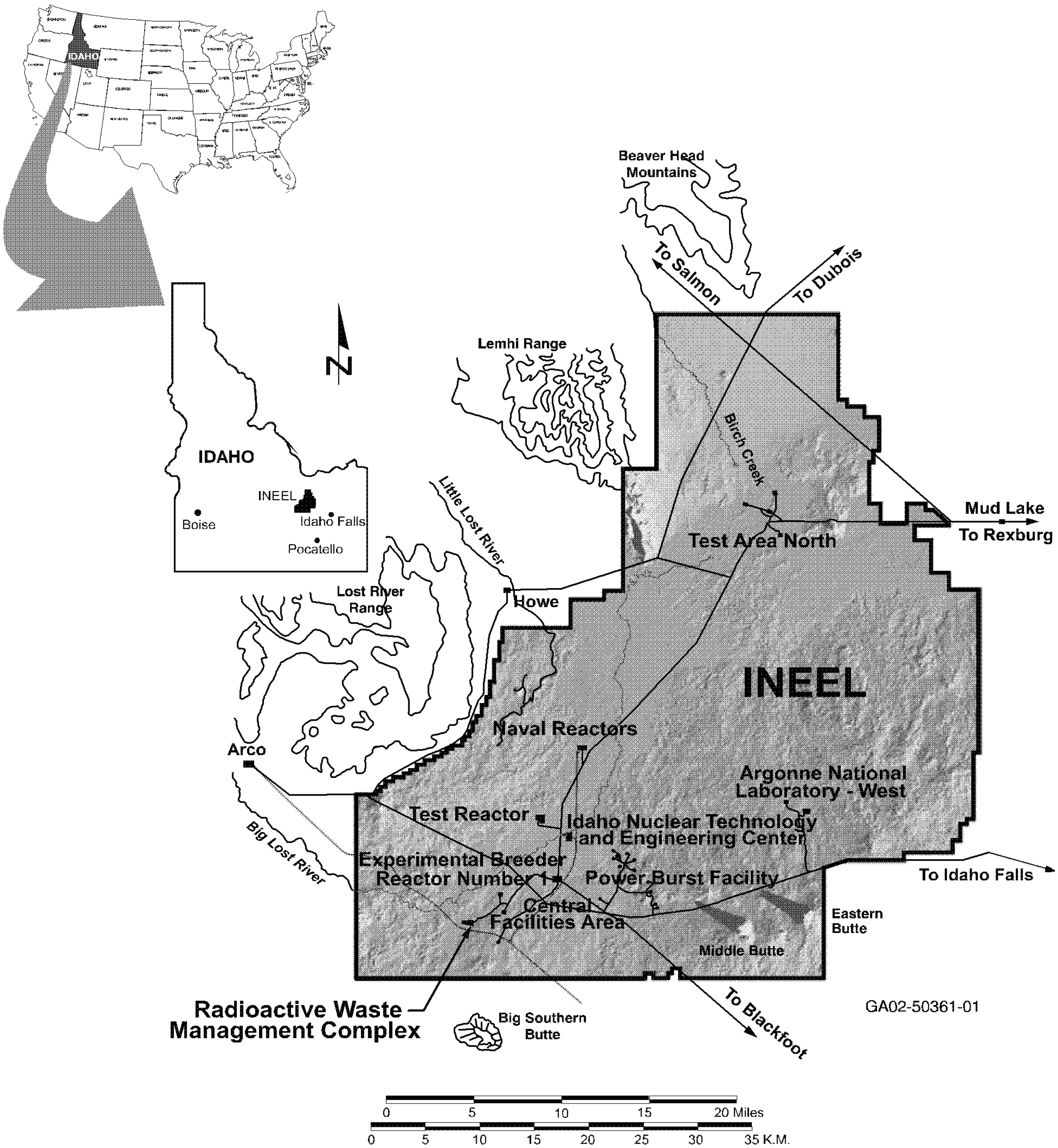

Figure 1-1. Location of the Idaho National Engineering and Environmental Laboratory.

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: SFE-20 Hot Waste Tank System.

The remediation of the Group 3, Other Surface Soils, Remediation Sets 1-3 sites is the scope of this RD/RA Work Plan.

1.2 Remedial Action Approach

The Group 3, Other Surface Soils sites consist of 29 of the 55 OU 3-13 release sites that required RA. 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 INEEL CERCLA Disposal Facility (ICDF). Using the criteria developed in the report, the sites were grouped into the following six sets identified in order of decreasing priority:

1. Sites with planned use potential within 10 years
2. Sites with planned use potential beyond 10 years
3. Easily accessible sites with moderate environmental risk reduction
4. Sites east of Chemical Processing Plant (CPP) -603 with significant environmental risk reduction
5. Sites in the Waste Calcining Facility (WCF) area with high environmental risk reduction, but significant INTEC coordination issues
6. Sites with no planned use and minimal environmental risk reduction.

The characterization and remediation of Sets 1, 2, and 3 are to be completed as Phase I of the OU 3-13, Group 3, Other Surface Soils, remediation project and are the scope of this RD/RA Work Plan. Remediation of Phase II Sets 4, 5, and 6 will be addressed separately at a later time. Remediation Sets 1-3 consist of the following sites, as shown in Figure 1-2:

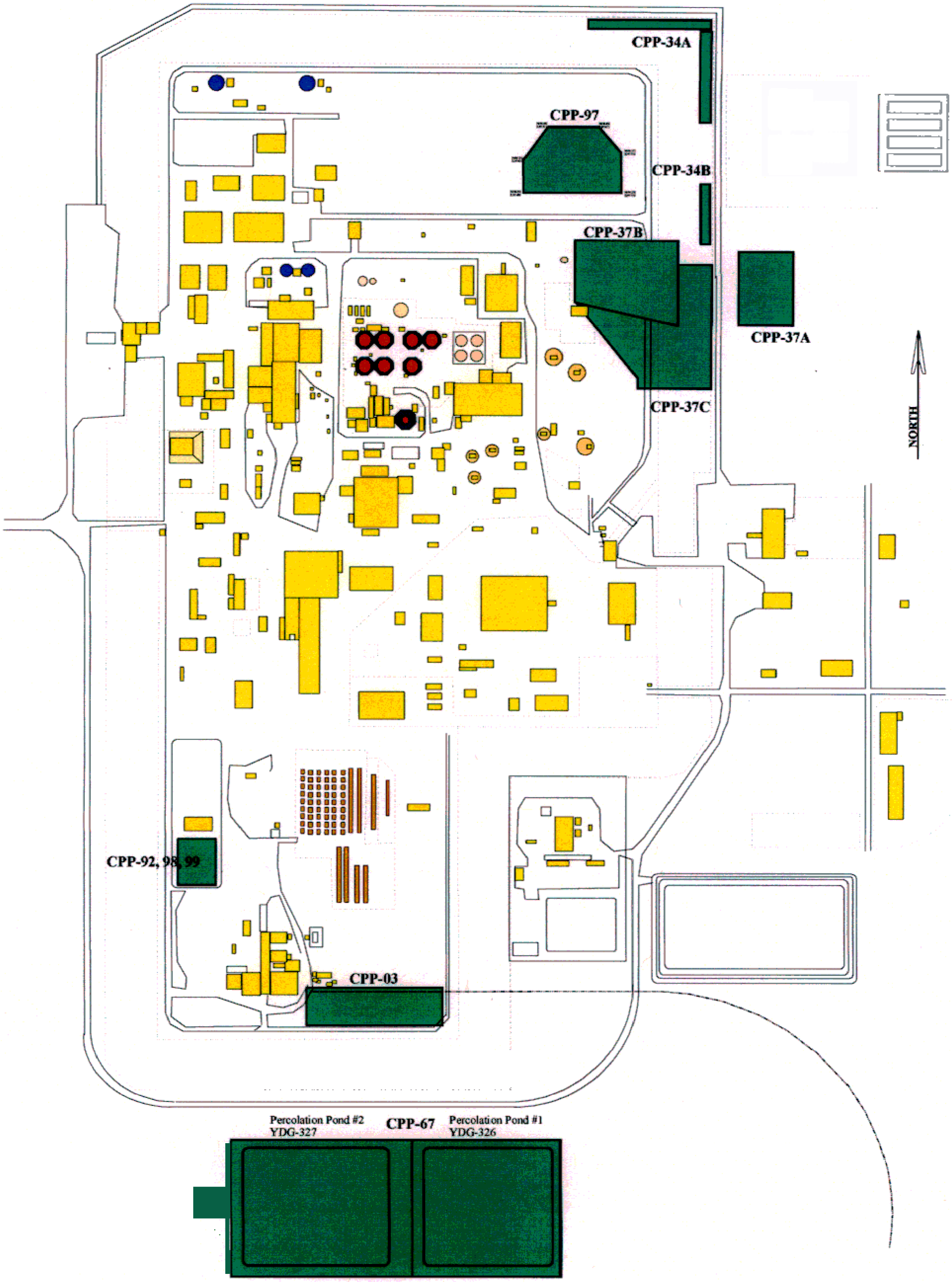

Figure 1-2. OU 3-13, Group 3, Other Surface Soils, Remediation Sets 1-3 (Phase I) sites.

Remediation Set 1:

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

Remediation Set 2:

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

Remediation Set 3:

- CPP-03 – Temporary storage area southeast of CPP-603.
- CPP-37A – Gravel pit outside INTEC fence
- CPP-67 – Percolation Ponds 1 and 2
- CPP-34A/B – Soil storage areas (disposal trenches) in northeast corner of INTEC.

1.3 RD/RA Work Plan Organization

This Work Plan has been developed to present the remedial design for implementing the OU 3-13, Group 3, RAs. The plan and its supporting documents provide details of each remediation site and its associated contaminants, design and regulatory requirements, specific remediation tasks, project organization, schedules, and cost estimates. Brief descriptions of the sections and appendixes of this plan and the attachments are provided in the following:

- 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.
- Section 2, Organization, identifies the project team members and the organizational structure for this project.
- Section 3, Existing Data Summary, presents a summary of the process knowledge and existing data for each remediation site, including I-129 data and extent of contamination. Existing data are presented in table format in Appendix A.
- Section 4, Design Basis, 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 all applicable regulatory requirements.

- Section 5, 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 6, Remedial Action Work Plan, describes the controls and protocols developed for the Group 3 RAs, and discusses the interface between the contractor and subcontractor for each remediation task. This section also includes the project cost estimate and schedule; identifies relevant changes to the RD/RA Scope of Work (SOW); outlines the inspection requirements and documents, and the RA report requirements; describes waste management and tracking for the remediation sites; and summarizes the project Health and Safety Plan (HASP) requirements.

- Section 7, Five-Year Review, discusses the requirements for 5-year reviews of the remedies to ensure protectiveness of the remedies.

- Section 8, References, lists the references used to prepare this Work Plan.

- Appendix A—Existing Data Summary Tables. This appendix contains tables of existing sampling and analytical data for all of the Phase I sites.

- Appendix B—Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 1-3 (Phase I) Design Drawings.

- Appendix C—Project Cost Estimate.

- Appendix D—Project Schedule.

- Appendix E—Prefinal Inspection Checklist.

- Attachment 1—Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 1-3 (Phase I) Field Sampling Plan, DOE/ID-11091.

- Attachment 2—Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 1-3 (Phase I) Characterization Plan, DOE/ID-11090.

- Attachment 3—Analysis of Potential Air Emissions from Excavation of WAG 3 Soil Contamination Sites, EDF-3902.

- Attachment 4—Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 1-3 (Phase I) Health and Safety Plan, INEEL/EXT-03-00628.

- Attachment 5—Earthwork Quantities for Subproject 6, OU 3-13, Group 3, Other Surface Soils Project, EDF-3778.

- Attachment 6—Operable Unit 3-13, Group 3, Other Surface Soils Remediation Sets 1-3 (Phase I) Waste Management Plan, DOE/ID-11092.

2. ORGANIZATION

The organizational structure for this project reflects the managerial and oversight resources governing the performance of work, while minimizing risks to workers' health and safety, the environment, and the public. Figure 2-1 below and the following sections outline the responsibilities of the key personnel.

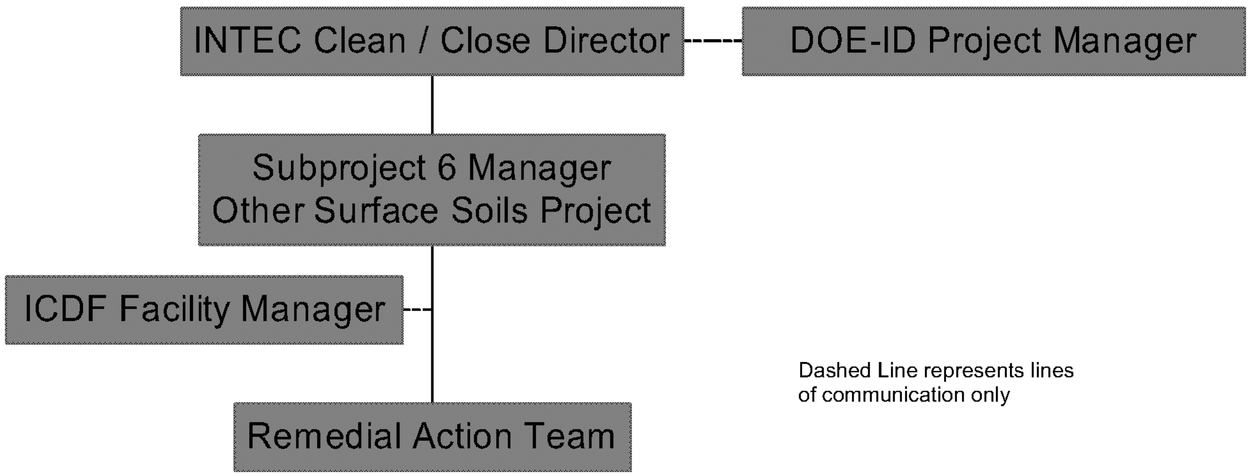

Figure 2-1. OU 3-13, Group 3, Phase I organizational structure.

2.1 NE-ID Project Manager

The Department of Energy Idaho Operations Office (NE-ID[a]), OU 3-13 remediation project manager (PM) is responsible for DOE oversight of the facility to ensure that the contractor is operating safely and efficiently; the contractor's management system is effectively controlling the conduct of operations and implementing the integrated safety management objectives, principles, and functions; DOE line managers are cognizant of the operational performance of facility contractors; and effective lines of communication between DOE and its operating contractors are maintained during normal operation and following reportable events in accordance with DOE orders and requirements.

2.2 INTEC Clean/Close Director

The INTEC Clean/Close project director has the ultimate responsibility for the technical quality of all projects, maintaining a safe environment, and the safety and health of all personnel during field activities performed by or for the program. The director provides technical coordination and interfaces with the NE-ID Environmental Support Office. The director ensures the following:

- Project/program activities are conducted according to applicable federal, state, local, and company requirements and agreements.
- Program budgets and schedules are approved and monitored to be within budgetary guidelines.

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a. NE-ID signifies that the U.S. Department of Energy (DOE), Idaho Operations Office reports to DOE Office of Nuclear Energy, Science, and Technology (NE).

- Personnel, equipment, subcontractors, and services are available.

- Direction is provided for the development of tasks, evaluation of findings, development of conclusions and recommendations, and production of reports.

2.3 Subproject 6 Project Manager

The Subproject 6 (SP-6) project manager (PM) shall ensure that all Group 3 RA activities conducted during the project comply with company management control procedures (MCPs) and program requirements documents (PRDs). The PM will ensure that activities conducted during the project comply with company MCPs and PRDs; that activities comply with applicable Occupational Safety and Health Administration, EPA, DOE, Department of Transportation, and State of Idaho requirements; and that tasks comply with applicable company policies and procedures, the Quality Assurance Project Plan (DOE-ID 2002b), the project HASP (Attachment 4), and the project Field Sampling Plan (FSP) (Attachment 1). The PM is responsible for coordination of document preparation, field, laboratory, and modeling activities. The PM is responsible for the overall work scope, schedule, and budget.

2.4 ICDF Facility Manager

This position is responsible for ensuring the ICDF is operated within the approved authorization basis, operates within regulations, and provides protection of human health and the environment. The facility manager defines specific areas of responsibility for the ICDF operations and maintenance team members. The facility manager also (1) ensures that the appropriate interface agreements are developed, personnel are trained and qualified for their job assignments, and INEEL and ICDF policies and procedures are followed and (2) works to establish the budget for safe operations.

3. EXISTING DATA SUMMARY

This section presents a summary of the process knowledge and existing data available for each of the Group 3 sites. This section also includes the sampling and analysis data for each site, the ICDF landfill Waste Acceptance Criteria (WAC), and the ROD-identified remediation goals (RGs) that are provided in table format in Appendix A, which includes references to the data sources reviewed and used to develop each table including the physical extent of each site, as well as the extent of contamination based on existing data.

In addition, the INTEC waste processing was reviewed to determine if I-129 would be expected in the Group 3 remediation sites and if additional sampling would be necessary for this constituent. The fission process in nuclear reactors is well understood and documented. Fission of U-235 generates a variety of fission products. Nuclear fission produces large quantities of some products and small quantities of others. The quantities and species of fission products are documented in such nationally accepted computer codes as ORIGEN2. The activity of Cs-137 generated in a reactor is relatively large, while the activity of I-129 is relatively small. The fission of 1 gram-mole of U-235 generates approximately 740 Ci of Cs-137 and 1.7 E-04 Ci of I-129. This is a Cs-137:I-129 ratio of about 4.4 million:1. Over time, radioactive decay slowly changes that ratio. I-129 has a very long half-life (approximately 16 million years), while Cs-137 has a half-life of about 30 years. Thus, the Cs-137:I-129 ratio drops to 2.2 million:1 after 30 years, and 1.1 million:1 after 60 years. The amounts and ratios of Cs-137 and I-129 do not differ significantly with the fission of U-233, U-235, and Pu-239 or with the fuel type (cladding, fuel configuration, reactor type, uranium burnup, etc.). The only significant factor affecting the ratio is the decay time of Cs-137.

The following provides an overview of the design/operation of the waste systems at INTEC in relation to Cs-137 and I-129 concentrations. 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 the Cs-137:I-129 ratio of about 1 million: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. Therefore, the Cs-137:I-129 ratio in calcine is much higher than 1 million:1. INEEL I-129 studies show 1% or less of the I-129 in the fuel was retained in the calcine. Therefore, the Cs-137:I-129 ratio in calcine is 100 million:1, or more. As a result, liquid waste from calcinations-related processes can be either depleted in I-129 or enriched in I-129 (relative to tank farm waste). Liquid waste originating from calcine, such as calciner bed dissolutions, were 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 the calciner off-gas line, was enriched in I-129. Although these streams were enriched in I-129, the ratio of Cs-137:I-129 is not known.

The Process Equipment Waste (PEW) evaporator system, like the calciner, was another process that partitioned I-129 from other radionuclides. The PEW evaporator collected dilute wastes from a variety of plant sources. These included cell floor drains, equipment decontamination solution, ion exchange regeneration solution, etc. The waste sources included waste that was enriched, depleted, and the same as tank farm waste in terms of the Cs-137:I-129 ratio. The evaporator concentrated dilute waste by thermal evaporation. The evaporation process generated two waste streams. One waste stream, the evaporator concentrate (also called “bottoms”), was a very small, concentrated volume. Most of the nonvolatile constituents in the waste, such as Al and Cs, were in the evaporator bottoms. The evaporator bottoms were sent to the tank farm for storage. The evaporator bottoms were typically 1-2% of the volume of feed solution. The second waste stream, the evaporator process condensate, was a large volume

(98-99% of the feed solution), consisting of water formed from condensing the water vapor emitted from the evaporator. The evaporator condensate contained only trace quantities of nonvolatile constituents. Cs-137 and I-129 behaved differently in the PEW evaporator. Cs-137 was nonvolatile and accumulated in the evaporator bottoms. Very little Cs-137 was found in the evaporator condensate. On the other hand, I-129 was volatile in the evaporator process. Most of the I-129 in the evaporator feed went into the evaporator condensate. Because so little Cs-137 was in the evaporator condensate, the Cs-137:I-129 ratio in the condensate was about 10:1, instead of 1 million:1 as in first-cycle tank farm waste.

Based on this information, the sites identified as potentially contaminated with PEW evaporator condensate and/or WCF condensate waste will be sampled for I-129 per the Characterization Plan, DOE/ID-11090, Attachment 3 to the Work Plan. Those sites are CPP-92/99, CPP-97, CPP-34 A/B (data representative of CPP-03), and CPP-67. Any site associated with only tank farm wastes would not be sampled for I-129 since this contaminant is not expected to be present at detectable concentrations.

3.1 CPP-97

3.1.1 Process Knowledge

Site CPP-97, located in the northeast portion of INTEC, includes two tarp-covered soil stockpiles and the contaminated surface soil surrounding the piles. The piles were generated from waste soil that originated from the tank farm upgrade project conducted during 1993, 1994, and 1995. One pile contains approximately 1,093 m^3 (1,430 yd^3) of radionuclide-contaminated soils. The second soil stockpile contains approximately 53 m^3 (70 yd^3) of radionuclide-contaminated soils. This upgrade project was divided into five areas within the INTEC tank farm. Areas 1, 2, and 3 are located on the north end of the tank farm. Area 4 is located on the west side with Area 5 on the south side. Process knowledge indicates that there were no known leaks of radioactive contamination from process lines and no Environmentally Controlled Areas (ECAs) within Areas 1-4. Any potential contamination would have resulted from the tank farm; therefore, I-129 is not expected to be present at detectable concentrations. Soil from these areas went to the larger, low-level stockpile. Area 5's contamination is attributed to leaks from process lines identified as ECAs and from releases associated with WCF condensate. Soils from Area 5 could potentially contain I-129. Soil from this area was placed in the second, smaller stockpile.

The physical boundaries of Site CPP-97 are well defined. The recent radiological surveys defined the lateral extent of radiological contamination in the area surrounding the piles.

3.1.2 Previous Investigations

Radiation measurements at the time of generation ranged between 0 and 3 mR/hr for the 1,093-m^3 (1,430-yd^3) pile and 3 to 50 mR/hr for the 53-m^3 (70-yd^3) pile. Previous sampling activities at CPP-97 focused primarily on radiation measurements of the two soil piles themselves and gamma spectrometry measurements of the surrounding surface area to define the site boundary. Eleven samples were collected in July 1995 from the CPP-97 soil piles at undisclosed locations resulting in two contaminants of concern (COCs) exceeding the ROD RGs (Cs-137 at 114 pCi/g and Sr-90 at 330 pCi/g). There were no organic analyses performed; there were 23 inorganic and 17 radionuclide analyses performed. There was no I-129 analysis performed for these samples.

In March 2003, a radiological survey of the area surrounding the soil piles was performed to ensure that the area currently controlled as a radiological management area includes the appropriate areas and that the extent of contamination is identified with institutional controls relative to the existing area (windblown contamination from the soil piles was suspected). The CPP-97 institutional control boundary area was surveyed and levels up to 200 mR/h were measured. Thirty-five in situ gamma spectrometry measurements were then taken to establish a radiation profile to characterize the Cs-137 distribution around the pile perimeters.[b] Results of this survey indicated that Cs-137 concentrations ranged from 2.3 to 106 pCi/g, with some of the high measurements detected near the institutional control boundary. A second survey was requested to more accurately define the lateral boundaries of the Cs-137 distribution.[c] The results of these 26 in situ gamma measurements resulted in the boundary of Site CPP-97 being expanded to encompass all areas with Cs-137 values exceeding the soil RG limits identified in the OU 3-13 ROD.

3.2 CPP-92

3.2.1 Process Knowledge

Site CPP-92 is containerized waste located in the southwest portion of INTEC, west of CPP-1617, in Staging and Storage Annex (SSA) CPP-1789. This site consists of 653 boxes containing soil (571 boxes) and soil/debris (82 boxes) that were generated from various INTEC plant projects, including

- Tank farm upgrade.
- Various CERCLA remediation projects.
- Building CPP-603 cleanup.
- Construction of the emergency fire exit tunnel for Building CPP-604/605 (Site CPP-89). The excavated soils were part of the tunnel excavation just south of and under CPP-604.
- Miscellaneous soil excavations at INTEC where soil contamination was encountered.
- Cleanup of soil and debris at Site CPP-17. Site CPP-17 was divided into two separate sites, CPP-17A and CPP-17B. These sites were used for storing piles of soil and debris that reportedly came from a variety of construction and maintenance activities within the INTEC.

The OU 3-13 ROD identified that CPP-92 had 648 boxes. However, through the use of the Integrated Waste Tracking System (IWTS) and physical inventories, 653 boxes have been identified by Waste Generator Services (WGS). There are two different sizes of boxes associated with this site: 0.6 x 1.2 x 1.2-m (2 x 4 x 8-ft) and 1.2 x 1.2 x 2.4-m (4 x 4 x 8-ft). Both sizes of boxes are constructed of 1.9-cm (0.75-in.) plywood and are lined with a polyethylene membrane liner.

Because the wastes are contained in boxes in a designated storage area, the physical boundaries for Site CPP-92 are well defined and documented. In addition, because this site is associated with releases from the PEW evaporator, I-129 is expected in the waste.

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b. Thompson, K.C. and C. P. Oertel, INEEL, to W. P. Boyd, INEEL, March 23, 2003, "INTEC Soil Pile Results," Idaho National Engineering and Environmental Laboratory, Interoffice Memorandum.

c .Thompson, K.C. and C. P. Oertel, INEEL, to W. P. Boyd, INEEL, April 8, 2003, "INTEC Soil Pile Boundary Results," Idaho National Engineering and Environmental Laboratory, Interoffice Memorandum.

3.2.2 Previous Investigations

According to the Track 1 report for Site CPP-92 (LITCO 1995) in Appendix A, contaminant concentrations from the excavation in the tank farm, the Building CPP-603 cleanup, and Site CPP-17 are much lower than concentrations in the Site CPP-89 boxed soil, which was contaminated by various releases from pipeline leaks including nitric acid and condensates from the PEW evaporator system.

Radiation surveys of the soil and debris piles (Site CPP-17) performed in 1991 indicated radioactivity levels ranging from 100 to 22,000 counts per minute (cpm). During containerization of the soil, grab samples were collected from the Site CPP-89 and Site CPP-17A/B waste that was placed into waste containers at CPP-92 and analyzed for radiological constituents and by the toxicity characterization leaching procedure for metals. Twenty-five samples were collected at the two sites (five samples from CPP-17A, two samples from CPP-17B, and 18 samples from CPP-89). There were no organic analyses performed; three inorganic analyses and 15 radionuclide analyses were performed. These results, summarized in Appendix A, indicate that Cs-137 and Sr-90 RGs were exceeded (7,730 pCi/g and 10,800 pCi/g, respectively). One sample was analyzed for I-129 at CPP-89, with a reported value of 3.1 pCi/g, which is at the WAC limit for I-129.

Boxed soil from the excavation for the fire exit from Building CPP-604/605 (Site CPP-89) was sampled and analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), inorganics, and radionuclides. Neither VOCs nor SVOCs were detected in the samples. The only inorganics detected above background (Rood et al. 1995) were arsenic at 5.9 mg/kg and mercury at 10.4 mg/kg.

Radionuclides were detected above background in the samples at the following maximum concentrations: Am-241 (23.6 pCi/g), Cs-137 (7,730 pCi/g), Pu-238 (259 pCi/g), Pu-239/240 (24.7 pCi/g), Sr-90 (10,800 pCi/g), U-234 (5.1 pCi/g), and I-129 (3.1 pCi/g).

3.3 CPP-98

3.3.1 Process Knowledge

Site CPP-98 is containerized waste consisting of 119 boxes of debris located in the southwest portion of INTEC, west of CPP-1617, in the SSA. These boxes contain wooden shoring used during the tank farm upgrade project. The OU 3-13 ROD identified that CPP-98 had 118 boxes (DOE-ID 1999). However, through the use of the IWTS and a physical inventory, 119 boxes have been identified by WGS. Because the tank farm soil was contaminated, the shoring also became contaminated and was placed into 0.6 × 1.2 × 1.2-m (2 × 4 × 8-ft) and 1.2 × 1.2 × 2.4-m (4 × 4 × 8-ft) wooden waste boxes lined with a polyethylene membrane.

Because the wastes are contained in boxes in a designated storage area, the physical boundaries for Site CPP-98 are well defined and documented. Additionally, releases for this site are not associated with PEW evaporator waste; therefore, I-129 is not expected at a detectable concentration.

3.3.2 Previous Investigations

No analytical data are available for the contaminated wooden shoring used during the tank farm upgrade project. Data are available for the corresponding contaminated soils that were excavated as part of the same project (Site CPP-97). Therefore, the soil data from Site CPP-97 are assumed to be representative of the expected contamination on the containerized debris.

3.4 CPP-99

3.4.1 Process Knowledge

Site CPP-99 is a group of boxes located in the southwest portion of INTEC, west of CPP-1617, in the SSA. This site consists of 58 boxes containing radionuclide-contaminated soil (14 boxes), soil/debris (43 boxes), and unknown contents (1 box) generated from the tank farm upgrade and CPP-604/605 emergency fire tunnel excavation projects. The OU 3-13 ROD identified that CPP-99 had 59 boxes (DOE-ID 1999). However, through the use of the IWTS and a physical inventory, 58 boxes have been identified by WGS. The boxes are 0.6 × 1.2 × 1.2-m (2 × 4 × 8-ft) and 1.2 × 1.2 × 2.4-m (4 × 4 × 8-ft) wooden waste boxes lined with a polyethylene membrane.

Because the wastes are contained in boxes in a designated storage area, the physical boundaries for Site CPP-99 are well defined and documented.

3.4.2 Previous Investigations

No analytical data are available for the contaminated wooden shoring used during the tank farm upgrade project. Data are available for the corresponding contaminated soils that were excavated as part of the same projects (Sites CPP-97 and CPP-92). Therefore, the soil data from Sites CPP-97 and CPP-92 are assumed to be representative of Site CPP-99. Additionally, data are also available for the excavated soil from the excavation for the fire exit from Building CPP-604/605 (Site CPP-92) and are assumed to be representative of Site CPP-99, as well.

3.5 CPP-37B

3.5.1 Process Knowledge

Site CPP-37B consists of Gravel Pit #2, which is located in the northeast corner inside the INTEC security fence; before being backfilled, it 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 waters 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 waters discharged to the pit were likely to have contained radionuclides.

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 1992a), and the 1991 geophysical survey. However, when reviewing CERCLA documents and aerial photos related to new Site CPP-37C (discussed below), 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.

3.5.2 Previous Investigations

Soil samples were collected from four boreholes (CPP 37-1, -2, -3, and -4) in Pit #2 in 1991 (GAI 1992a and LITCO 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) below land surface 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, VOCs, SVOCs, 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 WAC.

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) below ground surface (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.

No RGs were exceeded for any sample at CPP-37B.

3.6 CPP-37C

3.6.1 Process Knowledge

Site CPP-37C, a new site established in 2002, 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, and 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.

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 PEW 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 INEEL 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.

3.6.2 Previous Investigations

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/minute (cpm) with a Ludlum 2A survey instrument.

Piping and soil was sampled for total metals, total VOCs, total SVOCs, 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 SSA had radiological contamination in excess of limits for acceptance at the INEEL Landfill at CFA. 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 (HPGD). Soil that exceeded the OU 3-13 RGs was containerized for management as CERCLA waste at the SSA.

The I-129 sample results for the debris and soil were all statistical nondetects or false positives. However, the holding time requirement for I-129 analysis of 28 days was exceeded for all samples and the results were qualified with a "UJ" validation flag.

3.7 CPP-03

3.7.1 Process Knowledge

Site CPP-03 is the location of a former temporary storage area southeast of the Fuel Receiving and Storage Facility at Building CPP-603. The dimensions of Site CPP-03 are approximately 45.7 × 152.4 m (150 × 500 ft). The area, commonly referred to as the "boneyard," was used to store old and abandoned, radioactively contaminated equipment such as tanks, valves, and fuel casks. The storage area was decommissioned in the late 1970s, and all contaminated equipment was packed into standard wooden radioactive-waste boxes and taken to the Radioactive Waste Management Complex (RWMC). The top several inches of underlying soil were contaminated due to the storage of equipment in the area. Most of the contaminated soil was removed, boxed, and sent to RWMC for disposal. Approximately 0.3 m (11 in.) of uncontaminated soil have been placed over the area and graded to a level surface.

During the summer of 1983, radioactively contaminated soil was encountered when workers began to replace Tank WL-102 (in the tank farm area of INTEC). Approximately 340 m^3 (12,000 yd^3) of excavated contaminated soil (less than 30 mR/hr) from the WL-102 tank replacement project was temporarily stored at Site CPP-03. The contaminated soil was moved later the same year and placed in trenches in the northeast corner of the Idaho Chemical Processing Plant (ICPP) (CPP-34A/B). The contaminated soil was characterized after it was placed in the trench and was shown to contain concentrations of lead, mercury, and silver above background levels (Rood et al. 1995), but not exceeding extraction procedure-toxicity levels. The soil also contained bis(2-ethylhexyl)phthalate. Radiological analyses performed indicated low concentrations of Pu-238, Np-237, U-234, U-238, Cs-137, and Sr-90. Because the source of this waste is associated with releases from the tank farm and WCF condensate, potential contamination will include organic, inorganic, and radiological constituents, including I-129.

The physical boundaries of Site CPP-03 are well defined by Willow Avenue to the south, Evergreen Street to the east, and the railroad tracks to the north.

3.7.2 Previous Investigations

Based on historical information, which indicates that the most contaminated material was stored in the eastern 20% of Site CPP-03, a radiation survey was performed on October 18 and 19, 1993, in the temporary storage area adjacent to Building CPP-603. The eastern 20% of the CPP-03 area, measuring 30.5 × 45.7 m (100 × 150 ft), was divided into 176, 3.0 × 3.0-m (10 × 10-ft) grids and surveyed. The remaining 80% of the area, measuring 121.9 × 45.7 m (400 × 150 ft), was divided into 112, 7.6 × 7.6-m (25 × 25-ft) grids and surveyed. Background levels in the eastern 20% area ranged between 80 cpm and 200 cpm, while a majority of the surface readings taken in the grids ranged between 100 cpm and 400 cpm. However, two locations in the northeastern corner of the area showed surface radioactivity of 1,000 cpm and 4,400 cpm.

Radiation levels in the remaining western 80% of Site CPP-03 ranged between 60 cpm and 20,000 cpm, with a majority of the readings between 100 cpm and 200 cpm. Three hotspots located in the northwestern corner of the site included readings of 7,000, 13,000, and 20,000 cpm; and one hotspot, located near the center of the site, had a reading of 4 mR/hr. Results of the field radiation survey are included in the OU 3-09 Preliminary Scoping Track 2 Summary Report (LITCO 1995).

The 11 in. of soil placed over the site may be providing an unknown amount of shielding, and higher levels of radiation may be encountered below the 0.3-m (11-in.) depth. If an even layer of soil was placed over the area, it can be assumed the soil would be providing an even amount of shielding and the hotspots identified from the field survey would still represent the areas of highest contamination.

The northeastern corner of Site CPP-03 was resurveyed on December 9, 1993, to determine if contamination extended to the north of the ECA. There was concern contamination may be present outside the area covered by the October survey. A 6.0 × 9.1-m (20 × 30-ft) area was surveyed, and radiation levels were only slightly above background levels. Personnel performing the field survey had to scrape away several inches of snowfall covering the ground at each location before radiation measurements could be taken. Since the two radiation surveys were taken at separate times and under different field conditions, the data from the December survey can only be used for comparison to the October data. The results of the survey are included in Appendix B of the OU 3-09 Track 2 Sampling and Analysis Plan (WINCO 1994).

Three Track 2 soil borings in Site CPP-03 were located based on the results of the October 1993 radiological survey (LITCO 1995). One soil boring was drilled in the eastern 20% of the 45.7 × 152.4-m (150 × 500-ft) area. The other two sample borings were drilled in the remaining area of Site CPP-03. The three soil borings were extended to an approximate depth of 3.0 m (10 ft) bgs.

A soil sample was collected between 0 to 0.15 m (0 to 0.5 ft) bgs in each of the three boreholes. Continuous samples were taken between 0.15 to 1.2 m (0.5 to 4 ft) bgs using split-spoon samplers, and the sample collected from the interval having the highest radiation level was sent for laboratory analyses. Continuous samples were also taken between 1.2 to 3.0 m (4 to 10 ft), and the sample collected from the interval having the highest radiation level was also sent for laboratory analyses. Radiation levels of soils at 3.0 m (10 ft) bgs were at or below background levels for each of the three CPP-03 boreholes; therefore, the boreholes were not extended to the soil/basalt interface.

The results of the nine samples collected in boreholes CPP-03-1, CPP-03-2, and CPP-03-3 are summarized in Appendix A and indicate that Cs-137 was the most widely distributed radionuclide in samples from CPP-03. Cs-137 was detected at activity levels above background in surficial samples from each sample boring at CPP-03 at activities ranging from 65.1 pCi/g at CPP-03-2 to 1.4 pCi/g at CPP-03-1. Cs-137 was also detected at activities above background in samples collected from 0.15 to 0.6 m (0.5 to 2.0 ft) in borings CPP-03-1 and CPP-03-3, and from 0.15 to 0.45 m (0.5 to 1.5 ft) at boring CPP-03-2. Cs-137 activities in those samples ranged from 24.4 pCi/g at CPP-03-2 to 1.96 pCi/g at CPP-03-1. Sr-90 was also detected in surficial samples from CPP-03-2 and CPP-03-3, at activities ranging from 43.9 pCi/g to 16 pCi/g. Samples from this site were not analyzed for I-129.

Based on these sample results, the primary COC at this site is Cs-137. Cs-137 was detected at activity levels greater than background in all six surface or near-surface samples collected at Site CPP-03. Cs-137 exceeds the ROD-defined RG of 23 pCi/g in CPP-03-2 and CPP-03-3.

A ground-penetrating radar (GPR) survey was performed by Westinghouse Idaho Nuclear Company (WINCO) personnel over the eastern one-half of Site CPP-03 on June 27, 1994, to determine whether pieces of construction debris may have been buried in a trench in the area. The GPR survey was spaced at 7.6-m (25-ft) intervals, and the survey equipment could detect subsurface anomalies to approximately 2.4-m (8-ft) bgs. No large pieces of debris were detected, and the GPR equipment observed only small miscellaneous debris (such as small pieces of pipe).

3.8 CPP-37A

3.8.1 Process Knowledge

Site CPP-37 consists of Gravel Pit #1, which is located outside of the INTEC security fence in the northeast corner and measures approximately 43 m (140 ft) wide, 64 m (210 ft) long and 4.3 m (14 ft) deep. No information is available on the date pit usage began; however, Pit 1 was used for decontamination of radiologically contaminated construction equipment during July and October 1983. In addition, during 1982 and 1983, the pit was used as a percolation pond for INTEC service wastewater while the injection well was being refitted. This pit received stormwater runoff from INTEC until August 2003. The extent of Site CPP-37A is known, as the physical boundaries of the pit are well defined, and the use and disposal practices at this site are well documented.

3.8.2 Previous Investigations

Soil samples were collected from several boreholes in Pit #1 in 1991 (GAI 1992a and LITCO 1995). The pit was divided in three areas for the purpose of collecting near-surface soil samples. Three shallow borings were drilled in each area, and samples were collected at depths of 0 to 0.3 m (0 to 0.5 ft), 0.3 to 0.6 m (1 to 2 ft), and 1.5 to 1.8 m (5 to 6 ft) below the bottom of the pit in each boring. Samples were composited from the same depths in each area for analysis (excluding the VOC samples). In addition to the near-surface soil samples, one deeper borehole was drilled in the center of the pit from which soil samples were collected at 1.5-m (5-ft) intervals to the soil/basalt interface at approximately 9 m (30 ft). The samples were analyzed for inorganics, VOCs, SVOCs, pesticides/herbicides, PCBs, and radionuclides.

The data, summarized in Appendix A, indicate that arsenic was detected above background (Rood et al. 1995) in several samples. However, the maximum arsenic concentration was only 8.7 mg/kg relative to the background value for arsenic of 5.8 mg/kg.

Radionuclides detected above background in soil samples collected in Pit #1 were Am-241, Cs-137, Np-237, Pu-238, and Sr-90. I-129 was analyzed for, but not detected in any sample. Other radionuclides that do not have a background value were detected at low concentrations including (maximum concentrations in parentheses) Co-60 (0.55 pCi/g), U-235 (0.05 pCi/g), and U-238 (3.99 pCi/g). No radionuclides were detected in the 0 to 0.3-m (0 to 0.5-ft) samples except for Sr-90 at 0.69 ±0.12 pCi/g in the southwestern portion of the pit. Radionuclides were not detected above background in the deep borehole below 4.6 m (15 ft).

No RGs were exceeded for any sample at CPP-37A. Eu-152, Eu-154, and Pu-241 are COC constituents that were not analyzed during past sampling. Using Cs-137 as a scaling factor, as described in Section 3.3 of the INEEL CERCLA Disposal Facility Design Inventory (EDF-ER-264), 95% UCL estimates for these values were developed. A comparison of the estimated 95% UCL values to RGs for Group 3 COCs, including Eu-152, Eu-154, and Pu-241, is shown Table 3-1. This comparison illustrates that even if concentration estimates were significantly higher than reasonably expected (several orders of magnitude), the values would still fall below the RGs.

Section 13.2 of the OU 3-13 ROD, "Sites Included in Other Programs or Other OUs," identified that for CPP-37A, "A presumptive remedy of excavate and dispose at the ICDF will be implemented." This decision was based on available data at the time of the development of the OU 3-13 ROD. Data at that time were not complete as they did not include Eu-152, Eu-154, and Pu-241 COCs. Using a Cs-137 scaling factor, it is now possible to provide information on these COCs. In review of this new information, the COCs at CPP-37A do not exceed the OU 3-13 RGs. The presumptive remedy of excavate and dispose at the ICDF is not needed as the cleanup levels are currently met. This new information will be documented in the Phase I Completion Report (Section 6.8.1.2) and the RA Report.

3.9 CPP-67

3.9.1 Process Knowledge

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

SWP-1, established in 1984, is located outside the south INTEC security fence, southeast of CPP-603, and is approximately 125 m (410 ft) long in the east-west direction, 146.3 m (480 ft) long in the north-south direction and approximately 5.5 m (18 ft) deep. The pond was excavated in gravelly alluvium that is approximately 7.6 to 9.1 m (25 to 30 ft) thick and is underlain by basalt (Ebasco 1991).

Table 3-1. Site CPP-37A radionuclide COC concentrations versus RGs.

Contaminant of Concern	95% UCL	Soil Risk-Based Remediation Goal For Single COCs (pCi/g)
Am-241	9.9E-01[a]	2.9E+02
Cs-137	3.6E+00[a]	2.3E+01
Eu-152	1.1E-07[b]	2.7E+02
Eu-154	5.2E-05[b]	5.2E+03
Pu-238	1.4E-01[a]	6.7E+02
Pu-239/240	ND[c]	2.5E+02
Pu-241	5.4E-05[b]	5.6E+04
Sr-90	7.1E-01[a]	2.2E+02

a. Value is the 95% UCL reasonable maximum exposure (RME) as listed in the OU 3-13 ROD.

b. Value is the 95% UCL as estimated in the ICDF Design Inventory.

c. Value based on sample data as reported in Appendix A.

SWP-2 is also located outside the south INTEC security fence, southeast of CPP-603. SWP-2 was established in 1985 when it became apparent that the infiltration capacity of SWP-1 had decreased and water levels began to rise. The pit bottom is approximately 152.4 m (500 ft) square and 3.6 to 4.3 m (12 to 14 ft) deep. The pit was excavated in gravelly alluvium approximately 6.1 to 10.7 m (20 to 35 ft) thick, underlain with basalt. The pond was designed to accommodate continuous disposal of approximately 11.4 M L (3 M gal) of water per day.

Based on sampling conducted during 1991 and reported in 1992 (GAI 1992b), as discussed below, RCRA clean-closure equivalency was achieved for contamination in Pond 1 in April 1994 and Pond 2 in May 1995. The ponds were taken out of service in August 2002.

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

3.9.2 Previous Investigations

3.9.2.1 SWP-1. An initial test pit was excavated in the center of SWP-1 in 1991, followed by the excavation of five test pits (PP1-1 through PP1-5) for sample collection. Samples were collected from the test pits both at the surface and at a greater depth based on visual examination of the initial test pits. The data are summarized in Appendix A.

The visual inspection of the initial center excavation revealed a sand and gravel layer to approximately 1.7 m (5.7 ft) bgs, with fine sand, silt, and clay from 1.7 m (5.7 ft) to the bottom of the pit at 2.2 m (7.4 ft). The sand, silt, and clay unit was the targeted sample interval for Pits 1–5 as the fine-grained sediments are expected to preferentially absorb potential contaminants. Test pit logs with detailed geologic information are summarized in Appendix A of the *Report for the ICPP Sampling and Analysis Program at Service Waste Percolation Pond #1* (GAI 1992b).

After collection of a surface sample, Pits PP1-1, PP1-3, and PP1-4 were advanced to 1.7, 1.5, and 1.6 m (5.5, 5.0, and 5.3 ft) bgs, respectively, and samples collected for radionuclides, organics, and inorganics. At locations PP1-2 and PP1-5, basalt was encountered at 0.7 and 0.8 m (2.4 and 2.7 ft), respectively. No fine-grained unit was observed in Pit PP1-5 with samples collected from coarse-grained sediment above the basalt surface. At Pit PP1-2, samples were collected from a silty clay layer located from 0.6 to 0.7 m (2.1 to 2.4 ft). A general field radiological survey of the percolation pond bottom showed a range of activity from 100 to 300 cpm (relative to the background of 100 cpm) with a reading of 4,000 cpm for sediments below the discharge pipe. It should be noted that the ice and frozen condition of the sediments may have partially shielded the radioactivity to bias screening results low.

3.9.2.2 Radionuclides—Surficial Samples. Am-241 and Sr-90 were detected at four of the five sampling locations within SWP-1; neither was detected in the surficial sample at location PP1-2. Cs-137 was found at the highest activity level at each of the borings, ranging from 80.8 pCi/g at PP1-3 to 11.7 pCi/g at PP1-2. Pu-238 ranged from a high of 13 pCi/g at PP1-3 to a low of 1.61 pCi/g at PP1-1. Am-241 and Sr-90 activities ranged from highs of 7.8 pCi/g at PP1-3 and 16.3 pCi/g at PP1-5, respectively, to lows of 0.56 pCi/g (PP1-4) and 1.21 pCi/g (PP1-5). Samples from locations PP1-1 and PP1-3 each indicated detections above background for 11 radionuclides. All other radionuclides were detected at activities ranging from approximately 1 to 10 pCi/g. I-129 was not detected in any of the surficial soil samples from SWP-1.

3.9.2.3 Radionuclides—Deeper Samples. Deeper samples were collected at each sampling location. Samples were collected at depths of 1.7 m (5.7 ft), 0.7 m (2.3 ft), 1.5 to 1.6 m (5.0 to 5.3 ft), 1.7 m (5.7 ft), and 0.8 m (2.7 ft) for locations PP1-1 through PP1-5, respectively. Sr-90 was one of only two radionuclides detected above background, at activities of 1.14 pCi/g and 1.09 pCi/g in deeper samples from locations PP1-3 and PP1-1, respectively. U-234 was detected at location PP1-4 at an activity of 1.54 pCi/g. I-129 was not detected in any of the deeper soil samples from SWP-1.

3.9.2.4 Conclusions—Distribution. Activities for all radionuclides detected decreased with depth, with the exception of U-234 at location PP1-4, which increased slightly from 1.34 pCi/g (below background) in the surface sample to 1.54 pCi/g in the sample at 1.7 m (5.7 ft) bgs. All other radionuclides decreased to activities either below detection limits or below background in the deeper samples. Samples collected from PP1-3 and PP1-1, which are located closer to the center of the pond, showed both the greatest number of radionuclides at activities above background, and the highest activities for Sr-90, which is the most widely detected radionuclide. Cs-137 exceeded the ROD-identified RG of 23 mg/kg in surface samples at PP1-1, PP1-3, and PP1-4. No radionuclide ***WAC concentrations were exceeded.***

In addition to radionuclides, organics were analyzed, but not detected in any sample. Samples were also analyzed for inorganics. Mercury concentrations exceeded the ROD-defined RG of 23 mg/kg in the surface samples at locations PP1-3 (36.2 mg/kg) and PP1-4 (29.9 mg/kg).

3.9.2.5 SWP-2. Excavation and sampling activities at SWP-2 were conducted from July 23 to July 26, 1991. An initial test pit was excavated in the center of the pond, followed by the excavation of five test pits (SWP2-1 through SWP2-5) for sample collection. The initial pit was excavated to a depth of 2.0 m (6.7 ft) and visually inspected to determine sampling intervals for the five test pits.

The visual inspection revealed no evidence of layers that would provide preferential accumulation of contaminants in the soil profile. Therefore, the sampling intervals in the test pits were selected at 0.0 to 0.6 m (0 to 2 ft) and 1.2 to 1.8 m (4 to 6 ft) to represent the surface and bottom of the excavation. The test pit log and borehole logs are presented in Appendix A of the *Report for the ICPP Sampling and Analysis*

Program at Service Waste Percolation Pond No. 1 (GAI 1992b). Samples were analyzed for radionuclides, organics, and inorganics.

All samples from locations SWP2-1 through SWP2-5 and excavated sediment from the center pit were field-screened with beta-gamma hand-held instrumentation. Additionally, the center of the pond was traversed along a north-south transient and surficial sediments surveyed at arbitrary locations with results ranging from 200 cpm to a maximum of 1,200 cpm. The data are summarized in Appendix A.

3.9.2.6 Radionuclides—Surficial Samples. Surficial samples were collected over the 0.0 to 0.6-m (0.0 to 2.0-ft) interval. Radionuclides were found at activities above background in the majority of the five surficial samples collected at SWP-2, except U-235 and U-238, which were each detected above background only at location SWP2-3. Ce-144 was also detected at location SWP2-5. Cs-137 was the radionuclide detected at the highest activity in all five surficial samples collected. Cs-137 activity ranged from a high of 93.6 pCi/g at SWP2-5 to a low of 38.1 pCi/g at SWP2-3. Five other radionuclides, Co-60, Cs-134, Np-237, Pu-238, and Rh-106, were detected at activity levels above background at all five surficial sample locations. Np-237 activity ranged from a high of 1.63 pCi/g at SWP2-5 to a low of 1.09 pCi/g at SWP2-1. I-129 was detected in the surface samples from locations SWP2-2 (2.1 pCi/g), SWP2-3 (1.5 pCi/g), SWP2-4 (2.8 pCi/g), and SWP2-5 (3.7 pCi/g). It was not detected at location SWP2-1. All other radionuclide detections in surficial samples were at activity levels less than approximately 5.0 pCi/g.

3.9.2.7 Radionuclides—Deep Samples. Deep samples were collected over the 1.2 to 1.8-m (4.0 to 6.0-ft) interval. Np-237 was detected at all five deep sample locations. Np-237 activity levels ranged from 1.11 pCi/g at SWP2-3 to 0.63 pCi/g at SWP2-5. Pu-238 and Pu-239/240 were detected above background at 0.11 pCi/g and 0.5 pCi/g, respectively, at location SWP2-5. I-129 was not detected in any of the deeper soil samples from SWP-2.

3.9.2.8 Conclusions—Distribution. Activities for all radionuclides detected decreased with depth, with the exception of Pu-239/240 at location SWP2-5. Pu-239/240 increased slightly from 0.27 to 0.5 pCi/g. All other radionuclides detected in surficial samples decreased to below detection or below background levels except Np-237, as described above. Cs-137 was detected in all samples, but decreased in activity with distance from sample location SWP2-5, which is near the location of the outfall pipe to SWP-2. Cs-137 exceeded the ROD-identified RG of 23 pCi/g in surface ***samples at all samples locations. No radionuclide WAC concentrations were exceeded.***

Organics were analyzed and concentrations for all detected contaminants were just slightly above the detection limits. Samples were also analyzed for inorganics; no sample exceeded the RG for mercury.

3.10 CPP-34A/B

3.10.1 Process Knowledge

Site CPP-34 is the soil storage area in the northeast corner of INTEC. In the summer of 1983, about 9,180 m^3 (12,000 yd^3) of contaminated soil was excavated from around the WL-102 tank in the tank farm area northeast of Building CPP-604 and stockpiled at Site CPP-03, to the east of Building CPP-603. In August and September 1984, the pile of contaminated soil was removed from CPP-03 and buried in three trenches in the northeastern corner of the ICPP, situated between the animal (outer) and security (inner) fences. Because this site is associated with releases from the tank farm and WCF condensate, I-129 may be present at very low concentrations.

The dimensions of the trenches are 13.7 m (45 ft) wide at the top, 7.6 m (25 ft) wide at the bottom, and approximately 4.3 to 4.9-m (14 to 16-ft) deep. The lengths of the trenches are 126 m (413 ft), 122 m (400 ft), and 74 m (242 ft). It was reported in the Track 1 (WINCO 1993) that at the time of disposal, the contaminated soil in the trenches was covered with approximately 0.6 m (2 ft) of clean soil.

The extent of sites CPP-34A and B is known, as the boundaries of the trenches are well defined based on documented process knowledge and analytical data.

3.10.2 Previous Investigations

A radiological survey was conducted before moving the contaminated soil to the CPP-34 trenches. Radionuclides in the contaminated soil included Co-60, Cs-137, Eu-154, Eu-155, Sr-90, Pu-238, and Pu-239/240. The external exposure readings from the contaminated soil were generally 2 to 3 mR/hr at 10 cm (4 in.), with maximum readings of less than 30 mR/hr (WINCO 1984). Ninety-nine percent of the sample activity was due to the presence of Cs-137 and Sr-90. In addition to the radionuclides detected in the soil, other radionuclides potentially associated with tank farm wastes include antimony, neptunium, americium, uranium, and iodine (WINCO 1989).

Four borings (CPP-34-01 through CPP-34-04) were drilled through the trench backfill in January of 1990. Samples were collected continuously from the ground surface to a depth of 6.1 m (20 ft). Samples were collected with a California split spoon sampler except for the 0 to 0.6-m (0 to 2-ft) interval where grab samples were collected from the cuttings due to frozen ground. Samples collected in borings CPP-34-01, -03, and -04 were analyzed for radionuclides, inorganics, and a target list of VOCs. Samples from boring CPP-34-02 were analyzed for radionuclides, inorganics, a full suite of VOCs and SVOCs, organochlorine pesticides, PCBs, herbicides, and dioxins. The results were reported in the *Report for the Idaho Chemical Processing Plant Drilling and Sampling at Land Disposal Unit CPP-34* (GAI 1990).

The data, summarized in Appendix A, indicate the only inorganics detected above background concentrations (Rood et al. 1995) in the samples were arsenic, lead, and mercury. Arsenic was detected in three of 20 samples at concentrations just above background. Lead was detected above the background concentration in two of 20 samples Mercury was also detected above background in two of 20 samples, but did not exceed the RG established for mercury of 23 mg/kg (DOE-ID 1999). The data also indicate that there are no VOCs or SVOCs at these sites.

Radionuclides detected in the samples at concentrations above background include Cs-137, Pu-238, Sr-90, U-234, and U-238. Cs-137 and Sr-90 were detected in the highest concentrations. Although the contaminated soil in the trenches was reportedly covered with 0.6 m (2 ft) of clean fill, concentrations of Cs-137 and Sr-90 are above background in surficial soil at all four boring locations. Cs-137 was detected above background in all five samples from borings CPP-34-02 and -03, four of the five samples from boring CPP-34-01, and two of the five samples from boring CPP-34-04. Additionally, Cs-137 concentrations exceeded the RG of 23 pCi/g in three of the five samples from boring CPP-34-01, two of the five samples from borings CPP-34-02 and -03, and one of the five samples from boring CPP-34-04. Sr-90 was detected above background in all but one sample from all four borings, and concentrations of Sr-90 exceeded its RG of 223 pCi/g in three of the five samples from boring CPP-34-01, one of the five samples from borings CPP-34-02 and -04, and two of the samples from boring CPP-34-03. Samples from sites CPP-34A and B were analyzed for I-129 and it was not detected in any sample; however, in two of the samples the detection limit was above the RG concentration.

Based on these results, the primary COCs at this site are Cs-137 and Sr-90. The highest concentrations of these radionuclides are primarily at depths between 1.8 to 3.7 m (6 to 12 ft) and extend downward to 4.9 m (16 ft) in the area of boring CPP-34-01. Concentrations of these radionuclides decrease with depth but are still above background at 5.5 to 6.1 m (18 to 20 ft) in most areas. The zone of contamination assumed for this site is from 0 to 6.1 m (0 to 20 ft).

4. 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 INEEL 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. The remedy will also eliminate the potential threat to the underlying Snake River Plain Aquifer (SRPA) from possible leaching of residual contamination at the Group 3 sites.

The following discussions present the remedial action objectives (RAOs), design assumptions, applicable and appropriate requirements, DOE-related codes, standards and documents, engineering standards, status of ROD assumptions, quality assurance (QA) program requirements, uncertainty management, and unresolved data needs related to the remedial design for the Group 3 sites.

4.1 Remedial Action Objectives

The following are the RAOs for the Group 3 soils, as developed in the OU 3-13 ROD (DOE-ID 1999, p. 8-2):

- Prevent exposure to contaminated surface soils at each release site such that for all surface exposure pathways, a cumulative carcinogenic risk of 1×10^{-4} and a total hazard index (HI) of 1 is not exceeded at each release site. These RAOs 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 RAOs will be achieved as follows:
  - DOE Operational Phase: expected until year 2045:
    a. 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.
    b. 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:
    a. Implement institutional controls to limit the duration and frequency of exposure to noncapped contaminated soil areas by the public to achieve a cumulative carcinogenic risk of 1×10^{-4} and a total HI of 1.
    b. 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.
    c. 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.

- Postgovernment Control, Beyond 2095:

  a. 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 RAOs, RGs were established in the OU 3-13 ROD (DOE-ID 1999, p. 8-4) to ensure a risk-based protectiveness of human health and the environment. These contaminant-specific goals, summarized in Table 4-1, are quantitative cleanup levels based primarily on applicable or relevant and appropriate requirements (ARARs) and risk-based doses.

The primary threat posed by the Group 3, Other Surface Soils is external exposure to contaminated soils (DOE-ID 1999, p. 8-7). The RG for the Other Surface Soils sites is to prevent external exposure to current workers and nonworkers and future workers and residents by:

- Implementing the institutional controls established for OU 3-13 sites.
- Minimizing future residential exposure to surface soils in 2095 and beyond by excavating the contaminated soils exceeding the RGs 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).

The RAO for groundwater, as related to contaminated soils, is as follows:

- Maintain caps placed over contaminated soil or debris areas that are contained in place and the closed ICDF-complex, to prevent the release of leachate to underlying groundwater which would result in exceeding a cumulative carcinogenic risk of 1×10^{-4} a total HI of 1, or applicable State of Idaho groundwater quality standards (i.e., maximum contaminant levels) in the SRPA (DOE-ID 1999, p. 8-2).

Table 4-1. Risk-based remediation goals for OU 3-13 soils.

Contaminant of Concern	Soil Risk-Based Remediation Goal or Single COCs (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

4.2 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 1-3, Phase I 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 is made available to better define the assumptions.

- Soil with contaminant concentrations exceeding the ROD-specified soil RGs at depths less than 10 ft bgs will be removed and managed as waste.

- Soil with contaminant concentrations remaining at or below 10 ft bgs that cause the ROD-specified groundwater RGs to be exceeded will be evaluated for further remediation and institutional controls.

- All contaminated waste generated from the Group 3 soils remediation will be disposed of at the ICDF.

- All ICDF operations, including stabilization and debris treatment, will be available for use.

- Boxes containing debris will be treated (microencapsulated), if required, at the Staging, Storage, Sizing, and Treatment Facility (SSSTF). Following treatment, the waste will be disposed at the ICDF.

- Soil/debris box labels are accurate and will be used to segregate soil waste from debris waste.

- Remote operations will not be 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.

- Field screening techniques are available to provide data to support field operations in determining that remediation has achieved the ROD RAOs. Cs-137 will be used as an indicator of soil contamination.

- Excavations used in removing the Group 3 soils will not require the use of enclosures.

- No basalt excavation or cleaning will be required.

4.3 Applicable or Relevant and Appropriate Requirements

The OU 3-13 ROD separated the ARARs for the selected remedy for the Group 3 Other Surface Soils into action-specific, chemical-specific, and to be considered requirements. Table 4-2 identifies the substantive requirements of the ARARs and the to-be-considered requirements and presents the strategies to be employed to comply with these requirements.

Table 4-2. Group 3, Other Surface Soils, ARARs and compliance strategy.

Alternative/ARARs Citation	Description	Relevancy[a]	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 RA 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 have been modeled. Based on the modeling, the remediation activities will be in compliance in with the applicable requirements. The modeling results are included in Attachment 2 to this Work Plan. Air emissions will be monitored during excavation, and dust suppression measures will be used as necessary, as indicated above.
40 CFR 61.92, 61.93 "Emission Monitoring"	National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Radionuclides from DOE Facilities, Emission Monitoring, and Emission Compliance	A	Radionuclide emissions generated from the remediation activities have been modeled. Based on the modeling, the remediation activities will be in compliance in with the applicable NESHAPS requirements. The calculated emissions are included in Attachment 2 to this Work Plan. 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 and securing the tarps, and work controls during high winds.
40 CFR 122.26	Storm water discharges during construction	A	The Clean Water Act jurisdiction on the INEEL is currently being reconsidered by DOE, EPA, and the Army Corps of Engineers (reference: CNN 43268, Clean Water Act Jurisdiction on the INEEL-OCC-03-049). Until a decision is reached regarding continued operation of the site Storm Water Pollution Prevention Program, storm water control requirements will be met during excavation and disposal through engineering controls.
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 (WMP).
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 SSA 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 and the location will be provided to the Agencies with a 5-day comment period.

Table 4-2. (continued).

Alternative/ARARs Citation	Description	Relevancy[a]	Compliance Strategy
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.
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 1999).
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 FSP, RD/RA WMP, 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.
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 WAC.
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 WAC. The ICDF WAC accounts for both the PCB and radionuclide content.
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.

Table 4-2. (continued).

Alternative/ARARs Citation	Description	Relevancy[a]	Compliance Strategy
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. 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.

4.4 DOE Documents

The following DOE site-specific documents are used as the basis for the remedial design of the Group 3, Other Surface Soils sites:

Final Record of Decision for the Idaho Nuclear Technology and Engineering Center, OU 3-13 at the Idaho National Engineering and Environmental Laboratory, DOE/ID-10660, Rev. 0, U.S. Department of Energy Idaho Operations Office, October 1999.

Remedial Design/Remedial Action Scope of Work for Waste Area Group 3, Operable Unit 3-13, DOE/ID-10721, Rev. 1, U.S. Department of Energy Idaho Operations Office, February 2000.

Operable Unit 3-13, Group 3, Other Surface Soils, Prioritization and Site Grouping Report, DOE/ID-10996, Rev. 0, U.S. Department of Energy Idaho Operations Office, September 2002.

ICDF Complex Waste Acceptance Criteria, DOE/ID-10881, Rev. 1, U.S. Department of Energy Idaho Operations Office, July 2003.

Waste Acceptance Criteria for ICDF Landfill, DOE/ID-10865, Rev. 3, U.S. Department of Energy Idaho Operations Office, July 2003.

Waste Acceptance Criteria for ICDF Evaporation Pond, DOE/ID-10866, Rev. 4, U.S. Department of Energy Idaho Operations Office, August 2003.

4.5 Engineering Standards

The remedial design was developed based on the latest engineering standards. The construction specifications, when released, will contain references to the latest engineering standards and the specifications to which they apply. The design drawings are included in Appendix B of this plan.

4.6 Status of Record of Decision Assumptions

The general assumptions made in the OU 3-13 ROD, Section 8, Remedial Action Objectives, for INTEC land use assumptions used to develop the RAOs remain valid and are listed below:

1. The INTEC facility will be used as an industrial facility up to the year 2095. During the period of DOE operations, expected to last to at least 2045, this area is a radiological control area.

2. Only the contaminated groundwater present in the SRPA outside of the current INTEC security fence is addressed in this ROD. The selected remedy is expected to fully address the contamination. However, this action does not address groundwater inside the current INTEC security fence, which will be addressed under OU 3-14.

3. For the time period 2095 and beyond, it is assumed that the SRPA located outside the current INTEC security fence will be used as a drinking water supply.

4. The annual carcinogenic risk at INTEC from natural background radiation due to surface elevation and background soil radiological contamination is 10^{-4} (EPA 1994, NEA 1997, UNEP 1985).

5. Permanent land use restrictions will be placed on those release site source areas and the ICDF complex, which will be closed in place, for as long as land use and access restrictions are required to be protective of human health and the environment.

There are no ROD site-specific assumptions related to the Group 3 sites.

4.7 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 (QA/QC) protocols that will be used for this project. Where applicable, the project specifications give the QA/QC procedures for a given task, consistent with guidance provided in applicable company procedures and the safety category designation.

4.8 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. As part of the remedial design development, several potential uncertainties have been analyzed and an approach developed to manage each uncertainty. The uncertainties identified and the strategies for managing them are outlined below:

- Waste stream profile development:
  - The uncertainty associated with the development of the waste stream profiles for acceptance by the ICDF prior to the generation of a waste stream will be largely eliminated by additional characterization sampling per the Characterization Plan (Attachment 3). This sampling activity is intended to fill the current data gaps in existing sampling information.
- Unexpected design changes:
  - The uncertainty associated with the extent of contamination prior to the start of RA activities will be largely eliminated by additional characterization sampling per the Characterization Plan (Attachment 3). This sampling activity is intended to confirm the existing remedial design depths through waste stratification and concentration data.
  - Available data for Sites CPP-37A, -37B, and -37C indicate that COC concentrations are below the soil RGs. These sites will be further characterized and defined by the phased characterization approach (Attachment 3). This additional sampling is intended to provide more complete data for WAG 3 management to make decisions regarding remedial design changes, if necessary, to meet ROD requirements. If design changes are necessary, they will be incorporated in a revision to this document.
- Unexpected/undetected underground utilities (e.g., pipes):
  - INTEC has a program of maintaining updated drawings on underground utilities and structures. There is the possibility, however, that some underground utilities and structures drawings were not "Red-Lined" or "As-Built" following construction and might not be in the exact location and/or physical configuration as shown on the engineering drawings. Subsurface surveys and interviews with facility personnel will be used to identify underground utilities prior to the start of remediation activities at each site.
- Unexpected contamination (location and type):
  - The uncertainty associated with finding waste in unexpected locations (outside the existing established boundary) and/or finding waste types not previously encountered and/or sampled and profiled will be largely reduced by additional characterization sampling per the Characterization Plan (Attachment 3).
  - The strategy for handling unexpected wastes or contamination during excavation activities at the remediation sites is discussed in Section 5.4 of this Work Plan.
- Weather delays:
  - The Idaho high plateau region is known for its adverse weather and cold long winters; thus, the field activities are scheduled for the spring and summer. The potential for a wet spring or summer might impact excavation activities, but it is expected that these delays or impacts to the schedule would be minor.

4.9 Identification of Unresolved Issues

Four 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 RA described herein.

4.9.1 High-Level Waste

As a result of the U.S. District Court for Idaho's judgment, the schedule for the remediation of CERCLA sites contaminated with high-level waste (HLW) may be impacted due to uncertainties associated with the management of these waste streams.

4.9.2 ICDF Landfill WAC Limits

Based on existing knowledge, some of the waste streams generated by this project will exceed the ICDF WAC limits. If waste is found to exceed the ICDF landfill or evaporation pond WAC limits, this waste will be managed in accordance with the Waste Management Plan (WMP), see Table 3-1.

4.9.3 LDR Compliance and Treatment for U134 Waste Code

As specified in the OU 3-13 ROD, wastes associated with specific Group 3 CERCLA sites must meet the land disposal restrictions (LDRs) prior to disposal. This includes contaminated soils removed from the proximity of the tank farm (e.g., CPP-92, 97, 98, and 99). These CERCLA wastes have been identified as having EPA listed hazardous waste numbers, including U134, due to their contact with wastes associated with the INTEC PEW liquid waste system. U134 is a listed hazardous waste due to the corrosivity and toxicity of hydrogen fluoride and is associated with unused commercial chemical products and off-specification species and spills thereof. U134 is also associated with secondary waste streams that come into contact with, or are derived from the treatment of a waste source assigned the U134 EPA hazardous waste number. However, nonliquid secondary waste streams that contain no free liquids do not meet the RCRA definition of being corrosive (per 40 CFR 261.22). As a result, requiring nonliquids to be treated in accordance with the 40 CFR 268.40 treatment standard (i.e., NEUTR) for U134 nonwastewaters for purposes of land disposal is inappropriate. The INEEL is currently pursuing relief from the U134 treatment standard from the Idaho Department of Environmental Quality, in accordance with the State of Idaho's HWMA's process. If granted, the CERCLA program will implement any relief from the U134 treatment requirement.

4.9.4 Potential Conflict Associated with Schedule for Remediation of CPP-03

Currently, spent nuclear fuel casks on railcars are being stored on the rail spur running through site CPP-03. Due to the need to remove the railroad track within site CPP-03 during remediation, coordination activities with the Spent Nuclear Fuels 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.

5. REMEDIAL DESIGN

This section describes the remedial design for the Group 3, Phase I remediation sites. This design was developed in accordance with the engineering design basis presented in Section 4. This section also includes a description of the characterization activities required to identify additional data necessary to make decisions regarding the RAs for the Group 3, Other Surface Soil sites. Additionally, the RAO implementation strategy, design approach, and the strategy for handling unexpected waste are described herein. The design drawings for the construction activities are included in Appendix B.

5.1 Waste Characterization

The Characterization Plan (Attachment 3) identifies additional data required to make decisions regarding the RAs for the Group 3, Other Surface Soil sites. The following are additional data requirements:

1. Determine whether sites require remediation.

2. Ensure that adequate data are available for each site to complete a waste profile for disposal of the waste

3. Determine if those wastes requiring remediation, for which I-129 is suspected, can be placed in the ICDF landfill.

5.1.1 Data Gaps

The existing data, summarized in Section 3 and Appendix A of this Work Plan, have been evaluated for each site to address the three data needs identified above. The following data gaps were identified from this review.

5.1.1.1 CPP-97. Process knowledge indicates that the source of the CPP-97 waste is from the releases associated with the tank farm and WCF condensate. Recent radiological surveys have defined the lateral extent of Cs-137 contamination at this site and indicate that concentrations exceed the ROD-defined RGs for Cs-137 and Sr-90. The existing data are insufficient to complete a waste profile, and additional characterization data are needed for organics, inorganics, and radionuclides. Additional data are also required to determine the mass of I-129.

5.1.1.2 CPP-92. Process knowledge indicates that the source of much of the CPP-92 waste is from the tank farm. Existing data indicate that contaminant concentrations exceed the RGs for Cs-137 and Sr-90, but are insufficient to complete a waste profile. Therefore, additional characterization data are needed for organics, inorganics, and radionuclides. Additional data are also required to determine the mass of I-129.

5.1.1.3 CPP-98. Process knowledge indicates that the source of the CPP-98 debris waste is from the tank farm. Some radiological data exist from surveys of the tank farm soils stockpiled at CPP-97 that are associated with the wooden shoring. All contaminant data from CPP-97 will be applied to CPP-98 debris, including I-129. No sampling is required because the waste boxes only contain debris.

5.1.1.4 CPP-99. Process knowledge indicates that the source of the CPP-99 waste is from the tank farm and the CPP-604/605 excavation. Some radiological data exist from surveys of the tank farm soils stockpiled at CPP-97 that are associated with the wooden shoring. However, because there are little radiological or chemical data for this site, insufficient data exist to determine whether RGs are exceeded or to complete a waste profile. Therefore, additional characterization data are needed for organics, inorganics, and radionuclides. Additional data are also required to determine the mass of I-129. A determination will also be necessary for the box currently characterized as "unknown contents" in order to classify the contents as soil or debris. This box will be opened at the ICDF Complex and classified by visual inspection.

5.1.1.5 CPP-37B. The following excerpt is from Section 5.3.3.18, CPP-37b, Gravel Pit and Debris Disposal Pit 2, of the OU 3-13 ROD (DOE-ID 1999):

> Modeling and sampling of the site indicated the site is not a significant contributor to groundwater risk or surface exposure risk. However, since the pit was previously used as a landfill, characterization is considered insufficient to recommend no further action at the site.

Based on this data assessment, the existing CPP-37B data are insufficient to determine whether RGs are exceeded at this site. Previous sampling did not analyze for Eu-152 and Eu-154. Therefore, additional characterization data are needed to determine if remediation of this site is necessary.

5.1.1.6 CPP-37C. There are insufficient data or process knowledge for Site CPP-37C to define the extent of contamination or determine whether RGs are exceeded. Therefore, characterization data are needed to determine if remediation of this site is necessary.

5.1.1.7 CPP-03. Cs-137 concentrations at CPP-03 exceed the RG. Data or process knowledge is sufficient to complete a waste profile. Waste at this site is associated with releases from the tank farm and WCF condensate and no previous I-129 sampling has been done. Analytical results from I-129 verification sampling at Site CPP-34A/B will be used to determine the level of verification sampling for I-129 at CPP-03. If the verification sampling at CPP-34A/B shows that I-129 is below detection limits, no additional I-129 sampling will be required for CPP-03.

5.1.1.8 CPP-37A. Previous characterization sampling and process knowledge indicate RGs were not exceeded for the soil COCs. Even though Eu-152, -154, and Pu-241 were not analyzed for; Cs-137 will be used to scale these constituents. The 95% UCL estimates for these values were developed using the ICDF design inventory. Comparing the estimated values with RGs indicates that even if concentration estimates were significantly higher than reasonably expected (several orders of magnitude), the values would still fall below the RGs.

Since all COC values were found or reasonably assumed to be significantly lower than RGs, Site 37A does not require further remediation.

5.1.1.9 CPP-67. The RGs for Cs-137 and mercury were exceeded in samples from SWP-1. The RG for Cs-137 was exceeded in SWP-2, and I-129 concentrations exceeded the ICDF landfill WAC concentration guidelines. The existing data are sufficient to complete a waste profile. Sufficient data exist for I-129 in SWP-1 and SWP-2. Therefore, only verification sampling will be performed per the Characterization Plan (Attachment 3).

5.1.1.10 CPP-34A/B. The RGs for Cs-137 and Sr-90 were exceeded for at least one depth at all four-sample locations at Site CPP-34A/B. Existing data are sufficient to complete a waste profile. Since I-129 was not detected in any of the samples and process knowledge indicates it would not be found in detectable concentrations, only verification sampling will be performed per the Characterization Plan (Attachment 3).

5.1.2 Applicable Hazardous Waste Codes

Since the actual characterization data for the soil in boxes and in the CPP-97 stockpile will not be available by the completion of this Work Plan, it is not known if treatment of these soils will be necessary to meet the ICDF WAC. At the time the OU 3-13 ROD was developed, Sites CPP-92, -97, -98, and -99 were determined that to require compliance with applicable LDRs prior to disposal. The following codes are associated with wastes derived from the PEW liquid waste system:

- F001 - (carbon tetrachloride; 1,1,1-trichloroethane; trichloroethylene)
- F002 - (carbon tetrachloride; tetrachloroethylene; 1,1,1-trichloroethane; trichloroethylene)
- F005 - (benzene, carbon disulfide, pyridine, toluene)
- U134 - (hydrofluoric acid).

5.1.2.1 CPP-97. The soil at Site CPP-97 will be sampled as described in the Characterization Plan to determine if it meets the alternative LDR treatment standards for contaminated soil (40 CFR 268.49).

5.1.2.2 Soil in Boxes. The majority of boxes in Sites CPP-92 and CPP-99 are documented in IWTS database as containing soil (>50% soil by volume). For these boxes, the Characterization Plan segregates the boxes into three groups for sampling purposes based on radiation readings: (1) boxes containing soil ≤5 mR/hr, (2) boxes containing soil >5 mR/hr and ≤ 50 mR/hr, and (3) boxes containing soil > 50 mR/hr. Each group of boxes will be sampled to determine if the waste meets the alternative LDR treatment standards for contaminated soil and to obtain other data necessary to complete the waste profiles. Soil boxes with contaminant concentrations that do not meet LDRs will be shipped to the ICDF for treatment and disposal. Treatment will be performed as described in the SSSTF Process and Treatment Overview for the Minimum Treatment Process (EDF-ER-296). The delivery of these boxes to the ICDF is considered the RA for these sites.

5.1.2.3 Debris in Boxes. For boxed waste at Sites CPP-92, -98, and -99 containing primarily debris (i.e., greater than 50%), the material inside the boxes will be grouted (i.e., microencapsulated). Microencapsulation is an accepted alternative treatment standard for hazardous debris (40 CFR 268.45). The treatment will be performed at the SSSTF at ICDF as described in the SSSTF Debris Treatment Process Selection and Design (EDF-1730, 2002). For these boxes, the RA will consist of delivering the boxes to the ICDF.

5.1.3 Extent of Soil Contamination

The lateral extent of soil contamination is defined by physical boundaries for several sites (e.g., the boxed soil sites, CPP-97, CPP-03, CPP-67, and CPP-34A/B) and by existing sampling data for others (e.g., CPP-37A and 37B). The lateral and vertical extent of soil contamination at Site CPP-37C, however, is undefined. Additionally, the suspected presence of contaminated debris at CPP-37B and 37C is unconfirmed.

The Characterization Plan presents a three-phased sampling approach to define the extent of contamination for sites CPP-37B and CPP-37C. The first phase consists of a geophysical survey (ground penetrating radar) conducted to look for disturbed areas and buried objects (e.g., debris at CPP-37B and CPP-37C) and to better define the lateral boundaries of Site CPP-37C. Sampling will be performed in the second phase, with sample locations selected based on the results of the geophysical surveys. The sample locations will be biased to avoid boring into debris or sampling in areas where sufficient data already exist. The third phase will be the excavation of test pits/trenches in areas where the geophysical survey results indicate the possible presence of debris. These test areas will be excavated to no greater than 10 ft below grade (the lateral dimensions will be determined based on the survey results), and the debris will be extracted and analyzed using gamma spectroscopy to determine its disposition. This high-resolution, in situ germanium spectrometer field measurement system consists of a high-purity germanium detector mounted 1 m (3 ft) above the ground on a tripod. A 1.0-in.-thick collimator can be used to shield the detector from possible sources of shine, or background radiation, as necessary. Proper system operation is monitored throughout the fieldwork to ensure accuracy of the measurements. The data obtained from this characterization effort will be also used to assist in the preparation of waste shipment documents and to develop design drawings where necessary.

5.1.4 Characterization Results Summary

The characterization sampling and analytical results described above will be submitted to the Agencies under two different submittals. The first submittal will be the Characterization Results Report for Remediation Set 1. This report will present the validated analytical data for the sampling of Sites CPP-92, -97, -98, and -99. This report will be an informal deliverable, no formal review cycle is planned.

The second submittal will be the Characterization Results Report for Remediation Sets 2 & 3. This report will present the validated analytical data for the sampling of Sites CPP-37B and -37C, This report will provide results showing that at Sites CPP-37B/C remediation may or may not be required and present the path forward for remediation of all the sites, as necessary. This will be a secondary document, subject to the standard FFA/CO review cycle for secondary documents. The schedule dates for submittal of both these reports are provided in Table 6-1 and in Appendix D.

5.2 Remedial Action Objective Implementation Strategy

The following strategy was developed to implement the RAOs for the Group 3, Other Surface Soils remediation as specified in the OU 3-13 ROD and summarized in Section 4.1 of this Work Plan.

5.2.1 Design Excavation Depths

The design excavation depths shown in the design drawings (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 all detected soil COCs were below the RGs. Where data were available at multiple depths for a given site, the excavation depth was determined by selecting the *first* sampled depth where all COCs were below the RGs. Table 5-1 presents the design excavation depth and its basis for each remediation site. The basis for additional characterization sampling for each site is discussed in Section 5.4.

5.2.2 Contamination Below Design Depth

As discussed in Section 4, Design Basis, residual soil contamination greater than soil RGs below 10 ft could pose a risk to groundwater. The ROD declaration 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 regrade."

If contamination greater than the soil RGs is encountered following initial excavation to the design depth, the flow chart in Figure 5-1 is used to determine whether soil contamination has been removed to a level that is protective of human health and the environment. To the design depth, the RGs identified in Table 5-2 are the action levels (Boxes 1-7 from Figure 5-1) as specified in the OU 3-13 ROD (DOE-ID 1999). Once the excavation has reached the design depth, only hot spots are excavated up

Table 5-1. Design excavation depths.

Site	Design Excavation Depth (ft)	Comments
CPP-92, -98, -99	NA	Soil/debris is containerized in waste boxes in a CERCLA waste storage area. No subsurface contamination.
CPP-97	0.5	No sampling data available at depth. Gamma-spectrometry survey data indicate Cs-137 >RG in surface soils.
CPP-34A/B	20.0	Sites were excavated to 20 ft then backfilled with waste soil. Cs-137 and Sr-90 >RGs at 14-16 ft bgs. Recommended excavation depth is based on risk associated with contaminants >RGs up to 10 ft bgs and risk to groundwater associated with residual contamination below 10 ft bgs.
CPP-37A	0	No COCs > RGs at any sampled depth, **no remediation required for this site.**
CPP-37B	TBD	No COCs > RGs at any sampled depth. If characterization sampling verifies no COCs >RGs, then **no remediation required for this site.**
CPP-37C	TBD	No COCs > RGs for any samples. If additional characterization sampling verifies no COCs > RGs, **then no remediation required for this site.**
CPP-67 Pond 1	2.0	Cs-137 and Hg > RGs at 0-0.5 ft bgs. No contaminant data available from 0.5-2.0 ft.
CPP-67 Pond 2	2.0	Cs-137 > RG at 0-.5 ft bgs.
CPP-03	2.0	Cs-137 > RG at 0-0.5 ft and 0.5-1.5 ft.

NA – not applicable.

TBD – to be determined.

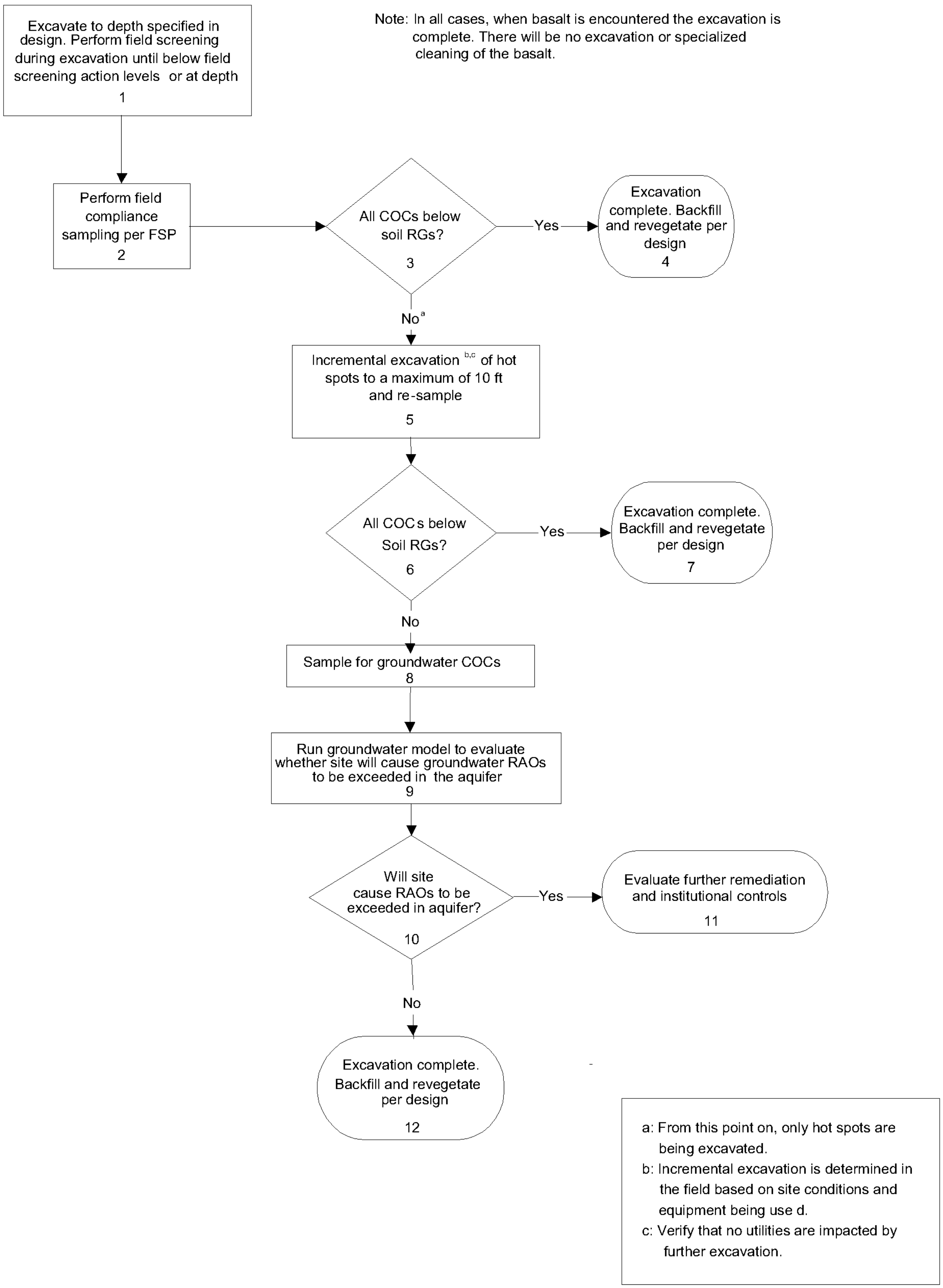

Figure 5-1. Excavation strategy flow chart.

Table 5-2. Snake River Plain Aquifer remediation goals.

Contaminant of Concern	SRPA Remediation Goals (Maximum Contaminant Levels) for Single COCs[a]	Decay Type
Beta-gamma emitting radionuclides	Total of beta-gamma emitting radionuclides shall not exceed 4 mrem/yr effective dose equivalent	Beta-gamma
Sr-90 and daughters	8 pCi/L	Beta
Tritium	20,000 pCi/L	Beta
I-129	1 pCi/L[b]	Beta-gamma
Alpha-emitting radionuclides	15 pCi/L total alpha-emitting radionuclides	Alpha
Uranium and daughters	15 pCi/L	Alpha
Np-237 and daughters	15 pCi/L	Alpha
Plutonium and daughters	15 pCi/L	Alpha
Am-241 and daughters	15 pCi/L	Alpha
Nonradionuclides		
Chromium	100 μg/L	Not applicable
Mercury	2 μg/L	Not applicable

a. If multiple contaminants are present, use a sum of the fractions to determine the combined COCs remediation goals.
b. Derived concentration if only beta-gamma radionuclide present.

to 10 ft below grade. If the excavation reaches 10 ft below grade and soil contaminant concentrations are still above the RGs, additional samples will be collected and analyzed for the SRPA COCs shown in Table 5-2 and Tc-99. A groundwater model, such as GWSCREEN, will then be run using the analytical results to determine the risk posed to the aquifer by the residual soil contamination (Boxes 8-9).

The GWSCREEN model uses a mass conservation approach to calculate the limiting soil concentration that, after leaching and transport to the aquifer, will not result in exceeding the groundwater RGs. Further discussion of the application of the groundwater model and subsequent sampling are discussed in the FSP (Attachment 1). If groundwater modeling indicates the site would cause a maximum contaminant level exceedance, the site will be evaluated for further remediation and maintaining institutional controls (Boxes 10-12). As noted, in all cases when basalt is encountered, the excavation is complete. There will be no excavation, specialized cleaning, or RAO verification sampling of basalt.

5.3 OU 3-13, Group 3, Other Surface Soils, Remediation Sets 1-3, Phase I

This section describes the design approach for remediation of the Phase I sites. Descriptions of the Title II design drawings for the Phase I remediation are identified in Table 5-3 and found in Appendix B.

Table 5-3. Title II Design drawing list for OU 3-13 sites.

General	All Sites	T-1	INTEC Area Map	Shows INTEC Site and OU 3-13, Group 3, Other Surface Soils, Remediation Sets 1-3 locations
		T-2	Drawing Index	Drawing index and general notes
Remediation Set 1	CPP-92, -98, -99	C-1	Remedial Set 1	Area map and haul routes
		C-2	CPP-92, -98, -99	CPP-1789 plot plan and boxed soils inventory of boxes
	CPP-97	C-3	CPP-97 Enlarged Plan	Boundaries and estimated quantities
Remediation Set 3	CPP-34A, -34B, -03, and -67	C-4	Remediation Set 3	Area map and haul routes
	CPP-34A	C-5	CPP-34A Demolition Plan	Demolition of existing fencing and roadways and estimated quantities
	CPP-34A	C-6	CPP-34A Finish Plan	Final configuration of fences, roadways, ditches, etc.
	CPP-34B	C-7	CPP-34B Demolition and Finish Plans	Demolition of existing fencing and roadways and estimated quantities/final configuration of fences, roadways, ditches, etc.
	CPP-34A/34B	C-8	CPP-34A/-34B/-37A Excavation Sections	Sections and excavation profiles
	CPP-67A - Pond 2 CPP-67B - Pond 1	C-9	CPP-67A/-67B Demolition Plan	Demolition of existing fencing and roadways and estimated quantities
	CPP-67	C-10	CPP-67A/-67B Finish Plan	Final configuration of fences, roadways, ditches, etc.
	CPP-67	C-11	Stockpiles 1 and 2 plan	Plot plans and contours and quantities
	CPP-67	C-12	CPP-67A/-67B Excavation Sections	Sections and excavation profiles
	CPP-03	C-13	CPP-03 Demolition Plan	Demolition of existing fencing and roadways and estimated quantities
	CPP-03	C-14	CPP-03 Finish Plan	Final configuration of fences, roadways, ditches, etc.
	CPP-03	C-15	CPP-03 Excavation Sections	Sections and excavation profiles
	CPP-34A/34B	C-16	CPP-34A/34B Bypass Road	Plot Plans
	CPP-34A/34B	C-17	CPP-34A/34B Bypass Road	Road & Ditch Sections/Details and Fencing Details
	CPP-03	C-18	CPP-03 Site Photos	Site photos
	CPP-67	P-1	CPP-67 Piping Plan	Demolition of waste piping
	CPP-03	E-1	CPP-03 Electrical Plan	Demolition of electrical duct bank
	CPP-03	E-2	CPP-03/-603 Partial Plan	CPP-603 electrical demolition plan

The estimated excavation and backfill volumes for all sites to be remediated, except for CPP-92, CPP-98 and CPP-99 (boxed soil sites), were calculated using TERRAMODEL computer software. EDF-3778, Earthwork Quantities for OU 3-13, Group 3—Other Soils Project presents the estimated quantities for excavation and backfill. This Engineering Design File (EDF) is included in Attachment 5.

5.3.1 Remediation Set 1—Remediation of Soil Piles and Boxed Soils and Debris

This section describes the general remedial design for Set 1. Site-specific details are noted on the design drawings for each site (Appendix B).

5.3.2 Site CPP-97

This section outlines the activities designed for removal of the soil piles and surface contaminated soils associated with Site CPP-97

5.3.2.1 Utilities and Surface Features. Rerouting of existing utilities will not be required since there are no utilities located at this site. The only surface feature to be removed is the site boundary fence.

5.3.2.2 Excavation and Removal of Contaminated Soils. The excavation of Site CPP-97 involves the removal of the two soil stockpiles (including liners) and the excavation of the contaminated surface soil within the site boundary to a depth of 6 in. The estimated volume of soil from the stockpiles is 1,474 yd^3. The estimated volume of contaminated surface soil is 955 yd^3.

5.3.2.3 Confirmation Soil Sampling. The confirmation soil sampling strategy is described in detail in the FSP (Attachment 1). Following remediation of the site, an initial radiological survey will be performed with a gamma spectrometer for Cs-137, followed by hot spot removal, if necessary, and a resurvey and final confirmation sampling of the excavated surface to ensure compliance with RAOs.

5.3.2.4 Backfill Operations and Site Restoration. The site will be backfilled with pit-run gravel. The estimated volume is 955 yd^3. Contouring and grading of backfill excavation will be performed to maintain existing surface water patterns or as designated in design drawings.

5.3.3 CPP-92, -98, -99 Sites (Soil and Debris Boxes Stored at CPP-1789)

This section describes the activities designed for removal of the boxed soils and debris.

5.3.3.1 Utilities and Surface Features. Rerouting of existing utilities will not be required at these sites since no utilities have been identified. There will be no surface features to be changed since this site is located within the CERCLA SSA (CPP-1789) and will not be closed as part of this SOW.

5.3.3.2 Removal of Contaminated Soils. CPP-92, -98, and -99 sites are soil and debris waste that is boxed and stored at the SSA, and the boxes are to be transported to ICDF for disposal and/or treatment to meet LDRs. There are a total of 830 wooden boxes for the three sites. The identification number and size of each of the boxes is included in Appendix A.

5.3.4 Remediation of Contaminated Surface Soil Sites

This section describes the general activities designed for remediation of the contaminated soil sites in Set 3. Site-specific details will be noted on the design drawings for each site. This design includes rerouting of existing utilities, demolition of surface and subsurface features, contaminated soil excavation, removal of any residual contamination below the sites, and restoration and revegetation (if applicable).

There is no remedial design presented in this RD/RA Work Plan for Sites CPP-37A, -37B, or -37C, as these sites will undergo a staged approach to characterization and remediation based on existing sampling data. The need for remediation of these sites will be based on data gathered under the Characterization Plan (Attachment 3). If analyses indicate contaminant concentrations exceed the RGs, this Work Plan will be revised to incorporate a design to remediate these sites.

5.3.5 Remediation of Set 3

5.3.5.1 Utilities and Surface Features. Rerouting of existing utilities and surface features will be required at all Set 3 sites requiring remediation. Activities at these sites will primarily be limited to protecting existing utilities while modifying surface features.

Remediation of Site CPP-34A/B will require removal and replacement of the animal fence, security ditch, the east perimeter road, and the installation of a new bypass road.

Remediation of Site CPP-67 will require demolition of Buildings CPP-1611 and CPP-1612, fencing, and several concrete slabs. Well SWPP-23 will be abandoned and removed. Additionally, portions of the service waste line and redundant service waste line will be cut, capped, and removed.

Remediation of Site CPP-3 will entail demolition of approximately 560 ft of railroad ties and rails, an electrical ductbank and sections of the pavement on Willow Avenue and the road east of Building CPP-603. Additionally, the conduit and wiring inside the ductbank to the termination point inside CPP-603 will be removed.

5.3.5.2 Excavation and Removal of Contaminated Soils. The excavation required for the Remediation Set 3 sites involves the removal of the subsurface contaminated soils within each site's boundaries. Design excavation depths vary from 2 ft at CPP-67 and CPP-03, to 20 ft at CPP-34A and CPP-34B. Design excavation depths were developed based on existing sampling data and could change following additional characterization.

The estimated contaminated soil excavation volumes for each of the Set 3 sites to be remediated are as follows:

CPP-34A/B	=	60, 949 yd^3
CPP-67 Ponds 1 and 2	=	29,885 yd^3
CPP-03	=	5,835 yd^3.

5.3.5.3 Confirmation Soil Sampling. The strategy for performing confirmation soil sampling is described in detail in the FSP (Attachment 1). Following remediation of the site, an initial radiological survey will be performed with a gamma spectrometer for Cs-137, followed by hot spot removal, if necessary, and a resurvey and final confirmation sampling of the excavated surfaces.

5.3.5.4 Reinstallation of Utilities and Surface Features. The reinstallation of utilities and surface features is required at Sites CPP-34A/B and CPP-03. Site CPP-34A/B will require replacement of the animal fence, security road, and security ditch. Site CPP-03 requires repaving of the Willow Avenue and the road east of Building CPP-603. It also will require reinstallation of a derailer outside of the area.

5.3.5.5 Backfill Operations and Site Restoration.

Backfill operations and site restoration are required at all Set 3 sites. Site CPP-34A/B requires importing and backfilling the excavation with approximately 46,000 yd^3 of pit run gravel to match the existing surface contours.

Site CPP-67 will require importing approximately 29,000 yd^3 of backfill material from the adjacent stockpiles to the south of the existing ponds. The ponds will not be backfilled; however, the side slopes will be shaped to a 4:1 slope. Approximately 10,000 yd^3 of topsoil will then be placed over the pond surfaces and side slopes in a 6-in. lift. Revegetation of the ponds will complete remediation of this site.

Site CPP-03 will require importing and backfilling the excavation with approximately 6,000 yd^3 of pit run gravel to match the existing surface contours.

5.4 Strategy for Handling Unexpected Waste

This section provides the logic for addressing additional contamination encountered during implementation of the Group 3, Other Surface Soils RAs. Unexpected contamination may be discovered by visual observation during excavation activities as well as during operational screening or sampling and/or sampling for verification and QA activities that will be performed as part of the ICDF waste acceptance process. The decision process outlined in Figure 5-2 provides the logical approach to addressing additional contamination when it is encountered during excavation. Two potential scenarios are presented:

- Same COCs with additional contamination (larger excavation required) and/or same COCs with higher concentrations of COCs

- Additional contamination with different contaminants (different source of release).

It is recognized that various combinations of these scenarios could likely occur. The approach suggested in this section provides flexibility to remediate as much of a site as is practicable. The highlights of the decision process are as follows:

- If the additional contamination encountered consists of the same COCs but at higher concentrations or greater volumes than documented in the waste profile, the new waste will be compared to the Group 3 contaminants (Box 3) and the ICDF WAC (Box 5). The final extent of the excavation and the levels of contaminated soil excavated and shipped to the ICDF will be documented in the RA report.

- Risk-based soil cleanup action levels (Box 4) (for contaminants without ROD RGs) may be obtained from other INEEL RODs or from the Region IX soil-screening guide.

- If the additional contamination consists of different COCs than those currently listed in the waste profile, the existing waste profile will be revised. If this new waste meets the ICDF WAC, the excavation will continue and the specifics of the new contamination and extent of excavation will be documented in the RA report (Boxes 5, 7, and 8).

- If the additional contamination does not meet the ICDF WAC, then discussions with the Agencies will be conducted to determine the path forward for the additional waste (Boxes 5 and 6).

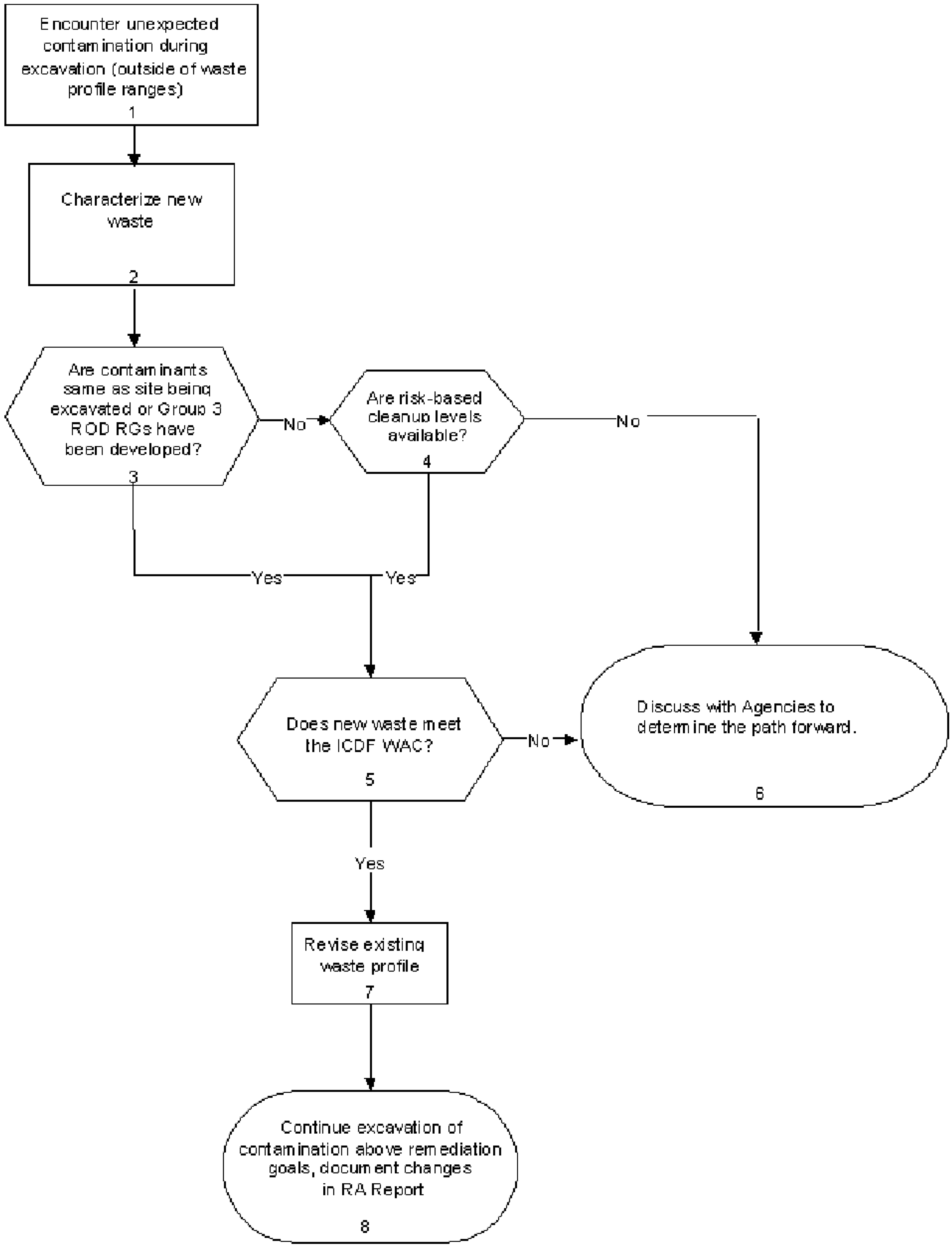

Figure 5-2. Decision process for addressing unexpected contamination.

The HASP (Attachment 4) and radiological work permit will each have stop work triggers for unexpected conditions and well-defined procedures for resuming the work. It is assumed that unexpected contamination will occasionally trigger these stop work procedures. This discussion is not designed to address restart issues relating to worker health and safety or radiological control but is intended to provide guidelines to address the issue of encountering unexpected contamination and provide a path forward.

Most conditions of unexpected contamination should be able to be addressed by continuing the excavation until RGs or risk-based levels of contamination are reached. The changed conditions and final excavation are then documented in the RA report.

6. REMEDIAL ACTION WORK PLAN

This section presents the approach to conducting the Group 3, Other Surface Soils site remediations, including the construction work elements, the associated detailed schedule, and the documentation required at completion of the RAs.

6.1 Relevant Changes to the RD/RA SOW

The RD/RA strategies for completing remediation of WAG 3 were summarized in the OU 3-13 RD/RA SOW (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 SOW. Changes to the described scope are minor. In the RD/RA SOW description of the Prioritization and Site Grouping Report, it was assumed that the Group 3 sites would be grouped into approximately five sets. The final Prioritization Report resulted in six sets of sites to be remediated in two phases (DOE-ID 2002a). A letter from DOE to EPA and IDHW[d], documented the following approach to phasing remediation of the Group 3 sites:

- Phase I of the Group 3 RD/RA Work Plan will address Remediation Sets 1, 2, and 3 as described in the Group 3 Prioritization and Site Grouping Report (DOE-ID 2002a).
- As identified in the Prioritization and Site Grouping Report, the remediation sites identified in Sets 1, 2, and 3 are higher in priority for remediation than the sites in Sets 4, 5, and 6 based on the six criteria described in the report. Additionally, the end-state cleanup plans for the facilities located near the Set 4, 5, and 6 remediation sites are currently under consideration. Phasing will also allow better integration of INTEC Environmental Remediation, D&D, and other programs (HLW, SNF, RCRA) cleanup/closure activities.
- The proposed approach is to submit the Draft Group 3 Phase I RD/RA Work Plan to the Agencies no later than August 30, 2003, meeting the enforceable milestone date identified in the WAG 3, OU 3-13 RD/RA SOW. Remediation activities would then begin upon final approval of the Phase I RD/RA Work Plan in accordance with the FFA/CO review cycle for a primary document. The schedule is provided in Appendix C of this plan.
- The remedial design for Sets 4, 5, and 6 will be addressed in the Group 3 Phase II RD/RA Work Plan. The submittal of the Draft Phase II RD/RA Work Plan to the Agencies is October 31, 2007, with finalization expected in early 2008. This date is an enforceable milestone under the FFA/CO.

The RD/RA SOW also noted that because these RAs were not anticipated to require extensive engineering design, the remedial design would consist primarily of excavation plot plans and cap designs. The plot plans were to illustrate the planned extent of excavation, exclusion zones, and support facilities. The cap designs were to delineate the areas to be capped, and include cross-sections and specifications (Section 4.3.3.3 of the RD/RA SOW). It was determined in the prioritization report that installation of individual caps is not cost effective and does not add to risk reduction efforts. Therefore, there are no cap designs in this RD/RA document.

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d. 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.

6.2 Remediation Implementation Plan and Procurement Strategy

The work elements composing this RA consist primarily of sampling (including analysis and validation), earthwork (including excavation of soils associated with the Phase I remediation sites), construction of roads and fences, and demolition of utility lines and structures.

The anticipated implementation strategy for the Phase I activities is described below for each activity:

1. Characterization sampling for the Set 1 sites is anticipated to be performed by INEEL labor forces. Sample analysis and validation will be managed through the INEEL SAM organization.

2. Characterization of the Set 2 and 3 sites is anticipated to be performed by subcontractors. The INEEL's procurement process will be followed and will include, but is not limited to, issuance of a Request for Proposal (RFP), prebid conference, bid evaluation, notice of award, and notice to proceed.

3. Remediation of Sites CPP-92, -98, and -99 from Set 1, consisting of transporting the waste boxes from the SSA to the ICDF Complex, is expected to be performed by INEEL labor forces or the existing ICDF Complex with Stoller Corporation.

4. Remediation of Site CPP-97 and Set 3 will be performed under the existing ICDF Complex subcontract with Stoller Corporation. INEEL project personnel will provide project and technical oversight to ensure that the requirements designated in this RD/RA Work Plan are met and that remediation is accomplished per the provided schedule.

5. Demolition and construction of roads, fences, structures and piping is anticipated to be performed by subcontract. The INEEL's procurement process for a competitive bid will be followed. INEEL project personnel will provide project and technical oversight to ensure that the RD/RA requirements designated herein are met.

6. RAO verification sampling and analysis for all Phase I remediation sites will be performed by INEEL labor resources. Sample analysis and validation will be managed through the INEEL SAM organization.

Although this approach represents the current implementation strategy for the remediation of the Phase I activities, changes to this approach may occur, at which time the Agencies will be notified.

6.3 Remedial Action Work Elements

The following sections identify and describe the work elements required to implement and complete the remediation of the Group 3, Other Surface Soils sites. All work will be performed in accordance with the approved HASP (Attachment 4) 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 RA consist of site characterization, followed by earthwork, including excavation of soils and rerouting and demolition of utility lines. The activities to be performed will be discussed first for the sites requiring excavation. Descriptions of specific activities to be performed at the stockpiled soils and boxed soil/debris sites will follow.

6.3.1 OU 3-13 Site Areas Additional Characterization—General Sequencing

The OU 3-13 site areas additional characterization operations are sequenced in Steps 1 through 6. These sequencing steps are subject to change based upon the detailed sequencing submitted by the subcontractor performing the work:

- Step 1 - Site mobilization
- Step 2 - Establish site survey controls and grids
- Step 3 - Perform additional characterization sampling
- Step 4 - Handle, package, label waste
- Step 5 - Ship waste to certified laboratory
- Step 6 - Site cleanup and demobilization.

These steps are further outlined and detailed in the Characterization Plan (Attachment 3). Once the laboratory analyses have been completed, verified, and validated, the information will be used to further assess those remediation sites sampled for modification of existing remediation design and/or remediation approach (no remediation required).

6.3.2 OU 3-13 Site Areas Excavation—General Sequencing

The OU 3-13 site area excavation, waste removal, mass backfill, final grading and contouring, and final site restoration or revegetation operations are sequenced in Steps 1 through 12. These sequencing steps are subject to change based upon the detailed sequencing submitted by the subcontractor performing the work. These steps are outlined below:

- 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 - Mass excavation
  - Step 5a - Excavation of OU 3-13 site area limits to design depths or 10 ft bgs
  - Step 5b - Iterative excavation and soil screening to meet RGs or 10 ft below design excavation limits
- Step 6 - Final field verification sampling of excavation
- Step 7 - Placement of excavation into stable condition waiting for sampling laboratory analysis
- Step 8 - Mass backfill operations

- Step 9 - Installation of final permanent utilities/structures
- Step 10 - Final grading and contouring/placement of finish grade gravel or placement of topsoil and revegetation
- Step 11 - Removal of decontamination areas/fencing/and other temporary construction
- Step 12 - Demobilization from site.

The sites that will undergo mass excavation operations are CPP-97, -34A/B, -03, and -67 (Evaporation Ponds 1 and 2).

Requirements for vendor data submittals, training, and medical information specified by the construction specifications and INEEL-specific requirements will be provided in the RFP. The subcontractor will provide required documentation, bonds, insurance, and proof that all required training and medical examinations are complete as per the HASP (Attachment 4) before the subcontractor will be allowed to mobilize. These submittals will certify that the subcontractor can meet and satisfy the requirements of the RFP and the project.

6.3.2.1 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 lay down 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 contractor, subcontractor, 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.

6.3.2.2 Establishment of Perimeter Fencing and Site Boundary (Step 2). Temporary security barriers and/or fencing and access-control fencing will be installed to restrict access by wildlife or unauthorized personnel into the work area and to prevent drilling and heavy equipment from driving over subsurface structures. 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 HASP (Attachment 4) under security fencing.

6.3.2.3 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 be delineated after the award of the remediation subcontract and will use the best available technology to provide adequate decontamination of equipment and transport vehicles while minimizing the generation of secondary waste streams. The location of the decontamination areas will be provided to the Agencies for a 5-day review/comment period.

6.3.2.4 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 isolated and demolished as shown on design drawings to allow the excavation to be completed to the required depth to meet the RGs. Once the remediation has been accomplished, these utilities will be reinstalled as shown on the design drawings prior to and/or in conjunction with backfill operations.

6.3.2.5 Mass Excavation (Step 5). Field screening using a gamma spectrometer will be performed during the excavation. The flow chart presented in Figure 5-1 will be followed for determining when the excavation is complete. Note that there will be no excavation into basalt.

The general sequencing of mass excavation activities is as follows:

- Excavation will typically proceed in 1-ft lifts (to minimize the excavation quantities while removing contamination greater than the RGs and to minimize placement of noncontaminated materials that could be used for backfill materials into the ICDF landfill) (Step 5a).
- 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 liner or dump trucks with solid formed dump bed (designed to avoid leakage of materials) will be loaded by the tracked 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 dry 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 or transport trucks will transfer the waste soil and debris to the ICDF, where ICDF Operations will review the waste manifests, accept the truck, and dispose of the waste.
- Field screening and contamination removal accomplished by additional excavation of hot spots to the preestablished 10 ft bgs or design depth is an iterative process that must be worked dependent upon field conditions (Step 5b).
- 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 Stormwater 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 and plastic 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.

6.3.2.6 Final Field Verification Sampling and Geophysical Survey of Excavation (Step 6). The final field verification sampling will be performed to verify that RGs have been met as described in the FSP (Attachment 1). The excavation will be surveyed to establish backfill material needs.

6.3.2.7 Placement of Excavation into Stable Condition Waiting for Sampling Laboratory Analysis (Step 7). The excavation will be placed into a safe and stable configuration to allow the excavation to remain open until the final field compliance sample results are verified and validated (a period of 30-90 days depending upon certified laboratory backlog and schedule).

6.3.2.8 Mass Backfill Operations (Step 8). Following verification that the RGs have been met, the excavation will be backfilled. Backfill will be placed and compacted to meet the requirements for future use of the site.

6.3.2.9 Reinstallation of Structures/Equipment (Step 9). Structures and facility equipment 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.

6.3.2.10 Final Grading and Contouring/Placement of Finish Grade Gravel or Placement of Topsoil and Revegetation (Step 10). Final grading and contouring of the site topography as required by the design drawings and placement of topsoil and revegetation of those sites requiring such (Site CPP-67) will be performed.

6.3.2.11 Removal of Decontamination Areas/Fencing/and other Temporary Construction (Step 11). 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 WMP (Attachment 6).

6.3.2.12 Demobilization from Site (Step 12). Site cleanup and demobilization will include completion of the final site punch-list, removal of equipment, and reposting of the site boundary.

6.3.3 Remediation—Boxed Waste Transfer Operations

The sites that will undergo boxed waste transfer operations are CPP-92, -98, and -99. These waste boxes are currently located in the SSA. These boxes are in good physical condition and are currently inspected weekly under the Agency-approved Waste Management Plan for the Staging and Storage Annex (DOE-ID 2003). This remedial operation will be fairly simple and straightforward, consisting of transporting boxed waste from SSA to the ICDF. This is a routine waste handling operation, and existing procedures are in place to cover such work.

The general sequencing of operations for this RA is outlined below:

- Presorting of the boxes will be conducted prior to collecting additional characterization samples.
- Additional characterization samples will be collected and analyzed per the Characterization Plan (Attachment 3).
- Waste profiles will be developed and a determination made regarding ICDF WAC acceptability and/or applicability for stabilization to meet LDRs.
- Soil and debris waste boxes will be transferred to ICDF for direct disposal and/or to SSSTF within the ICDF Complex for treatment, as necessary. The specific sequencing of operations associated with the transfer of the soil and debris waste boxes to the ICDF from the SSA is outlined below:
    - A site boundary of sufficient size will be established to allow staging/loading of a transport trailer and tractor unit at the SSA.

- A forklift with sufficient capacity will be used to move boxes from the SSA and load them onto the tractor-trailer unit. Loading will be limited by weight loading restriction on the tractor-trailer unit.

- The load will be tied down and secured to the trailer unit and a final radiological survey performed for release.

- The tractor-trailer unit will be driven from the SSA to the ICDF Complex where it will be weighed and directed to the staging area to drop off the trailer and boxes.

6.4 Decontamination

At the completion of the remediation activities at each site, exposed surfaces of equipment used for excavation and management of contaminated soil or debris will be dry decontaminated at designated decontamination areas in each work zone. Brushing and wiping will be used to remove contaminated soil until the contamination has been removed. If simple brushing and wiping cannot remove the contamination, decontamination of heavy equipment to be used for all sites may be performed at the ICDF decontamination facility if necessary. Generally, dry decontaminated equipment will be moved from site to site on trailers, with final decontamination at ICDF to occur at the end of the project. Radiation and contamination surveys will be performed to determine if adequate decontamination has been performed to enable the release of equipment for reuse.

All decontamination wastes will be disposed at the ICDF. If the decontamination of equipment requires wet decontamination efforts, these will be accomplished at the SSSTF located in the northeast corner of the ICDF.

6.5 Field Oversight/Construction Management

The NE-ID remediation PM will be responsible for notifying the EPA and IDEQ of project activities such as project startup, closeout, and inspections. The NE-ID remediation PM will also serve as the single interface point for routine contact between the Agencies, the WAG 3 PM, and the INEEL management and operations contractor.

The INEEL management and operations contractor will provide field oversight and construction management services for this project. The INEEL management and operations contractor will also provide field support services for health and safety, radiological control, environmental compliance, quality assurance, and landlord services. An organization chart and position description is provided in the HASP (Attachment 4).

6.6 Project Cost Estimate

The project costs are estimated to be $12.1 million. The project cost estimate is provided in Appendix D.

6.7 Project Schedule

The RA working schedule for Group 3 is presented in Appendix C and includes the project tasks from the finalization of the Phase I RD/RA Work Plan (Remediation Sets 1-3) through performance of the RA and submittal of the Phase I 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 6-1 shows the targeted activities associated with the Group 3 Other Surface Soils Remediation Sets 1-3 (Phase I) removal project. In addition, the schedule identifies the preparation of the Draft Phase II (Remediation Sets 4-6) RD/RA Work Plan and the enforceable milestone date for submittal of that draft document.

6.8 Inspections

Upon completion of RA activities for each site in Remediation Sets 1, 2, and 3, a prefinal inspection will be performed at the discretion of the Agency PMs or designees. Periodic inspections can occur at any time during remediation activities and will be conducted to finalize all project work elements. The inspection will establish compliance with the RD for each site, the remediation activities outlined in this RA Work Plan, and with all requirements outlined therein.

6.8.1 Prefinal Inspection

Prefinal inspections are performed by the Agencies or their designees typically at the completion of the RA construction activities to determine the status of those activities and to identify outstanding construction requirements and actions necessary to resolve any issues identified. The prefinal inspection will occur following backfill and site restoration of all the sites. Results from the prefinal inspection will then determine the date for the Phase I Completion Report. However, due to the number of remediation sites, interim inspections may be performed by the Agencies or their designee, at their discretion, for each remediation site.

6.8.1.1 Prefinal Inspection Checklist. A prefinal inspection checklist will be developed for the prefinal 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 RA

Table 6-1. Summary of major Group 3 activities, future reports, and the primary enforceable milestone.

Group 3 Activities	Target Date	Enforceable Milestone
Submit Characterization Results Report for Rem. Set 1	September 8, 2004	--
Submit RAO Validated Results Report for Rem. Set 1	January 11, 2006	--
Submit Characterization Results Report for Rem. Set 2	March 6, 2006[a]	--
Submit RAO Validated Results Report for Rem. Set 3	Various[b]	--
Perform Prefinal Inspection for Phase I	May 7, 2008	--
Submit Phase I Completion Report	September 3, 2008[a]	--
Submit Phase II Draft RD/RA Work Plan to Agencies	October 31, 2007	Yes

a. Secondary document.

b. RAO confirmation sampling results for the individual Remediation Set 3 sites will be transmitted to the Agencies upon receipt of validated data.

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 proposed prefinal inspection checklist is included in Appendix E.

Results of all inspection(s) will be documented in the Phase I prefinal inspection report, which will be issued as a letter report and will contain the following elements:

- The names of all inspection participants.
- Specific project elements/hold points that were inspected.
- Completed prefinal inspection checklist documenting the performance of the inspection and all 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 prefinal inspection.
- Date of final inspection (if required).

6.8.1.2 Prefinal Inspection Report. The completed prefinal inspection checklist will be included as an attachment to the Phase I Completion Report. The Phase I prefinal inspection elements will be finalized in the context of the Phase I and II final inspection report (if required) or the RA Report. The schedule for conducting the prefinal inspections and submitting the report is included in the overall schedule for each RA.

6.8.2 Final Inspection Report

A final inspection will be scheduled for and conducted at the completion of the RA for all of the Phase I and Phase II sites. The Agency PMs will determine the need for a final inspection based on the results of the two prefinal inspections. The final inspection will verify the closure of open items from the prefinal inspections and will confirm and document that the RGs have been met.

A final inspection report will be prepared following the completion of the Phase II RAs and their associated prefinal and final inspection processes. The final inspection, conducted by the Agency PMs, will confirm the resolution of all outstanding items identified in the prefinal inspection and verify that the remediations has been completed in accordance with the requirements of the OU 3-13 ROD (DOE-ID 1999).

6.9 Phase I Remedial Action Completion Report

The Phase I Remedial Action Completion Report for the Group 3, Other Surface Soil sites will be prepared following remediation of all of the remediation sites, currently scheduled for 2008. This report will include the following:

- A synopsis of the remediation work defined in this RD/RA Work Plan and certification that this work was performed

- Explanation of any modifications to this RD/RA Work Plan, including the purpose for and the results of the modification
- Discussion of issues encountered during remediation and their resolution
- Brief description of outstanding items from the prefinal inspection, as documented in the Prefinal Inspection Report
- Discussion of the results of the prefinal inspection
- As-built drawings showing final contours and configurations
- Final total costs of the Phase I RA.

The Phase I Completion Report will be a secondary document, subject to the standard FFA/CO review cycle for secondary documents.

6.10 Remedial Action Sampling and Analysis

The sampling and analysis to be performed to verify that each site meets the RGs is described in detail in the FSP (Attachment 1). As discussed previously in Section 5.2, Remedial Action Objective Implementation Strategy, and shown in Figure 5-1, if, after reaching the design depth, soil RGs have not been met, an iterative sequence of excavation and resampling of hot spots will be performed to a maximum of 10 ft below grade.

The results of the RAO confirmation sampling for the Phase I remediation sites will be submitted to the Agencies upon completion. The results for Sites CPP-92, -92, -97, -98, and –99 (Remediation Set 1) will be submitted together. The results for Remediation Set 3 will be transmitted by individual site. The submittals will include the validated data for each respective site and will be transmitted via a letter; no formal review cycle is planned.

6.11 Waste Management and Tracking

Management of wastes generated from these remediation activities are addressed in the WMP (Attachment 6). The WMP provides identification of each waste stream, describes waste minimization actions, and provides requirements for waste tracking, storage, and ultimate disposal. The WMP describes the waste to be generated, waste minimization, waste characterization strategy, on-Site management and disposition, and off-Site disposition.

6.12 Health and Safety

A site specific HASP (Attachment 4) has been prepared to provide safety guidance applicable to all project personnel. The HASP provides oversight, construction management support, and sampling activities for the RA. The HASP is a working document and will be reviewed and modified accordingly as the project planning documents are developed and finalized. The HASP 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 INEEL procedures and systems to implement the HASP 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.

6.13 Spill Prevention/Response Program

A separate Spill Prevention and Response Plan is not necessary to implement the RAs for the Group 3, Other Surface Soil sites. In the event of a spill, the INTEC emergency response plan referenced in the HASP will be activated. All 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.

6.14 Other Procedures Relevant to RA Activities

No procedures other than those identified in this RD/RA Work Plan and its supporting documents have been identified as required for performance of the Group 3, Other Surface Soils remedial actions. If additional requirements are identified at a later time, they will be included in the appropriate project documentation.

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 5-year review (DOE-ID 1999). If, at the time of the first OU 3-13 INTEC 5-year review, contaminants remain in the Group 3, Other Surface Soils sites above levels that allow for unlimited use and unrestricted exposure, the sites will be included in the OU 3-13 INTEC Five-Year Review to assess the protectiveness of existing controls. 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 5 years as part of the OU 3-13 INTEC 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 5-year review that institutional controls and 5-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. REFERENCES

40 CFR 261.22, 2003, "Characteristic of corrosivity," *Code of Federal Regulations,* Office of the Federal Register, July 2003.

40 CFR 264.310, 2002, "Standards for owners and operators & 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.

40 CFR 268.40, 2003, "Applicability of treatment standards," *Code of Federal Regulations,* Office of the Federal Register, January 2003.

40 CFR 268.45, 2003, "Treatment standards for hazardous debris," *Code of Federal Regulations,* Office of the Federal Register, January 2003.

40 CFR 268.49, 2002, "Alternative treatment standards for contaminated soils," *Code of Federal Regulations,* Office of the Federal Register, July 2002.

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